

Preschool Education in Virginia and the Resulting Academic Effects

for Third- and Fifth-Grade At-Risk Students

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Preschool Education in Virginia and the Resulting Academic Effects for Third- and Fifth-Grade

At-Risk Students

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Abstract

While there remains little doubt that the “founding” preschool programs in America—the High/Scope Perry Program, the Chicago Child-Parent Centers, and the Abecedarian Project—had a positive academic and social impact on the students they served, such claims are difficult to substantiate for students being served in the Virginia Preschool Initiative Program. This study was designed to investigate the educational impact of the state-funded preschool program on the academic achievement of at-risk students who attended school from 1999-2002. These students’ third- and fifth-grade Standards of Learning tests, in the subject areas of mathematics and reading, were compared using T-tests and ANOVA calculations to determine if there existed any statistically significant differences in academic achievement. Results from the investigation did not find any significant differences in achievement between those students who attended preschool and those who did not. In fact, reading scores were higher for those female students who did not attend preschool.

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Chapter I

Introduction

This nation decided early in our history that education would be one means of attaining social and economic justice. We have a long and rich history of publically educating all children, regardless of economic background, race or creed, for we tend to believe that education can be the great equalizer both economically and socially. Early proponents of education such as Thomas Jefferson, Horace Mann, John Dewey and other great educators understood, public schools do not *serve* a public so much as *create* a public. This creation of a public would be facilitated, primarily, by educating all students in the fundamental skills of mathematics, reading, and writing. However, beginning in the late 1800's the nation soon discovered that not all children enter school with the same educational background, economic resources, or parental involvement. As a result, a push toward leveling the field for children before entrance to public school was created: the concept of preschool.

Preschools, often referred to as *infant schools*, *early education schools*, and other names, have been a part of the American educational system since the early 1700s. Early settlers' young children, many of whose parents were illiterate, were taught the basic skills necessary to read the Bible. As the industrial revolution began in the United States, cities such as Lancaster, Pennsylvania and Boston, Massachusetts began offering preschool programs to help ensure that the influx of immigrant children arriving were given the necessary educational skills to enter the public school systems and thrive. In later years, as the United States entered World War I and II, preschools were enlarged not only to provide early educational opportunities for children, but to also provide child care to parents who were forced into the job market. During the civil rights

movements in the United States, preschool programs were publicized as being a means of leveling educational experiences and resources to those children who were traditionally seen as at-risk, primarily by virtue of race and poverty level.

With the inception of the No Child Left Behind legislation, preschools have once again entered the public debate and policy discussions as a way of preparing children for the rigors and educational expectations of public school. As these debates rage in our nation, several well-known studies are often cited and used by proponents of preschool education to strengthen their case.

Early childhood intervention programs such as the High/Scope Perry Program, the Chicago Child-Parent Centers, and the Abecedarian Project all demonstrated long-term benefits for children in areas such as overall health, cognitive development, school achievement, and lower rates of delinquency and crime (Reynolds et al., 2007). The majority of students served by these high-quality programs were at-risk students, identified, in some cases, from infancy (Abecedarian Program) or, as is more common, as three and four year olds. Although each of these cited programs served a relatively small group of students, when one compares the entire population of students who would have qualified for such services to the outcomes demonstrated by those who were given the opportunity to attend, there is little doubt that such programs did provide a social, moral and educational benefit for our society.

As a result of the positive educational and social benefits that these preschool programs provided, forty states have begun offering some version of the program. In several states the preschool offerings have taken the form of a collaborative partnership with private providers, such as religious organizations. For the purposes of this study, only those programs which are

funded through state educational monies and are under the direct supervision of the local school system were considered.

On Thursday, August 16, 2007, Governor Timothy M. Kaine announced the realignment of his preschool agenda for Virginia. This initiative, known as Start Strong, would expand and realign access and regulation of pre-kindergarten programs. The initiative would expand “high-quality” preschool for a larger population of Virginia’s four year olds. This expansion would potentially serve an additional 17,000 at-risk four year olds by the year 2012 (The current system serves about 12,500.) This increase would translate to approximately 67% of the states four year olds participating in either public or private preschool programs at a cost of roughly \$125 million annually. Kaine (2007) stated the following in his press release: “Increasing access to high-quality pre-school programs will mean that more of Virginia’s children are ready to learn when they enter kindergarten giving them a better chance for success throughout their K-12 experience” (Governor Tim Kaine, para. 3). The question, however, must be asked. Is Virginia’s state-funded program producing the same academic results as the three “founding” preschool programs have repeatedly established?

Statement of the Problem

Preschool education in Virginia has expanded at an exponential monetary, as well as, pupil rate. According to Governor Kaine’s website (2009), “When it is fully phased in, Start Strong will represent a \$90 million expansion of the current VPI program. The total state-funded preschool program will cost \$140 million, at full phase-in. The Governor’s proposal reaches that level in 2012” (Official Site of the Governor of Virginia, para. 12). While millions of dollars are being allocated to the Virginia Preschool Initiative, there remains little data with

regard to the educational gains, when measured by achievement on the third- and fifth-grade Standards of Learning tests, these children may or may not have made as opposed to their peers who did not attend preschool.

This research project seeks to establish whether or not a difference exists between the academic achievements of at-risk students who attended preschool and their at-risk peers who did not attend. Students who were selected to participate in the county's preschool program from 1999 – 2002 in three selected elementary schools were used as the first control group. Those at-risk students who did not attend preschool, but were class peers to those who did, served as the second control group. Students who moved out of the area or transferred to another local school were not included. A comparison of the results from the state Standards of Learning tests in reading and mathematics for third- and fifth-grade students was used as the assessment measure.

Statement of the Null Hypotheses

To achieve the purposes of this study, five null hypotheses were proposed:

1. There will be no significant difference in the third- and fifth - grade reading and mathematics Standards of Learning achievement test scores of at-risk students who attended preschool and those who did not.
2. In comparing gender differences, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk students who attended preschool and those who did not.
3. In comparing ethnic differences of the four predominant student populations—White, Black, Hispanic and Asian, there will be no significant difference in third- and fifth -

- grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
4. In comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
 5. In comparing school attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

Significance of the Study

Given the sheer amount of publicity and the amount of funding the Virginia Preschool Initiative is slated to receive, further study is needed to determine whether the stated goals for the program are being realized, specifically, increasing academic achievement for elementary students, particularly in mathematics and reading. In a time of ever-tightening budgets, programs funded both at the local and state level must be justifiable. As schools work to close the achievement gap, preschools are seen as one possible solution. According to Governor Kaine in a speech delivered on July 26, 2006,

Every year in Virginia, 26,000 students fail the 3rd grade reading SOL exam. Half of them go on to fail the reading SOL exam again in the 5th grade. And often the achievement gaps we see later on, on the SATs and other exams, are simply a continuation of this problem. As a rule, this early performance indicator – the 3rd grade reading SOL exam – is an accurate predictor of an individual's

future success, not just in school but throughout life. Too often, failing that test portends problems in school, time in the juvenile justice system and later in the criminal justice system and a life that falls short of its potential. Every year, 10,000 students between kindergarten and the 3rd grade have to repeat the school year. It cost taxpayers \$8,000 for every repeater, for a total of roughly \$80 million dollars a year (Official Site of the Governor of Virginia, p. 2).

However, in a 2007 report the Joint Legislative Audit and Review Commission stated there is some debate over the longer term educational gains for these types of programs. While the weight of evidence from key studies of many quality preschool programs indicate that they can produce “long-term positive effects on IQ scores, student achievement test scores, grade repetition, special education placement, high school graduation and delinquency” (2007, p. iii), further studies are necessary to determine whether these prove true for the students participating in the VPI program, specifically as it relates to achievement on the state Standards of Learning tests.

This proposal seeks to establish whether or not this state-supported program does indeed prepare at-risk preschool students to successfully pass the state standardized tests at a higher rate than their at-risk peers who did not attend preschool; if such findings are significant, then justification for such a program should be strengthened, particularly if the findings are significant for any sub-groups within the at-risk population, such as particular ethnic groups or gender groups. However, should no academic link be found between participation in these programs and academic achievement, one should question exactly what purpose these programs provide.

If the objective is not academic gains for students, then the clarification should be made as to what purpose these programs serve.

Overview of Methodology

The instrument used to measure achievement in this study was the Virginia Standards of Learning test in reading and mathematics, grade levels three and five. This is a standardized test given to all third- and fifth-grade students in the state at the end of the students' respective school year in order to measure proficiency in reading and mathematics as required under No Child Left Behind regulations (Standards, Assessment, and Accountability, 2009). According to a 2001 report presented to the Virginia Department of Education a KR-20 internal consistency reliability test was completed on the math and reading SOL tests given in the areas of math and English. Each formula KR-20 estimate is simply a statistical estimate of how each test question contributes to the overall score. It ranges from 0, no reliability, to 1, perfect. The reliability scores for the math and English tests ranged from .74 to .88. A score of 0-399 is considered *failing*, a score of 400 is considered *passing*, and a score of 500-600 is considered *passing advanced*. An independent t-test was used to determine if there is a statistically significant difference in the mean test scores of those students who attended preschool as opposed to those who did not. In addition, a t-test was used to compare the mean test scores of females vs. males. An ANOVA analysis was used to compare the four main ethnic groups represented: African American, White, Hispanic and Asian. Students' racial designation was listed according to the designation marked in the students' permanent records.

Definition of Key Terms

1. *At-Risk* - For the purposes of this study, *at-risk* was defined as a *child's eligibility to participate in the free and reduced lunch program*. The targeted school system has limited its preschool program to only those students who qualify for such services, additionally limiting the program to a first-come, first-served basis, thus resulting in some at-risk students having access while others do not. According to the Governor's Smart Start website, *at-risk* is defined as such:

In terms of funding allocation by the state, "at-risk" is viewed as those children eligible for free lunch, or up to 130% of poverty (for a family of four, an annual household income up to \$26,845). With the new preschool plan, this definition would change to include children eligible for free and reduced price lunch, or up to 185% of poverty (for a family of four, an annual income up to \$38,203) (Governor Tim Kaine, 2009, para. 6).

2. *Standards of Learning* - The SOL tests are defined by the Virginia Department of Education (2009) as:

The Standards of Learning for Virginia Public Schools describe the commonwealth's expectations for student learning and achievement in grades K-12 in English, mathematics, science, history/social science, technology, the fine arts, foreign language, health and physical education, and driver education. These standards represent a broad consensus of what parents, classroom teachers, school administrators, academics, and

business and community leaders believe schools should teach and students should learn.

Chapter II

Review of the literature

Overview

Virginia is just one of many states that has recently developed plans to either create or strengthen existing preschool programs. *Preschool* is defined as any group program for children under the age of five that provides children with the knowledge and social competencies necessary for success in public schools (Anderson, n.d.). As reported in the 2008 State Pre-school Yearbook by NIEER (*National Institute for Early Education Research*, p. 1) states enrolled nearly 1.4 million children in subsidized programs, making state-run pre-kindergarten the largest public preschool program. They further state, “In the United States today, more than 80 percent of all 4-year-olds attend some kind of preschool program. About half of those (39 percent of all 4-year-olds) are enrolled in some kind of public program (state pre-K, Head Start or special education), with the other half enrolled in a private program.”

Theoretical Framework

If we believe as a nation that education is the key to social and economic success in America, then equal access to and preparation for education become critical elements. Many educational, political, and parent organizations argue that preschool education can be the key to a more just educational start for all children, giving many at-risk children, in particular, the vital foundation they need to grow educationally, socially, and developmentally.

When the first formal preschool studies of the 1960s began, people spoke of breaking the cycle of poverty and inoculating children against failure. Schweinhart (2007, p.3), however, cautioned poverty and failure are more complicated than that. He did, however, also note that

results from these studies showed a good preschool program can provide children born into poverty with significant benefits.

Studies showed that those attending preschool had measurably more advanced social skills, cognitive development, and significantly higher literacy skills than those who did not. Those who tended to show the greatest gains were children from at-risk backgrounds.

In recent studies researchers have determined in language acquisition alone, at-risk children fall well behind their peers. Hart and Risley (2003) stated that in a 5,200-hour year, a preschool child will experience 11.2 million words in a professional family, 6.5 million words in a working class family, and 3.2 million words in a family receiving welfare. They anticipated that by age four a child of a welfare family will have acquired 13 million fewer words than the average working-class family. There is little doubt that this disparity will affect the child's ability to function academically in a school setting.

Preschool programs often fill a void: poor families have access to Head Start. Well-to-do families pay for quality preschools out of their pockets while many lower-middle class families whose children badly need the readiness skills cannot afford such programs. Universal preschool programs are often cited as filling this gap.

Many states, at least 40, offer some type of state-funded preschool program. Oklahoma offers "universal" preschool, which means that parents of all incomes have the option of sending their 4-year-olds to a state-sponsored preschool, with nearly 90% of all four-year-old children enrolled; Oklahoma boasts the largest state program. Oklahoma educators credit their preschool program with raising reading and math scores in the lower grades, and with raising the achievement of low-income children.

Additionally, investments in preschool programs are often credited as a monetary savings to society. Preschool programs such as the experimental Perry Preschool in Michigan, in which researchers followed the poor and minority children who attended that school well into adulthood produced a return investment of more than \$16 to society (in the form of lower crime and higher employment rates) for every dollar spent. Students who completed this program have fewer criminal arrests, higher earnings and property wealth, and greater commitment to marriage as adults.

However, not everyone is a preschool proponent. Numerous arguments center around the idea that families raise children better than institutions; preschool is so valuable today only because it serves as a partial substitute where family structures have deteriorated. Those who argue against preschool contend the solution is not to create better and stronger preschool programs, but rather increase services and resources to strengthen families. Critics contend that the Perry program spent much more time and money per child than most preschool programs, employed better teachers, and worked much more closely with parents.

Additionally, such organizations as the Home School Legal Defense Association believe parents are in the best position to educate their children. They contend that in the drive to ensure that children receive the best education, we are in danger of over institutionalizing them. They propose that a child will develop naturally if the parents give the child what he or she needs most in the formative years: plenty of love and attention. In this way, the brain can develop freely, and when the child is ready, he or she can begin formal schooling.

While debates continue as to the validity and necessity of preschool programs, there is little research on the direct correlation of academic achievement for at-risk children in Virginia

who have attended the Virginia Preschool Initiative Program. While a few studies have traced Virginia preschool students through third grade and measured reading achievement, few studies have looked at a direct correlation between attendance in the state preschool program and achievement on the state Standards of Learning Tests.

The purpose of this research design was to investigate whether or not the commitment Virginia has made to the Virginia Preschool Initiative has indeed resulted in higher achievement, as measured by the Standards of Learning tests, for the state's at-risk children.

Evolution of Preschool

Preschool education is certainly not a new idea in the United States; it has been referred to as several different titles and its' purposes have been varied throughout the history of the program. In our current educational system, our expectations for preschool education include such criteria as measurable educational goals, behavioral goals, support systems for parents, nutritional programs, and health care programs. However, this expectation has not always been the case. Schooling for young children, including those programs referred to as *infant schools*, *early education schools* etc., have served multiple agendas, including free child care for parents, biblical instruction, and economic intervention for at-risk children. Such an example of the earliest formal education for preschool children is provided by Bloch, Seward, and Seidlinger (2001, p. 11), who state, "In the 17th century...4-year-olds as well as older children were given training in reading the Bible by village elders or dames if their own parents were unable to do so." These earliest of programs focused primarily on reading comprehension using the Bible as the curricular foundation of the program.

The first documented, public school integrated, preschool programs were known as *infant schools*. Infant schools for children up to age 5 began appearing in Europe and the United States in the early 1800s. Since their inception, these infant schools were housed within the public schools setting and “were used to educate and to form good moral character in poor children, who were perceived to be lacking in those areas” (Bloch, Seward and Seidlinger, 2001, p. 11). It is interesting to note that children from wealthier families were either tutored at home or sent to private schools, thus strengthening the tradition of public preschools serving primarily those children who were considered economically disadvantaged.

One of the first such infant schools to officially open in America was championed by educator and chemist John Griscom in New York City in 1823. During the influx of immigrants and the resulting industrial boom, programs such as these were primarily created to help ease the effects of poverty, particularly for immigrant families, and to help provide childcare to the millions of parents entering the newly created job market (Clemmitt, 2005). While there is little evidence that these programs were academically motivated, they did help guarantee that young children were being supervised and fed by an adult, in addition to receiving some exposure to the culture and expectations of public education.

In Boston the integration of preschool into the public school systems for three and four year olds was guaranteed by law in 1817 and survived until the mid-19th century, with most preschool children following along to class with older siblings, if teachers didn't protest. In some reports, children as young as two were reported as attending school with older siblings. “Older children monitored and instructed younger children in the rudiments of reading...in addition the primary aims of these schools were to teach conformity, silence and obedience”

(Beatty 2001, p. A3). These Boston infant schools, referred to as Urban Lancaster Monitorial schools, would serve as models for cities throughout the rest of country. The City of Boston boasted of the new program's potential, saying, "A ray of millennial light has shone on us, and reveals a way in which poverty, with all its attendant evils – moral, physical and intellectual – may be banished from the world" (Clemmitt 2005, p. 697).

It is interesting to note that during this expansion in the establishment of preschool programs for the poor, interest – and perhaps envy – was spurred among middle-class parents who worried that their children might be at a "disadvantage because of the early schooling poor children were receiving...those poor children will assuredly be the richest scholars...why should a plan which promises so many advantages be confined to children of the indigent" (Clemmitt, 2005, p. 697). However, despite parents' envy of these programs, Beatty (2004, p. A3) states an 1830 petition to "formally incorporate infant schools into the Boston Public Schools was rejected by the Primary School Committee." Included in the opposition to the program were primary school teachers who stated that "infant school graduates were difficult to manage" and mental health specialists who argued that "excessive early stimulation was damaging to children" (2004, p. A3). As a result during the period of 1830 – 1870 most United States infant schools died out, due primarily, according to Clemmitt, to the "cult of domesticity" which encouraged mothers to care for their own children (2005, p. 698). Bloch et al. (2001, p. 12) attribute the decline of preschool programs to the following: "According to the elite and education reformers of the day the proper place for young children to be educated was at home." The authors refer to this as the new romantic conceptions of childhood. These opinions were shared by other influential educationalists such as Samuel Woodward, who warned of the "dangers of confining children

under the age of eight in school for more than one hour at a time, because intensity might lead to precocity, which was a morbid condition of the brain that might lead to epilepsy, insanity or imbecility” (2001 p. 12).

Despite its decline from the public’s view and support, preschool education returned. The early 1900s brought a new call to action by social reformers who raised new alarms about the dangers of urban poverty for young children (Clemmitt, 2005). These reformers successfully pushed for the creation of free kindergarten and day nurseries. As a result of their efforts, President Theodore Roosevelt urged Congress to establish a federal office to promote children’s welfare in 1909, and in 1912 President William Howard Taft successfully created the Children’s Bureau, the first federal agency dedicated to children’s welfare.

As Beatty (2004, p. A4) points out, despite these movements in the early 1900s by United States Presidents to educate young people, “it took national emergencies to spur the federal action for younger children.” During the Great Depression, the Works Progress Administration sponsored Emergency Nursery Schools for three and four year olds; however, this program was created primarily as a job program for adults, with the hope of the federal government that the local public schools would absorb and fund the continuation of the programs. However, just as had happened in Boston a century earlier, few school systems were hospitable to the idea of funding preschool programs. With the onset of World War II, federal money was made available for preschools under the Lanham Act in the form of Children’s Centers, many of which stayed open twenty four hours a day in order to care for the “Rosie the Riveter’s children” (2004). Once again the hope was that these programs would be integrated into the public school system;

however, President Truman cut the funding six months after the war ended, again dooming the preschool program (2004).

Clemmitt (2005) states that the next foray into preschool education took place in 1962 in the town of Murfreesboro, Tennessee, with the creation of The Early Training Project. This project enrolled 65 low-income African-American children. These children's IQ scores improved by five to ten points at the conclusion of the program, and officials began talking of using the program as a model for a federal preschool initiative.

As a result of the heralded outcomes of The Early Training Project, new psychological research on the benefits of early education by J. McVisker Hunt of Brown University and the University of Chicago's Benjamin Bloom and the federal government's war on poverty, President Lyndon B. Johnson launched Head Start in 1965. Beatty (2004, p. A4) states, "Head Start survived inflated expectation about raising IQ scores and resistance from some southern states over integration to become an iconic community action program."

Head Start opened in the summer of 1965 as an eight-week program serving more than 500,000 children ages 3-5. By 1969 some Head Start centers were operating year round, and by 1972 most had moved away from the summer program to a year-round format (Clemmitt, 2005). Unlike other public education programs in the United States which are funded and run by the states, Head Start programs are locally run but funded directly by federal grants. Since the founding of the federal preschool program, Head Start has provided comprehensive services such as health care and parenting education, as well as the creation and funding of such programs as *Sesame Street*, an iconic children's television series. As part of this preschool expansion, Walter Mondale and John Brademas proposed the Comprehensive Child Development Act of 1971.

Beatty (2004, p. A4) points out that this proposal is the “closest the United States has come to getting a federal commitment to universal preschool education.” The act, which passed both houses of Congress, was vetoed by President Nixon “on ideological grounds, raising the specter of the Sovietization of the private family “(p. A 4). Despite this setback Head Start continued to grow and expand. The 1970s and 1980s brought about new regulations, including a requirement that at least 10 percent of Head Start’s national enrollment consist of disabled children, new initiatives to train and certify Head Start staff, Program Performance Standards, and bilingual and migrant Head Start Programs (Clemmitt, 2005). Beatty (2004, p. A5) states,

despite this frustrating record of fits and starts, evidence of the developmental benefits and cost-effectiveness of quality preschool education still mounts.

Advocates have continued to press for change, most successfully at the state and local levels, where most policy experts agree the impetus for universal preschool education must come, with hopes for increased federal funding.

States have experienced varying levels of success, and preschool regulations and programs vary greatly by state. According to Beatty (2004, p. A 5), “As of 2002, 40 states had some manner of publicly funded preschool programs, most targeted at children from low-income families but many inching toward universal models.” She goes on to point out that according to a 2004 study by the Trust for Early Education, there has been a 17-percent increase in children attending preschool since 2001.

States have pursued the goal of high-quality early education using different strategies. Over a decade ago, then Governor Zell Miller launched Georgia’s Voluntary Universal Pre-K Initiative; by 1998 it was funding preschool for nearly half of the state’s four year olds. In

Florida a unique citizen's initiative achieved passage of a constitutional amendment requiring high-quality pre-K for every four year old (Beatty, 2004). Oklahoma now offers preschool in its public schools through the state education budget thanks to bipartisan support. Oklahoma leads the country in pre-k enrollment with 70% of all four year olds, regardless of income, enrolled in a preschool program (Herrod, 2007). The state of New Jersey's Supreme Courts in the *Abbott v Burke* case legislated universal preschool in 30 school districts (Peebles-Wilkins, 2007). When creating its state program, the legislature of Arkansas stated, "Low-income children who receive high-quality early care and education score significantly higher on tests of reading and mathematics from their primary years through middle adolescence" (Education Law Center, n.d., p. 2). In establishing the Department of Early Learning in 2006, the state of Washington acknowledged, "The early years of a child's life are critical to the child's healthy brain development and that the quality of care giving during the early years can significantly impact the child's intellectual, social and emotional development" (n.d., p. 2) Programs in the states of South Carolina, West Virginia, and Michigan have also been recognized by the U.S. Department of Education as highly effective preschool programs.

Considerations

There is little doubt that high-quality preschool programs for at-risk students contribute positively to students' future academic, economic, and societal success. Researchers have now recognized that "early childhood experiences, both positive and negative can affect the physical, mental, behavioral, and economic well-being of the child" (Herrod, 2007, p. 203). Children who have received services in one of the previously discussed programs excelled beyond their peers in nearly every criterion, from higher graduation rates to lower criminal rates.

However, in order for preschool programs to be most effective, they must provide services at the earliest feasible age. Borman (2001) contends, to be most effective, programs for preschool must start at an early age in order to capitalize on the malleability of young minds and help alter at-risk children's long-range developmental path before they diverge substantially from the more advantaged children in their peer group. In addition, Peebles and Wilkens (2007) note that in order to produce the most positive results, programs must also focus on the whole child with the inclusion of services for parents, such as mental health and or social work professionals.

Multiple studies have shown that children from poor families are at a greater risk of developmental delays and learning disabilities, have a larger prevalence of health issues and nutritional needs, perform below grade level, are more likely to drop out of school, and are at greater danger of being involved in criminal behavior (*Rhode Island*, 2002). In language acquisition alone, at-risk children fall well behind their peers. Hart and Risley (2003) state that in a 5,200-hour year, a preschool child will experience 11.2 million words in a professional family, 6.5 million words in a working class family, and 3.2 million words in a family receiving welfare. They anticipate that by age four a child of a welfare family will have 13 million fewer words than the average working-class family. There is little doubt that this disparity will affect the child's ability to function academically in a school setting.

This readiness for school is not only limited to a child's home experiences, such as exposure to words. Readiness also includes physical well-being, approach to learning (curiosity), social and emotional development, use of language, and general knowledge (Wright et. al., 2000). Given these noted areas of deficiency in at-risk children, there is little doubt, based

on the research results of preschool programs, that preschool education programs enhance students' readiness for formal education.

Cost Analysis

In addition to the social and educational benefits to the child, effective preschool programs are also a good economic investment. As an example, it is estimated that the children of the High/Scope Perry program saved taxpayers more than \$17.00 for every \$1.00 invested in the preschool program, or as Barnett concludes (1993, p. 503), "Based on a detailed description of the Perry Preschool program and the resources it required, the cost per child was estimated to be \$7,601 for one year and \$14,415 for two years...and yet the total benefit to society is approximately \$76,077 per student."

Barnett (1993, p. 506) theorizes that "most of the public benefits were due to reductions in crime, one of our most serious and intractable social problems." Masse (2002, p. 5) stated, "Findings of the benefit-cost analysis revealed that the program pays for itself when all benefits and costs are included in the analysis. The rate of return to the Abecedarian project ranged from 3 to 7%, depending on the benefit considered."

In a recent preschool education policy proposal Duncan, Ludwig and Magnusan, agreed with Barnett estimating (2007 p. 143)

that the annual cost of the instructional portion of the program, (preschool), would be about \$8,000, with child care adding up to another \$4,000. The program would fully subsidize low-income children's participation; high income parents would pay the full cost. The total cost of the proposal, net of current spending, would be \$20 billion a year.

Despite the cost savings to society it is doubtful that the implementation of any one of these preschool programs exclusively would provide the educational and social solution for which we are searching as a society for our most at-risk children.

Educational organizations must find an effective way to ensure educational success for all students, particularly for those students in the early elementary grades where reading and mathematics skill acquisition are critical. There is little doubt that most educationally advantaged children receive more education-relevant resources than most educationally disadvantaged students (Munoz, 2001). The key, then, is not how to level the playing field for all students, but rather how to lift those without *to* the playing field. It is likely that each community will need to, with the assistance of the federal and state governments, establish, maintain, and amend effective preschool programs that will meet the needs of their unique children and families.

Opposition

While there seems little doubt that preschool can be an advantageous setting for many students, there remains a fierce debate on whether or not preschool should indeed exist, and whether or not all students should be mandated to attend. There are many voices who contend that preschool education outside the home is neither desirous nor beneficial. For example Marcon (n.d.) warns against overly academic preschool experiences that introduce formalized learning experiences too early in our quest to improve students' lives. She contends that academically challenging students too soon may actually prove detrimental when children move into later grades, resulting in disinterest in school, higher discipline referrals, and discontent.

As an another example, Beatty (2004, p. A5) states, “Harking back to Richard Nixon’s ideological stance, libertarian Darcie Ann Olsen of the Goldwater Institute opposes universal preschool education as an intrusion of the nanny state into the private family.” Olsen goes on to state,

While Head Start was created to remedy some of the social inequalities visited upon low-income children, a significant body of research shows that formal early education can be detrimental to mainstream children. By attempting to teach the wrong things at the wrong time, early instruction can permanently damage self-esteem, reduce a child’s natural eagerness to learn and block a child’s natural gifts and talents.

Another area of concern comes from those citizens troubled over the intrusion of a government organization. They feel this intrusion denies parents the right to raise their own children, particularly at a young age. Rep. Sam Rohrer of Pennsylvania states what many who disagree with preschool programs believe. He contends that the preschool programs are expensive and inappropriately compete with the role of parents. In agreement with the previous sentiments Carrie Lukas (2006, p. 1) of the Goldwater Institute states, “Voters and policymakers should also consider if government should be in the business of educating children as young as two. Universal Preschool is another step in the creeping takeover of family responsibilities.” John Hood (2009, p. 1) from the John Locke Organization elaborates,

All these government initiatives to inoculate pre-schoolers against the ravages of poverty, delinquency, and education mediocrity have posted disappointing results.

It turns out to be exceedingly difficult to transform a few promising laboratory experiments into major state programs involving tens of thousands of people.

In addition to the aforementioned concerns the often-stated opposition to preschool is the apprehension about the effects of stress and poor quality programs on young children. Ironically, there are those who fear the stricter regulations on academic achievement in preschool, such as are contained within the No Child Left Behind. They contend that this legislation, which is putting pressure on preschools to institute higher academic standards and begin testing to formally assess mastery of these skills, will be detrimental to young children, placing them under too much stress. In opposition to these concerns are those who complain that “Head Start has been so intent on providing comprehensive services – including health care, parenting classes and nutrition...that it has neglected basics school-related skills, such as recognizing letters” (Clemmitt, 2005, p. 687).

Others believe that the Head Start program, as well as other federal and state supported preschool programs, can and should be maintained as productive programs with significant modifications, such as a public acknowledgement by the Congress that poor and minority children are still well behind their peers academically, despite enrollment in Head Start; more state governance over the Head Start program to allow integration into existing preschool programs; improvement plans that document better teacher training; more clearly articulated and aligned curriculum; more parent involvement; and the opportunity for children to attend preschool multiple years (Haskins, 2005).

Still others believe that the key to improving Head Start and other preschool programs lies in the training and hiring of teachers who hold a bachelor’s degree and training in early

childhood (Cohen & Ewen, 2008). While current legislation proposes to increase the number of teachers who hold degrees, many are concerned about the exodus of newly licensed teachers to more profitable careers, such as employment at the kindergarten level.

Founding Programs

Much of the impetus behind these initiatives is a result of the research from several notable studies; the High/Scope Perry Study, the Abecedarian Study, and the Chicago Child-Parent Center Pre-school Program (CPC) are among the most commonly cited. While the specific design of each program is slightly different, all strive “to enhance the school readiness of children at risk due to primarily economic disadvantage, so they can begin formal schooling on a more equal footing with their peers” (Ou & Reynolds, 2004, p. 176). Many economically at-risk students begin their formal education in school at a disadvantage. Nueman (2006) predicts on average, the cognitive scores of at-risk four year olds are 60% below their more affluent peers. For most, this pattern does not change throughout their career; they will continue to trail behind their more affluent peers academically, socially, and physically. Neuman goes on to state that “advantaged children read more, engage more in higher-level conversations, and use information for fulfilling specific purposes and needs. Disadvantaged students often avoid reading and other knowledge pursuits” (p. 28). This disparity in access to literature, higher level thinking skills, and challenging pursuits creates a gap in the readiness to attend school between these socio-economic groups which becomes increasingly difficult to close as children progress through school.

Though all high-quality preschool interventions boast gains in various areas throughout a child's school career, the following list compiled by the Bright and Early Commission (2007) summarizes the total gains of all interventions combined:

Fewer referrals for remedial classes or special education; fewer retentions; higher grades; greater social and emotional maturity; more frequent high school graduation/GED completion; greater academic motivation, on-task behavior, capacity for independent work, and time spent on homework; lower incidence of absenteeism/detentions; better attitudes toward school; better self-esteem, greater internal locus of control; lower incidence of teen pregnancy, drug abuse, and delinquent acts; more sports participation; high future aspirations, more postsecondary education; higher employment rates and better earnings and, correspondingly, a lower incidence on dependence on welfare; fewer arrests and antisocial acts; better relationships with family members, a high incidence of volunteer work (para. 4).

High/ Scope Perry Study

Perhaps the most famous and frequently referenced long-term study of preschool programs is the High/Scope Perry Study. Barnett (1993) states, "Begun in 1962, it is one of the strongest and best known longitudinal studies of the effects of preschool education on poor children" (p. 500). According to the High/Scope Educational Foundation, the goal of the preschool model is to enable young children to achieve greater school success, to attain adult socioeconomic success, and to develop social responsibility by giving them opportunities to initiate and engage in learning activities that contribute to their cognitive, affective, and physical

development. A consistent daily classroom routine is maintained and varies only if the children are given fair warning. The daily plan includes a “plan-do-review” sequence and as well as music, movement, and computers (Schweinhart, 2007).

A brief description of the original study is as follows:

This study examines the lives of 123 children from 100 African American families born in poverty and at high risk of failing in school. From 1962-1967, at ages 3 and 4 the subjects were randomly divided into a program group that received a high-quality pre-school program based on the High/Scope’s participatory learning approach, (58 total students), and a comparison group who received no pre-school program, (65 total students). Students attended a half-day program for two years. Project staff collected data annually on both groups from ages 3 through 11 and again at ages 14, 15, 19, 27 and 40. In the study’s most recent phase, 97% of the study participants still living were interviewed at age 40 (Schweinhart, 2007, p. 3).

Furthermore, students selected for the High/Scope Perry Study had low IQ scores, (between 70 and 85), had no organic deficiencies, and were considered high risk of failing school. The groups were equal in age, socioeconomic status, gender, and I.Q. (Parks, 2000).

According to results published by the High/Scope foundation children who were a part of this study had higher earnings, fewer arrests, higher graduation rates, and higher rates of job retention. Additionally, participants in the High/Scope Perry program were less likely to use public assistance as adults or have births out of wedlock, and they were more likely to own a home. Based on these findings alone, an investment in high quality preschool would result in a

taxpayer return in savings of welfare benefits, savings in criminal justice, and increased tax revenue from higher earnings (Parks, 2000).

Chicago Child-Parent Center Pre-school Program

The CPC began as a life course study of 1539 low-income minority children (93% black, 7% Hispanic) who were born in 1979-1980 and attended one of 25 early childhood program sites between the years of 1985-1986 in the Chicago area. Since 1985, data have been collected on these participants through school records, participant and family surveys, and administrative records. The intervention group (those 1539 selected students) and comparison groups (those not selected to receive the intervention program) were matched in age, eligibility for and enrollment in early childhood programs, and federal poverty rates (Reynolds et. al., 2007). Components of the CPC program included parental involvement, comprehensive services, and a child-centered focus on the development of reading/language skills. The comprehensive services included providing nutritional and health services for the children and scheduled home visits. Children who participated in the CPC portion of the study benefited in many areas. Of particular note were higher overall school achievement, lower rate of grade retention at age 15, a lower dropout rate, and higher high school completion by the age of 20 for students who received the intervention services (Ou & Reynolds, 2006).

Abecedarian Project

Arguably the most successful intervention program was the Carolina Abecedarian Project. The critical difference between this program and the High/Scope Perry was the age of initial date of intervention. Unlike the High/Scope intervention, which began at age three to four, the Abecedarian Project began with intervention at infancy. The program enrolled 111

infants between 1972 and 1977, with 57 randomly assigned to the intervention and 54 in a control group. Those children selected to participate in the intervention attended school full day, year round, in a center-based environment. Also included in the intervention were on-site health care and parental counseling (University of North Carolina Child Development Institute, 2007). Children selected for the program were from families meeting a “high-risk index,” which was constructed based on household income, parental education, school histories of family members, welfare payments, parental intelligence, and parental occupations (Masse & Barnett, 2002).

Results for this group of students were also impressive through age 21:

Children who participated in the early intervention program had higher cognitive test scores from the toddler years to age 21; academic achievement in both reading and mathematics was higher from the primary grades through young adulthood; intervention children completed more years of education and were more likely to attend a four-year college; intervention children were older, on average, when their first child was born; the cognitive and academic benefits from this program were stronger than for most other early childhood programs; enhanced language development appears to have been instrumental in raising cognitive test scores; mothers whose children participated in the program achieved higher educational and employment status than mothers whose children were not in the program; these results were especially pronounced for teen mothers. (University of North Carolina Child Development Institute, 2007, p. 2)

Virginia Preschool Initiative

Virginia is one of 38 states that support a preschool program focused on early learning in order to promote school readiness and achievement. Its system is considered a state-initiated preschool program that is designed to serve at-risk four year olds not currently being served by another program. Virginia's preschool program began as a proposal by the Commission on Equity in Public Education in January 1994, which was presented to the General Assembly. One of four recommendations presented by this commission included a provision for the creation of a preschool program for un-served at-risk four year olds.

In making its determination to begin a preschool program for at-risk children, the Virginia Department of Education first grappled with exactly how a quality preschool program would be defined. In final consensus the following definition was agreed upon for the VPI program (Joint Legislative Audit and Review Commission [JLARC], 2007):

an early childhood program provided for children before their entrance to kindergarten, which meets established quality criteria and which provides five major services: education, health, parent involvement, social services and transportation (p. 5).

As a result of the 1994 proposal, the 1995 General Assembly appropriated \$10.3 million dollars through the Omnibus Education Act (HB2542) as well as the Appropriation Act. Passage of these two bills reinforced the 1994 proposals and provided an expansion of the Virginia Preschool Initiative (VPI). Provisions pertaining to the program appear under subsection C of the legislation. In stating its rationale for support of the measure, the General Assembly stated (JLARC, 2007),

The General Assembly find that effective prevention programs designed to assist children at risk of school failure and dropout are practical mechanisms for reducing violent and criminal activity and for ensuring that Virginia's children will reach adulthood with the skills necessary to succeed in the twenty-first century; to this end the following program is hereby established (p. 18).

By 2005-2006 state funds were available to fund at 100 percent all of Virginia's at-risk four year olds not being served by Head Start. In addition the legislature added new language to the Appropriation Act that allowed the Virginia Department of Education to appropriate grants to localities for one-time expenses, other than capital outlay, which were related to initiation or expansion of existing preschool programs. Since its inception, the State of Virginia and localities have spent a combined estimated \$570.7 to \$607.1 million on the VPI program, or an average of \$49 million per year. As of 2007 this cost had risen to more than \$89 million per year (JLARC Report Summary, 2007).

According to the Report of the Joint Legislative Audit and Review Commission, (2007.), "this preschool program now serves four-year-old children who are considered "at-risk" of not doing well in school due to challenges such as coming from a family-in-poverty background" (p. i). Additionally, the program provides preschool services throughout the school year free of charge for families. Costs incurred for the program are funded through state and local governments.

As of 2009 the approved funding for the VPI program stands at \$6,000 per eligible child. This cost is shared by the state and local governments based on the localities' ability-to-pay index. In order for a locality to receive funding it must operate on a full-day or half-day basis for

the entire school year, not exceed the maximum class size of 18 students, employ one teacher for any class of nine or fewer, and employ a full-time aide if the class exceeds nine (Virginia Preschool Initiative, 2009).

According to the state application for funds documentation, the purpose of the Virginia Preschool Initiative grants is to “reduce disparities among young children upon formal school entry and to reduce or eliminate those risk factors that lead to early academic failure” (Virginia Preschool Initiative, 2009, p. 2). As a result of this mission statement, localities must develop a written plan that includes the following services:

1. Quality preschool education
2. Parental Involvement
3. Comprehensive child health services
4. Comprehensive social services
5. Transportation (2009, p. 2)

The State Department of Education assesses successful parental involvement as, providing parents the opportunity to participate in planning and program activities, frequent communication from the school with parents, either individually or as a group, and the availability of resource materials to parents on such topics as parent-child relationships or child behavior (JLARC, 2007).

In addition to parental involvement, the legislation also includes provisions for health services, social services and PALS testing. Health services for children should include full immunizations, vision, hearing and dental screening, eyeglasses, hearing aid or other assistive

devices as necessary, physical health evaluations and periodic check-ups. (Virginia Preschool Initiative Application, 2009)

Social services for families and children are to include identification of those community resources which may be beneficial to the family and appropriate referrals to such services. All preschool programs are required to use the PALS-PreK literacy program during the fall and spring of each year to assess early reading acquisition.

PALS

The PALS-PreK (Phonological Awareness Literacy Screening Instrument for Pre-kindergarten Students) instrument was developed in conjunction with the University of Virginia at the Curry School of Education with funding from the Virginia Preschool Initiative.

According to the Virginia State Preschool Initiative Guidelines webpage the PALS instrument “assesses rhyme awareness, upper and lower case alphabet knowledge, beginning sound, verbal memory, print knowledge, concept of work and name writing” (2009, p. 22)

According to an April 2009 briefing by the Joint Legislative Review Committee, 2007 results of PALS screening showed “10 percent of the students entering kindergarten who participated in a Virginia Preschool Initiative program needed intervention services in kindergarten the next school year” (p. 30). This compares to the statewide average for all kindergarteners of 16.46 percent. This statistic seems to confirm that in the areas of rhyme awareness, alphabet knowledge, beginning sound, verbal memory, print knowledge, and concept of work and name writing, those students who attended the Virginia Preschool program outperformed those students who did not.

The curriculum which is utilized in each of the preschool programs within localities must align with the *Virginia Foundation Blocks for Early Learning*. These state standards assess “a measurable range of skills and knowledge essential for four year olds to be successful in kindergarten” (House Document No. 44, 2007 p. vi). These skills “reflect a consensus of children’s conceptual learning, acquisition of basic knowledge, and participation in meaningful and relevant learning experiences” (2007, p. vi). These skills include instruction in literacy, mathematics, science, history and social science, physical and motor development, and personal and social development. In addition, as a part of quality control for the VPI program, sites are subject to a review every other year by a VPI Consultant. Such visits are used to ensure compliance with the state mandates, as well as to provide guidance and state oversight (Appendix A).

It is interesting to note that though Virginia requires four year olds to be at-risk to participate in the VPI program, it states that localities are encouraged to develop selection criteria based on their definition of *at-risk*. The state goes on to list such examples as poverty; homelessness; parents who have limited education or are chronically ill; family stress from violence, crime, underemployment; child health or developmental problems including, developmental delays, low birth weight, or substance abuse, or the child is an English language learner as being indicators of at-risk qualification. In the case of the school system used for this study, the locality chose to use eligibility for the free and reduced lunch program as the primary eligibility requirement. In addition no more than 10 percent of the schools’ population can be identified as eligible for special education services.

Solving the Preschool Puzzle

Soon after taking office, on January 16, 2006, Governor Timothy M. Kaine signed Executive Order #7, creating the Start Strong Council (Commonwealth of Virginia, 2006) “to develop expanded access to quality pre-kindergarten for Virginia’s four year olds” (para. 2). The council was comprised of various constituencies, including legislators, public and private providers of preschool services, local elected officials, business leaders and parents. According to a Start Strong Council Report (2007, p. 3), the council was charged to “explore the benefits and opportunities of expanding access to high quality preschool for four year olds in Virginia, and to bring specific recommendations for strategic expansion of access to high quality preschool in the Commonwealth.”

The committee investigated longitudinal studies of the impact of preschool on individuals, public school systems, communities, the workforce, and the economy. Studies included in the investigation were the Abecedarian project, the High/Scope Perry Preschool Initiative and the Chicago Child-Parent Centers.

The council then began investigating the existing preschool programs in Virginia, across the United States, and in other countries. Specifically the council targeted programs “that target at-risk (typically by income level) children and those that are more inclusive of children in a range of socio-economic situations” (Start Strong Council Final Report, 2007, p. 4)

As a result of the council’s investigation, they recommended a pilot initiative to test the use of strategies identified to overcome barriers to full and expanded access to high quality preschool. As a result, in 2007 an additional \$2.7 million was added to the preschool budget to test strategies that would build upon the Virginia Preschool Initiative. Specifically added to this

legislation was language that mandated additional funding be spent on preschool programs that had successfully linked public schools and non-profit or private providers for preschool program delivery. This new blending of non-profit or private providers, such as Head Start programs, religious providers, and private for-profit center is the model for the “network” approach the council has recommended.

The council report states, “The network is a web that is woven with strong support connecting a sound, focused state infrastructure to local leadership displayed through advisory councils” (2007, p. 10). The committee goes on to propose that while many excellent preschool programs exist in Virginia, the overall system is fragmented and inefficient. The committee contends that Virginia is not maximizing the resources and capabilities it already possesses in the diverse preschool programs operating in the state. Currently, the state is served by three major public programs: the Child Care Subsidy Program, Head Start, and the Virginia Preschool Initiative. While all these programs have at their core the mission to serve children of low-income families, they have inconsistent educational goals and practices. Inconsistencies include “differing income criteria, program requirements, staff qualifications, oversight systems, match requirements, governance structures, and expectations for comprehensive family services” (2007, p. 23). In addition these programs often compete for the same children.

In order to overcome the aforementioned challenges, the Start Strong Council has recommended the creation of advisory councils at the local level. These councils would be charged with bringing together public and private preschool providers in order to determine the community’s needs and to make decisions about how best to serve those needs.

The Start Strong Council, in its July 18, 2007, meeting, adopted the following six recommendations for the Commonwealth of Virginia and presented them to Governor Kaine. These recommendations are to be the framework for the network preschool system established by the state.

Recommendation #1

Virginia should develop a coordinated approach to delivery of a high quality preschool program by development of a state level office to consolidate existing relevant early childhood programs; and should engender collaborative leadership councils at the local level.

Recommendation #2

Virginia should support a coordinated system of professional development in order to ensure a strong early childhood professional workforce.

Recommendation #3

Virginia should adopt a voluntary 5-star rating system that promotes program quality based on the statewide QRIS developed by the Alignment Project team for preschool programs in both public and private settings. Phased-in implementation of the initiative should be supported through pilots in diverse communities and settings as well as adequate funding for technical assistance and mentoring to meet quality standards. State-funded preschool programs serving four year olds should be held accountable for meeting a minimum quality rating.

Recommendation #4

Virginia should use both direct investment and incentives to build capacity and raise quality in the early childhood education system over a period of three to five years, taking into account the direct and indirect costs of providing high quality preschool programs in a comprehensive early childhood system, including effective program administration, evaluation, quality assurance, technical assistance and monitoring, and workforce development costs.

Recommendation #5

Virginia should adopt a common definition of school readiness that is accepted and supported by all early childhood programs in both the public and private sector in order to facilitate the development of a common approach to evaluate pre-K program performance as well as the school readiness of Virginia's children.

Recommendation #6

Virginia should work with business, education, and philanthropic organizations to broaden public understanding of early childhood education, helping to explain its long-range social and economic importance for all citizens.

High Scope Preschool Educational Approach

According to the Executive Summary on the Validity of the High/Scope model (Schweinhart, 2007) the High/Scope model of preschool education is a result of the practices developed by David Weikart and his colleagues in the 1960s. The curriculum was further

modified in the late 1980s to include music and movement and again in the early 1990s to include computers. The curriculum, which features activities that engage learners as active participants, is based on the child development ideas of Jean Piaget. The curriculum is centered on activities that the child chooses, based on interest, then carries out, and finally reflects and shares with an adult. This process is referred to as the “plan-do-review” sequence. These patterns are part of what High/Scope considers the predictable sequence of events or the daily routine. The program stresses the importance of this consistent daily classroom routine as critical, “giving the child the control necessary to develop a sense of responsibility and to enjoy the experience of independence” (2003, p. 2). The lengths of these daily routines vary from program to program but generally follow the pattern of planning time, 10-15 minutes/ work time, 45-60 minutes/ recall time, 10-15 minutes/ small-group time, 10-15 minutes/ large-group time, 10-15 minutes/ and outside time, 30-40 minutes. Added to this pattern are also transition time, eating and rest times, and adult team planning times which vary based on the individual program (*Highscope Educational Research Foundation, 2010*).

While the plan-do-review aspect of the program is critical to effective student participation in the program, the key experiences are the central focus for teachers. According to Schweinhart (2007, p. 3), these key experiences “are a way of helping adults support and extend the child’s self-designed activity so that developmentally appropriate experiences and growth are constantly available to the child.” A child’s progress toward meeting these key experiences is documented in the High/Scope Child Observation Record, or COR. Effective use of the COR involves teachers documenting brief notes, or anecdotal comments, on a child’s progress and

interaction with the components of the key experiences. Teachers then use this anecdotal log to classify the child's behavior on the 30, 5-level COR items.

Schweinhart (2007, p. 4) stresses that an integral part of the High/Scope curriculum is effective, ongoing training for teachers and aides. He states, "Training has to be on-site and model-focused." He further states that in order to be effective, the training must be held within the unique setting in which children and adults are working, as well as the unique social community within which the school operates.

Furthermore, Schweinhart (2007) states that "the goal of the High/Scope model is to enable young children to achieve greater school success and adult socioeconomic success and social responsibility by giving them opportunities to initiate and engage in learning activities that contribute to their cognitive, affective and physical development."

The High/Scope curriculum was chosen as the teaching model for the study's targeted school system. The methodology chapter detailed how the researcher measured whether or not students who attended preschool with this teaching method outperformed their peers who did not attend.

Chapter Three

Methodology

Research Design

While countless studies have been published concerning the efficacy of preschool programs, particularly concerning those programs which are considered the most successful- High/Scope Perry program, the Chicago Parent Center and the Abecedarian Program, there remains little or no data on the whether or not attendance in the Virginia Preschool Initiative program increases achievement for elementary students in reading and math. As a result, this study was constructed to specifically target those at-risk preschool children who did or did not attend the VPI program over a four-year time period. These cohorts were followed through the fifth grade and results from their third- and fifth-grade SOL tests were compared. For the purposes of this study the researcher choose to use a causal-comparative design. Five null hypotheses were developed in order to determine whether or not any significant differences in achievement existed between those at-risk students who attended preschool and those who did not. They included:

1. There will be no significant difference in the third- and fifth - grade reading and mathematics Standards of Learning achievement test scores of at-risk students who attended preschool and those who did not.
2. In comparing gender differences, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk students who attended preschool and those who did not.

3. In comparing ethnic differences of the four predominant student populations—White, Black, Hispanic and Asian, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
4. In comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
5. In comparing school attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

The researcher used a t-test to compare the overall pass rates of SOL testing in third and fifth grade between those students who attended preschool and those who did not. In addition an ANOVA was used to determine whether significant differences were noted in achievement of the four ethnic groups represented in the study. In selecting students who were all identified as at-risk by federal lunch program standards, some homogenous grouping was gained. In addition, groups were also created for comparison purposes by race and gender, further strengthening a homogeneous grouping. While this combination actually reduced the external validity of the test to only this particular homogenous group, the findings were nonetheless applicable and appropriate for the local school system in assessing the overall impact of the program as it relates to SOL testing in mathematics and reading at the third- and fifth-grade levels.

Control in teacher presentation and assessment of students was gained through the conformity of mandating compliance with the High Scope Preschool Program. The target schools' preschool program has, since its inception in 1990, used the High Scope curriculum as the instructional program for all its preschool classrooms. Preschool teachers and teaching assistants receive High Scope training every summer for two or five days, depending on their amount of previous training. Experienced and successful High Scope teachers and assistants attend two days of training. Teachers and assistants who are newly exposed to the High Scope philosophy and curriculum attend five days of training. Sandy Slack, endorsed High Scope trainer, is the presenter for all trainings in the target county.

The High/Scope Curriculum is based on 58 **Key Developmental Indicators** (Appendix B). **KDIs** are the building blocks of thinking and reasoning at each stage of development. These KDIs help guide teachers in lesson planning and evaluation of individual students. Each KDI statement is an observable child behavior that is considered a childhood milestone. These KDIs reflect knowledge and skills in the five dimensions of school readiness: approaches to learning, language, literacy; communication; social and emotional development; physical development; and arts and science. In order to measure a child's mastery in these areas, the teacher is trained to use the **Child Observation Record or COR**, (See Appendix C) assessment component of the High Scope curriculum. Preschool teachers regularly write anecdotal notes based on observations of their students. The notes are entered into a computer program. At the end of the reporting period, a family/parent report will be printed and sent home with the children detailing the child's progress toward meeting his/her goals.

Following is the schedule of the reporting periods for the 2009-2010 school year:

- 1st reporting period: August 19 - November 13 Report to parents on November 20
- 2nd reporting period: November 14 - March 2 Report to parents on March 9
- 3rd reporting period: March 3 - June 2 Report to parents at End of Year Conference

Research Subjects

The subjects of this study were the at-risk populations of elementary students who entered the preschool program in a southwest Virginia public school program between the years of 1999-2002 in comparison to those at-risk students during the same time period who did not attend the preschool program. Three schools were selected for the study. Participation in the preschool program was granted on a first-come, first-served basis, with the school system determining in advance the total number of students who would be accepted into each classroom.

The at-risk students who entered the preschool program during the years from 1999-2002 served as population 1. The at-risk students who did not participate in the preschool program but entered the kindergarten program with the members of population 1 served as the comparison group (population 2). *At-risk* classification used was based on eligibility to participate in the federally funded free and reduced lunch program during the students' third- and fifth-grade placement. No distinction was made between those who were selected for reduced lunch and those who were selected for free lunch; all such students were considered *at-risk*.

Instruments

The instrument being used to measure achievement in this study was the Virginia SOL test in reading and mathematics, grade levels three and five. This is a standardized test given to all third- and fifth-grade students in the state at the end of the students' respective school year in order to measure proficiency in reading and mathematics. A score of 0-399 is considered *failing*,

a score of 400-499 is considered *passing*, and a score of 500-600 is considered *passing advanced*.

According to the Virginia Department of Education website, the third-grade mathematics SOL test is designed to measure competency in the following objectives:

The third grade standards place emphasis on learning multiplication and division facts through the nines table. Concrete materials and two-dimensional representations will be used to introduce addition and subtraction with fractions and decimals and the concept of probability as chance. Students will use standard units (U.S. Customary and metric) for temperature, length, liquid volume, and weight and identify relevant properties of shapes, line segments, and angles.

(VDOE, 2008)

In the area of third-grade reading, the SOL test is designed to measure competency in the following objectives:

Emphasis is on learning about words, reading age appropriate text with fluency and expression, and learning comprehension strategies. The student will read a variety of fiction and nonfiction literature, which relates to all areas of the curriculum. The student will use effective communication skills in group activities and will present brief oral reports. Reading comprehension strategies will be applied in all subjects, with emphasis on materials that reflect the SOL in mathematics, science, and history and social science. The student will plan, draft, revise, and edit stories, simple explanations, and short reports. In addition, the

student will gather and use information from print and non-print sources. The student also will write legibly in cursive. (VDOE, 2008)

Likewise, the state has also provided similar objectives for the fifth - grade SOL tests. In the subject area of mathematics, the following competencies are stressed:

The fifth-grade standards place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display, and analyze data in a variety of ways and solve probability problems, using a sample space or tree diagram. Students also will solve problems involving volume, area, and perimeter. Students will be introduced to variable expressions and open sentences. (VDOE, 2008).

According to information provided by the Virginia Department of Education the SOL test in the area of fifth-grade reading is designed to measure the following:

Reading and writing skills continue to support an increased emphasis on content-area learning and utilization of the resources of the media center, especially to locate and read primary sources of information. The student will read texts in all subjects and will acquire information to answer questions, generate hypotheses, make inferences, support opinions, confirm predictions, compare and contrast relationships, and formulate conclusions. The student will continue to develop an appreciation for literature by reading a variety of fiction and nonfiction selections. The student will continue to increase communication skills used in learning activities and will use online, print, and media resources to prepare presentations. The student will use oral and written communication skills to describe key

concepts and information contained in the mathematics, science, and history and social science SOL. In addition, the student will plan, draft, revise, and edit writings to describe, to entertain, and to explain. (VDOE, 2008)

The SOL exams are administered electronically each spring. The reading test is a multiple-choice format with thirty-five scored questions and seven field test questions (which are not scored) on the third-grade exam, and forty scored questions and ten field test questions on the fifth-grade exam. The mathematics exam follows the same format, with both the third- and fifth-grade exam containing forty scored questions and ten field test questions.

Procedures in Collecting Data

The classroom rolls of those students who participated in the preschool program from 1999-2002 were provided to the researcher by the county school system. As an administrator in the system, the researcher was given access to the data management system, which included such data as SOL, SAT, and Iowa test scores. Students were identified by a generic labeling system, such as numeric, ensuring that no child's individual test scores be recognizable. In addition, a list of all students who attended the three selected elementary schools who were approved for free and reduced lunches during the testing grades, years 2003-2008, were provided to the researcher by the food service department. In order to access this information, documentation was provided by the researcher to the Department of Agriculture stating the intended use of the data and ensuring that no identifiable information would be released. This total group of at-risk students was divided into two comparison groups: those students who attended preschool (population 1) and those who did not attend preschool (population 2). The third- and fifth-grade SOL test results of those two populations were then compared.

The fundamental concept of instrument validity determines whether the test measures what it is intended to measure. In reference to the SOL validity, the Virginia State SOL information page states, “Evidence for validity based on the content of the tests has been carefully gathered and clearly supports the inference that the test scores indicate student knowledge and skill as defined by the SOL tests. An appropriate review process by content experts of individual items, as well as the tests as a whole has been accomplished for each of the tests” (VDOE, 1999, p. 7).

In addition, common threats to an authentic assessment include history, maturation, testing situation, instrumentation, and statistical regression. Of significance to this project in particular were maturation and instrumentation. Natural maturation may account for gains, particularly in the fifth grade, as students become more comfortable with school expectations and assessment procedures. In addition, the SOL assessments undergo a three-year realignment, which may or may not affect overall pass percentages year to year.

Such issues as testing conditions, health of child, external distractions noise, etc. are a part of any testing scenario and as such will not be seen a compromise to the resulting scores.

Data Analysis

The SOL scores received by these two populations in grades three and five in reading and mathematics were converted to a mean score; these mean score rates were then compared to determine if the at-risk students who attended the preschool program passed the reading and mathematics SOL assessments at a statistically significantly higher rate than did their at-risk peers who did not attend preschool. A t-test was used to determine whether or not the differences between the two groups were indeed significant. In addition to this information, the

overall pass rate of each gender group and the represented ethnic groups (African American, White, Asian and Hispanic) were compared to determine whether students who attended the preschool program passed at a significantly higher rate than their at-risk peer group who did not attend preschool.

Statistical Procedures

Several different statistical procedures were used in this study. In the first aggregation of data, a mean score received on the two tests, reading and mathematics, for both the third- and fifth-grade cohort was calculated for each of the two groups being studied, those at-risk students who attended preschool and those at-risk students who did not.

In addition to the mean, the median, standard error, mode, range, standard deviation, sample variance, and confidence level were also calculated. This data compilation allowed the computation of the correlation coefficient among the various groups.

Of primary interest to this study was the impact preschool education may or may not have on third- and fifth-grade academic achievement for at-risk students. As a result, a t-test was used to establish whether or not a significant difference existed between the two groups. An alpha level of .05 was used as the level of significance. In addition to the overall comparison of students who did attend preschool and those who did not, a t-test was also performed to establish whether a statistically significant difference was discovered between the gender groups, and an ANOVA was calculated to determine if statistically significant differences were present in the achievement of the four ethnic groups cited earlier.

Summary

As discussed earlier in this proposal, millions of dollars are currently being spent and allocated for preschool programs nationwide. While there seems to be little doubt that students benefit in a variety of areas from these types of programs, this study sought to establish whether or not the preschool initiative in a rural school district significantly impacted student academic success in the area of state-mandated testing. If such gains can be established, it would seem the need for such programs is justifiable and funding should be continued and perhaps expanded, particularly in economically devastated areas where high populations of at-risk students live and attend public schools. However, if the results show no significant gains in educational attainment, other criteria would need to be chosen to measure whether or not these programs are indeed beneficial.

Chapter IV

Results

This chapter presents the findings of a causal-comparative research project which tracked the academic achievement of at-risk students who both attended, as well as did not attend, the state-funded preschool education program during the years of 1999-2002. Acceptance to the preschool program during the years researched was limited to those families who met the federal guidelines for participation in the free and reduced price lunch program. In addition, participation was limited to a “first-come first-served” basis, with total class occupancy limited to no more than eighteen students per classroom. Three elementary schools within the county’s five preschool programs were chosen as part of the study. All three of the schools utilized the High/Scope Perry preschool curriculum as the educational program.

To achieve the purposes of this study, five null hypotheses were posed. First, there will be no significant difference in the third- and fifth-grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not. In addition, considering gender, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not. Third, considering ethnicity, there will be no significant difference in the third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not. Fourth, in comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not. Lastly, in comparing school

attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

Comparison of test results

The null hypotheses posed for this study considered whether or not significant differences in academic achievement on the state SOL reading and mathematics tests in third and fifth grade would be found for those at-risk students who attended preschool as opposed to those at-risk students who did not attend preschool. In addition, differences in academic achievement would be investigated by gender and by ethnicity. In order to investigate these null hypotheses, the populations from three southwest Virginia schools were included in the study. Students selected to be included in this study were any at-risk student who had either attended preschool or any student eligible to, but who had not chosen to attend for the school entry years of 1999-2002. This group of students, which numbered 915, was then followed throughout their elementary career. Any student who remained at the school in which he/she either attended preschool or was eligible to attend and completed both the reading and mathematics SOL assessments in third and fifth grade was retained for inclusion in the study. This final total sample numbered 498. This sample group was then divided into those who attended preschool and those who did not and were used to answer the five null hypotheses posed in chapter one.

First Null Hypothesis

The first null hypothesis posed stated that there will be no significant difference in the third- and fifth - grade reading and mathematics Standards of Learning achievement test scores of at-risk students who attended preschool and those who did not.

In order to test this hypothesis the researcher combined all students into one of two categories, *attended preschool*, or *did not attend preschool*, regardless of year entering the program. These two groups were then compared using an independent sample t-test to determine whether a significant difference in achievement was found in mathematics and reading, regardless of grade testing was conducted. Of the 498 students selected for the study, 128 students attended preschool (meeting the pre-stated criteria to be included), and 370 did not. The mean test scores for these two groups showed a higher mean for those who did not attend in reading, did attend ($M = 456.31$, $SD = 55.763$), did not attend ($M = 468.27$, $SD = 59.452$), and a higher mean in mathematics for those who did attend, did attend ($M = 490.67$, $SD = 71.031$), did not attend ($M = 488.45$, $SD = 74.919$). Results of the t-test showed a significant difference in achievement in reading for students who did not attend ($t_{(496)} = -1.992$, $p = .047$), and non-significance of difference for students in mathematics ($t_{(496)} = .292$, $p = .770$), as shown in Tables 1 and 2 respectively.

Table 1

Comparison of Reading Mean Scores for All Students

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance-p</i>
Attended	128	456.31	55.76			
				496	-1.99	.04
D/N Attend	370	468.27	59.45			

Significance at $p < 0.05$

Table 2

Comparison of Mathematics Mean Scores for All Students

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance-p</i>
Attended	128	490.67	71.03			
D/N Attend	370	488.45	74.91	496	.29	.77

Significance at $p < 0.05$

Second Null Hypothesis

The second null hypothesis stated that in comparing gender differences, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk students who attended preschool and those who did not. In order to test this hypothesis the researcher first completed an independent sample t-test to determine if, regardless of grade level tested, any significant differences existed for all at-risk males and females (regardless of whether or not they attended preschool). Of the selected students, 220 were female, and 278 were male. Results indicated that while the mean scores were different for each gender in both mathematics and reading, as shown in Table 3 and 4, only the reading results proved to be significantly different. An independent sample t-test statistical analysis confirmed

that the male reading mean score ($M = 456.56$, $SD = 58.531$) and female mean score ($M = 472.03$, $SD = 58.039$) proved to produce a significant difference ($t_{(496)} = -2.943$, $p = .003$), with females outperforming their male counterparts regardless of grade level.

Table 3

Comparison of Mathematics Scores for all Students Based on Gender

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Female	278	493.44	72.25			
				496	-1.50	.13
Male	220	483.44	75.63			

Significance at $p < 0.05$

Table 4

Comparison of Reading Scores for all Students Based on Gender

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Female	278	472.03	58.03			
				496	-2.94	.00
Male	220	456.56	58.53			

Significance at $p < 0.05$

The researcher next looked at achievement in reading and mathematics by gender comparing only those students who attended preschool. Results from an independent sample t-test showed that no significant differences were found between the achievements of students in mathematics when comparing male achievement to female, as shown in table 5 ($t_{(126)} = 1.134, p = .259$), or in reading, as shown in table 6 ($t_{(126)} = -.381, p = .704$).

Table 5

Comparison of Mathematics Scores by Gender for Students who Attended Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Female	77	484.88	68.87			
				126	1.13	.25
Male	51	499.41	73.99			

Significance at $p < 0.05$

Table 6

Comparison of Reading Scores by Gender for Students who Attended Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Female	77	457.84	53.66			
				126	-.38	.70
Male	51	454.00	59.25			

Significance at $p < 0.05$

As a third measure of achievement based on gender, the researcher compared achievement of females based on attendance or non- attendance at preschool in reading and

mathematics and males using the same criteria. Results from this comparison for female students showed that no significant differences in achievement were found in mathematics ($t_{(276)} = -1.224, p = .222$) table 7; however, significant differences were found in reading ($t_{(276)} = -2.547, p = .011$) table 8, with female students who did not attend preschool outperforming their at-risk peers who did attend.

Table 7

Female Achievement in Mathematics – Attendance/ Non-attendance in Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Attend	77	484.88	68.87			
				276	-1.22	.22
D/N Attend	201	496.72	73.41			

Significance at $p < 0.05$

Table 8

Female Achievement in Reading – Attendance/ Non-attendance in Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Attend	77	457.84	53.66			
				276	-2.54	.01
D/N Attend	201	477.46	58.85			

*Significance at $p < 0.05$

Results of the research for male students who attended preschool as opposed to those who did not showed no significant differences in achievement in mathematics ($t_{(218)} = 1.728, p = .085$) or reading ($t_{(218)} = -.356, p = .723$), as shown in Tables 9 and 10.

Table 9

Male achievement in Mathematics – Attendance/ Non-attendance in Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Attend	51	499.41	73.99			
				218	1.72	.08
D/N Attend	169	478.62	75.71			

Significance at $p < 0.05$

Table 10

Male achievement in Reading – Attendance/ Non-attendance in Preschool

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Attend	51	454.00	59.25			
				218	-.35	.72
D/N Attend	169	457.33	58.46			

Significance at $p < 0.05$

Third Null Hypothesis

The third null hypothesis dealt with the issue of differences in achievement based on ethnicity and states, in comparing ethnic differences of the four predominant student populations—White, Black, Hispanic and Asian, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

Of the 498 students included in the study, the ethnic total included 4 Asian students, 183 White students, 32 Hispanic students, and 279 Black students. A one-way ANOVA was calculated for the four ethnic groups represented in the study. The results show that a significant difference did indeed exist between ethnic groups in both reading ($F_{(3, 497)} = 6.845, p < .000$), and in mathematics ($F_{(3, 497)} = 3.514, p = .015$). However, the only significant difference noted was between Asians when compared to each of the other three ethnic groups in both reading and mathematics. When compared, Asian students outperformed all other ethnic groups in both math and reading. No other groups when compared to each other showed significant differences in achievement.

Table 11

Differences in Reading Achievement Based on Ethnicity

<i>Group</i>	<i>Number</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>Significance – p</i>
Asian	4	-125.17	29.16	>.00
Black	27			
Asian	4	-129.24	29.05	>.00
White	183			
Asian	4	-134.56	30.59	>.00
Hispanic	32			

Significance at $p < 0.05$

Table 12

Differences in Mathematics Achievement Based on Ethnicity

<i>Group</i>	<i>Number</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>Significance – p</i>
Asian	4	-116.65	37.05	.00
Black	27			
Asian	4	-108.69	36.92	.01
White	183			
Asian	4	-112.28	38.88	.02
Hispanic	32			

Significance at $p < 0.05$

Fourth Null Hypothesis

The fourth null hypothesis stated that, in comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool. A t-test was

used to compare each of the 4 cohorts individually to determine whether achievement differed in mathematics and reading. The only significant difference was found in reading for the cohort entering the program in 2002 ($t(.098) = -2.441, p = .016$).

Table 13

Reading and Math Achievement 2002

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>Significance – p</i>
Reading						
Attend	47	443.68	55.99			
				143	-2.44	.01
D/N Attend	98	471.07	66.40			
Mathematics						
Attend	47	499.09	63.57			
				143	.32	.97
D/N Attend	98	510.57	67.32			

Significance at $p < 0.05$

Fifth Null Hypothesis

The final null hypothesis tested dealt with differences in achievement when comparing individual schools to one another. It stated, in comparing school attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and

mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

A t-test was used to determine whether differences in achievement found early, particularly in the area of reading could be explained by differences in the performance of each individual school represented in the study. An ANOVA confirmed that a significant difference in achievement did exist among the three schools in the area of reading ($F_{(2, 497)} = 6.052, p = .003$). Further investigation by performing a Tukey confirmed that the difference could be explained in the reading results from 2002. One of the three schools performed significantly lower than the other two in the study as shown in Table 14.

Table 14

Differences in Reading Achievement by School 2002

<i>Group</i>	<i>Mean Difference</i>	<i>Std. Error</i>	<i>Significance – p</i>
School A	-23.49	13.03	.17
School B			
School A	-30.61	12.60	.04
School C			
Significance at $p < 0.05$			

Summary

Five null hypotheses were evaluated for this study of preschool education and its impact on educational attainment for at-risk elementary school students. The first null hypothesis posed stated that there will be no significant difference in the third- and fifth - grade reading and mathematics Standards of Learning achievement test scores of at-risk students who attended preschool and those who did not. Results indicated that students who did not attend preschool had a significant difference in achievement in the area of reading, with female students who did not attend scoring at a higher achievement level. While the mean scores in mathematics were

higher for students who attended preschool, the differences in mean scores were not found to be significant.

The second null hypothesis stated that in comparing gender differences, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk students who attended preschool and those who did not. Results from a t-test using data from all at-risk males and females regardless of attendance at preschool showed that there was not a significant difference in achievement in reading; however, there was a difference in mathematics, with female students outperforming their male counterparts. The researcher then used data from only those students who attended preschool to determine whether significant differences in achievement were present between male and female students. Results from the t-test for both mathematics and reading did not produce a significant difference in achievement based on gender. Finally the researcher compared achievement of females who attended preschool and did not attend preschool to determine if significant differences were present in mathematics and reading achievement. The same analysis was completed for male students. The researcher determined that while differences in mean scores were different for both gender groups in reading and math, only the reading scores for females proved to be significant. In this instance female students who did not attend preschool outperformed their at-risk peers who did attend preschool at a significant rate on the reading SOL tests.

The third null hypothesis dealt with the issue of differences in achievement based on ethnicity and states, in comparing ethnic differences of the four predominant student populations—White, Black, Hispanic and Asian, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool

students who attended preschool and those who did not. While there were no significant differences in achievement among the White, Black, and Hispanic students, there was indeed a significant difference in achievement for Asian students. This significant achievement difference was apparent in every comparison of Asian students to the other ethnic groups, in both reading and mathematics.

The fourth null hypothesis stated that, in comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool. A t-test was used to compare each of the 4 cohorts individually to determine whether achievement differed in mathematics and reading. The only significant difference was found in reading for the cohort entering the program in 2002 ($t(.098) = -.2.441, p = .016$). Females who did not attend preschool for this cohort year outperformed their at-risk peers who attended preschool. This proved to be true only for the 2002 school year.

The final null hypothesis tested dealt with differences in achievement when comparing individual schools to one another. It stated, in comparing school attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

A t-test was used to determine whether differences in achievement found early, particularly in the area of reading could be explained by differences in the performance of each individual school represented in the study. An ANOVA confirmed that a significant difference in achievement did exist among the three schools in the area of reading ($F_{(2, 497)} = 6.052, p =$

.003). Further investigation by performing a Tukey confirmed that the difference could be explained in the reading results from 2002. One of the three schools performed significantly lower than the other two in the study.

In the final section the researcher will discuss in greater detail the results and limitations of the study. In addition the researcher will attempt to explain the variations in results as well as discuss possible future studies and implications.

Chapter V

Discussion

Review of the problem

Virginia has invested millions of dollars in the last twenty years to expand its preschool program, as have a score of other states. Such initiatives as Start Strong have been created to integrate public school programs, such as the Virginia Preschool Initiative, with private day care centers, head start programs, and religious affiliated preschool programs. This push to consolidate, monitor and evaluate preschool programs has been presented as a way to strengthen the education that preschool students receive, particularly for at-risk students, on the premise that this intervention will help ensure that children are at a higher readiness level to attend kindergarten and will, as a result, be more academically successful in their educational career, be less likely to be referred to special education, and commit fewer criminal acts, among other goals.

The school system evaluated in this study began offering preschool to a limited number of students in 1997 as part of the Virginia Preschool Initiative. The sponsoring school system chose to use the High/Scope Perry curriculum as its educational program. As is required by state mandate, all teachers hired for the program were Virginia certified teachers, with a concentration in early childhood. Teachers were initially trained in the High/Scope curriculum and are required to retrain yearly with High/Scope Perry certified instructors. Students included in this study entered the program in one of three schools during the years 1999-2002. These four cohorts were tracked throughout their elementary school years.

Review of the methodology

Five null hypotheses were used in this study:

1. There will be no significant difference in the third- and fifth - grade reading and mathematics Standards of Learning achievement test scores of at-risk students who attended preschool and those who did not.
2. In comparing gender differences, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk students who attended preschool and those who did not.
3. In comparing ethnic differences of the four predominant student populations—White, Black, Hispanic and Asian, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
4. In comparing cohort differences of the four years chosen, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.
5. In comparing school attendance differences of the three chosen schools, there will be no significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

In order to test these hypotheses four cohorts of at-risk children who entered the preschool program from the years 1999-2002 were chosen for this study. The three schools selected had established preschool programs in 1997 and were offering the largest number of

slots to at-risk children in the county's preschool program. Of the 915 students who were identified as entering the program during the target years, 498 were eventually selected for the study. These students entered the elementary school's preschool program and remained in the same school through fifth-grade. In addition, these students participated in the state testing program in both third- and fifth-grade, completing both the reading and mathematics assessment. This final cohort of preschool students was used as the comparison group against those at-risk children who did not attend preschool during the aforementioned years. This group of at-risk children numbered 128 for the four years chosen in the study.

These at-risk children's third- and fifth - grade SOL scores were compared in both reading and mathematics to determine whether any significant differences in achievement existed between those students who attended preschool and those who did not. In addition to the overall comparison of achievement differences, analysis was also conducted to determine whether differences in achievement existed among gender groups, ethnic groups, cohort groups and schools.

Discussion of the results

In the area of overall achievement in mathematics and reading for students who attended preschool as opposed to those who did not, no significant differences in achievement were found in the area of mathematics, when comparing all genders, all cohorts, all schools, and all ethnicities. However, a significant difference in achievement was found in the area of reading. This difference in achievement was found to show that students who did not attend preschool during the four years selected outperformed their at-risk peers who did attend.

In order to establish exactly where the differences could be found, an analysis was completed comparing gender groups, first comparing all males to females, regardless of attendance at preschool, next comparing male to female for those who did attend preschool, and last comparing those males who attended preschool to those males who did not, and likewise for females.

Results of the first of these three comparisons showed that for all gender groups, regardless of whether or not the child attended preschool, no significant differences were present in the area of mathematics; however, a significant difference in achievement was present for reading, with females outperforming males in this area.

Further analysis was completed on the differences in achievement for gender groups, comparing only those males who attended preschool to those females who attended preschool. Results of this analysis showed that no significant differences in achievement were found in either mathematics or reading achievement for these two groups.

The third analysis based on gender compared those males who attended preschool to those males who did not in both reading and mathematics. The same analysis was completed for females. Results of this analysis showed that no significant differences were present in the male populations, either in reading or mathematics. However, for females, significant differences in reading achievement were present, with females who did not attend preschool outperforming their female peers who attended preschool.

The third hypothesis concerned ethnic differences; in comparing ethnic differences of the four predominant student populations - White, Black, Hispanic and Asian, there will be no

significant difference in third- and fifth - grade reading and mathematics SOL achievement test scores of at-risk preschool students who attended preschool and those who did not.

While this proved to be true for three of the ethnic groups - White, Black, and Hispanic, a significant difference in achievement was found when comparing the Asian population to the other ethnic groups. In each comparison Asian/White, Asian/Black, Asian/Hispanic, Asian students outperformed their peers.

An analysis comparing the achievement of each cohort group was completed to determine whether significant differences in achievement could be discovered. When comparing cohorts against one another, the only significant differences in achievement could be found in 2002, in the area of reading. In an attempt to further explain this variation, an additional analysis was completed comparing each represented school. The variation in achievement found in the cohorts could be explained by the significant difference in achievement for one particular school during the year of 2002 in reading. This school, during the 2002 year, performed significantly lower than the other two schools on the end-of-course SOL test in reading, thus creating an overall disparity in achievement for cohorts.

Limitations of the study

While this study attempted to follow the progress of all at-risk preschool children who were eligible to begin preschool from the years of 1999-2000, it became increasingly clear that subject attrition would become a major factor. Various factors contributed to this attrition. Perhaps the greatest impact on the study was the students who entered the preschool program but were then not tested in the third or fifth grade. This choice not to test students by the administration, particularly those students who had entered the program in the first two years of

the study, meant that a great number of the students were dropped from the study due to lack of data. This phenomenon was particularly prevalent in one of the three schools.

The second greatest limitation to the study concerned mobility of the student population. Students who entered a preschool program and later transferred to another school were not included. While this group of students was not particularly large, it did exclude these students from the analysis. This migration of students, particularly those students who are at-risk, has been an ongoing problem for the district as families are constantly changing localities in order to secure a place to live. This makes tracking students by name alone nearly impossible.

Another limitation to the study concerns the relative “newness” of the program for the years studied. As is often the case in education, when a new program is launched, it takes time for teachers, administrators, parents, and students to adjust to the new curriculum, standards and expectations. It is believed that as all constituencies learn, adapt to, and implement the program, an increase in student achievement can be expected.

In addition to the aforementioned limitations, a recent report released by the Center on Education Policy, as reported by CBS News (2010), states that while girls generally achieved the same proficiency in math as boys at the elementary grade levels, “girls outperformed boys at all grade levels in reading, in many states the learning gap exceeded 10 percent.” This study would seem to support the notion that regardless of preschool intervention, females will outperform males in reading assessments, thus making the impact of preschool on reading achievement more challenging to effectively measure.

Implications of the study

Results of this study indicate that long-term academic achievement for at-risk students who attended preschool during the target years in the selected county was little different from the achievement of those who did not attend preschool. In actuality, those females who did not attend preschool outperformed those who did attend preschool. It should be noted, however, that successfully tracking of all students who entered the program during the targeted years was extremely difficult, resulting in a lack of data which may or may not have affected the results.

In its Commission Briefing to the General Assembly, the Joint Legislative Audit and Review Commission (2007, p. 51) stated,

VPI appears to be a good program, with positive classroom learning environments, high student engagement levels, and favorable pre-K and K literacy test results ...however the DOE should conduct a longitudinal study of students who completed VPI and other preschool programs to determine long-term performance on SOL tests.

It is indicative from this study that a more efficient manner of tracking children is necessary in order to determine whether or not preschool for at-risk students results in overall higher SOL achievement as children mature. As is pointed out in the Commission report, data have not been available for a student-level analysis of the test results beyond the initial Pre-K and K PALS scores. While these Pre-k and PALS testing results are beneficial in determining short term gains in phonological awareness and early reading skills, they do little in the way of measuring long-term academic achievement on state and federal mandated tests.

As is cited by the Joint Legislative Audit and Review Commission (2007, p. 2), whether or not “Virginia has a quality preschool program across the various Virginia school divisions has been unclear, as are program outcomes for the students. One of the criticisms of VPI is that evaluative information regarding the program is lacking.”

Recommendations for additional research

As cited in the JLARC summary (2007, p. 73), “Longer-term student-level data are still needed to better assess the impact of VPI on test scores in later grades. Division-analysis of 2006 test results at the third- and fifth-grade levels produced unclear results.” This commission reports that although regression analysis was completed on the 2006 cohorts testing results, the outcomes were mixed and did show a strong, “consistent impact on SOL scores due to VPI enrollment” (2007, p. 84).

As a result of the Joint Legislative Audit and Review Commission briefing, (2007), new state guidelines have been established in order to more effectively manage and track individual students upon entering a preschool program. Beginning with the fall 2007 collection of student data, all students in a pre-kindergarten or junior kindergarten program that is locally, state, or federally funded is assigned a State Testing Identifier. This assignment of a State Testing Identifier will allow the student’s academic records to be viewed throughout his/her entire school career. This unique number will allow school systems to report all relevant information, such as gender, race, free and reduced lunch status, and complete testing history (SOL, SAT, ACT etc.) in one location. As a result, any school to which the child may relocate within the Commonwealth of Virginia will have access to the student’s testing record.

Effective analysis of this wealth of information will allow researchers to more accurately access just what, if any, academic outcomes can be found when comparing those at-risk children who attended preschool (particularly the VPI enrollments) and those who did not. Such analysis of SOL data will be available for the first time state wide with the results of the 2010-2011 spring testing.

Additionally, according to the Joint Legislative Audit and Review Commission report, there is some debate over the longer term educational gains for these types of programs. While the weight of evidence from key studies of many quality preschool programs indicate that they can produce “long-term positive effects on IQ scores, student achievement test scores, grade repetition, special education placement, high school graduation and delinquency” (2007, p. iii), further studies are necessary to determine whether these prove true for the students participating in the VPI program.

Further Thoughts

The No Child Left Behind Act mandates that all students be “proficient” by the year 2014, a feat unprecedented in human educational history. To reach that goal, NCLB requires schools to test 95 percent of all students in grades 3-8 every year in math and reading and at least once in high school. Test results are analyzed for nine subgroups, such as black students, special education students, and bilingual students. If one of those subgroups fails to meet its mandated target, in any one of those tests, in any one of those grade levels, the entire school will not make “adequate yearly progress” and can be labeled a failing school. After two years, failing schools are subject to sanctions. As a result, states, schools, and administration are under tremendous pressure to ensure that all students can and will be academically successful. Preschool is seen as

yet another program that could help students and educators meet these ever-tightening requirements.

Public education in the United States is arguably our most important domestic policy. It represents the nation's greatest effort to turn the ideology of the American dream into practice, and it has accomplished a great deal for this country, recently as well as historically. With the implementation of No Child Left Behind, we are asking our children, teachers and administrators to reach academic goals that have never been attempted before.

The Roman philosopher Epictetus is credited with saying that only the educated are free. It is not enough to be born into a land of liberty and opportunity. True freedom means the presence of real options; education is what gives an individual the personal power to put that choice into execution. Education, in other words, is really what determines how much freedom we have. However, too often that choice is dictated by what socio-economic background a child is raised. Preschool is just one program that attempts to level the playing field for all children.

Public schools are essential to make the American dream work. They provide the means for all individuals to pursue success, and teach future citizens to promote the common good so that the dream can continue in future generations. Tragically, however, the schools are also the arena in which some children first fail, most commonly because they simply have not had the same opportunities as other more affluent children.

If preschool is indeed to be the key to guaranteeing that *all* children enter school with the skills they need to be successful in our American educational system, then we must do more to ensure that it does indeed live up to these expectations, for the sake of all our future generations and their turn at the American Dream.

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Appendix A

VIRGINIA PRESCHOOL INITIATIVE SITE VISIT INSTRUMENT

LOCALITY _____ ____ Requirement	Is there sufficient documentation that this requirement is being met?	Documentation
1. The locality will provide a high quality comprehensive preschool program for at-risk four year olds not served by Head Start.	Yes No Curriculum Name: _____	-Curriculum must be research-based, comprehensive, integrated across all domains -Professional development plan for current year -Lesson plans -Classroom observation by consultant
2. The program will align preschool curriculum with Virginia's Foundation Blocks for Early Learning.	Yes No	-Scope and sequence of curriculum -Documentation of alignment from locality or publisher
3. PALS-PreK will be used as a literacy screening in the fall and spring of each year. All results will be reported to the PALS office in the fall and in the spring.	Yes No	-Documentation that fall and spring scores have been reported to the PALS office.
4. The program will maintain a maximum group size of 18 children with a child/staff ratio of 9:1.	Yes No	-Class roster
5. Programs not located in public schools will comply with the Standards for Licensed Child Day Centers.	Yes No	-License from social services

6. Children served will reach their fourth birthday on or before September 30th.	Yes No	-Student records or class roster with birth dates
7. The program will be half-day (3 hrs.) or full-day (6 hrs.) and at least school-year (180 days).	Yes No	-School calendar -Class schedule
8. The locality will develop and use criteria for eligibility.	Yes No	-Eligibility criteria form -Rank listing of students
9. Program personnel will have the appropriate professional credentials for the program site.	Yes No	-Copy of licensure for teachers
10. The locality will develop a written local plan. The plan will include a description of these services: educational program, parent involvement, health services, social services, and transportation. Please attach a copy of the budget to the plan.	Yes No	-Detailed local plan to include each required component
11. No participation fees will be charged to families	Yes No	-Budget

<p>12. The required local match will be met. At least 75 percent of the local match will be cash and no more than 25 percent will be in-kind.</p>	<p>Yes No</p>	<p>-Budget summary -Budget breakout</p>
<p>13. State funds will be used only for educational personnel and program requirements.</p>	<p>Yes No</p>	<p>-Budget breakout</p>
<p>14. The locality will maintain a steering committee to coordinate with schools, child care providers, local social services agency, Head Start, local health department, and other groups identified by the lead agency.</p>	<p>Yes No</p>	<p>-List of committee members and agency they represent -Dates of meetings or agendas or minutes/ notes from meetings</p>

Signed - Virginia Preschool Initiative Consultant Date

Signed - Local VPI Program Representative Date

Appendix B

High Scope Curriculum Content Guide

What Is the High/Scope Preschool Curriculum?

High/Scope Preschool Curriculum Content

Approaches to Learning

- ◆ Making and expressing choices, plans, and decisions
- ◆ Solving problems encountered in play

Language, Literacy, and Communication

- ◆ Talking with others about personally meaningful experiences
- ◆ Describing objects, events, and relations
- ◆ Having fun with language: listening to stories and poems, making up stories and rhymes
- ◆ Writing in various ways: drawing, scribbling, and using letterlike forms, invented spelling, and conventional forms
- ◆ Reading in various ways: reading storybooks, signs and symbols, and one's own writing
- ◆ Dictating stories

Social and Emotional Development

- ◆ Taking care of one's own needs
- ◆ Expressing feelings in words
- ◆ Building relationships with children and adults
- ◆ Creating and experiencing collaborative play
- ◆ Dealing with social conflict

Physical Development, Health, and Well-Being

- ◆ Moving in nonlocomotor ways (anchored movement: bending, twisting, rocking, swinging one's arms)
- ◆ Moving in locomotor ways (nonanchored movement: running, jumping, hopping, skipping, marching, climbing)
- ◆ Moving with objects
- ◆ Expressing creativity in movement
- ◆ Describing movement
- ◆ Acting upon movement directions
- ◆ Feeling and expressing steady beat
- ◆ Moving in sequences to a common beat

Arts and Sciences

Mathematics

Setiation

- ◆ Comparing attributes (longer/shorter, bigger/smaller)
- ◆ Arranging several things one after another in a series or pattern and describing the relationships (big/bigger/biggest, red/blue/red/blue)
- ◆ Fitting one ordered set of objects to another through trial and error (small cup and small saucer; medium cup and medium saucer; big cup and big saucer)

Number

- ◆ Comparing the numbers of things in two sets to determine "more," "fewer," "same number"
- ◆ Arranging two sets of objects in one-to-one correspondence

Counting objects

Space

- ◆ Filling and emptying
- ◆ Fitting things together and taking them apart
- ◆ Changing the shape and arrangement of objects (wrapping, twisting, stretching, stacking, endosing)
- ◆ Observing people, places, and things from different spatial viewpoints
- ◆ Experiencing and describing positions, directions, and distances in the play space, building, and neighborhood
- ◆ Interpreting spatial relations in drawings, pictures, and photographs

Science and Technology

Classification

- ◆ Recognizing objects by sight, sound, touch, taste, and smell
- ◆ Exploring and describing similarities, differences, and the attributes of things
- ◆ Distinguishing and describing shapes
- ◆ Sorting and matching
- ◆ Using and describing something in several ways

- ◆ Holding more than one attribute in mind at a time
- ◆ Distinguishing between "some" and "all"
- ◆ Describing characteristics something does not possess or what class it does not belong to

Time

- ◆ Starting and stopping an action on signal
- ◆ Experiencing and describing rates of movement
- ◆ Experiencing and comparing time intervals
- ◆ Anticipating, remembering, and describing sequences of events

Social Studies

- ◆ Participating in group routines
- ◆ Being sensitive to the feelings, interests, and needs of others

The Arts

Visual Art

- ◆ Relating models, pictures, and photographs to real places and things
- ◆ Making models out of clay, blocks, and other materials
- ◆ Drawing and painting

Dramatic Art

- ◆ Imitating actions and sounds
- ◆ Pretending and role playing

Music

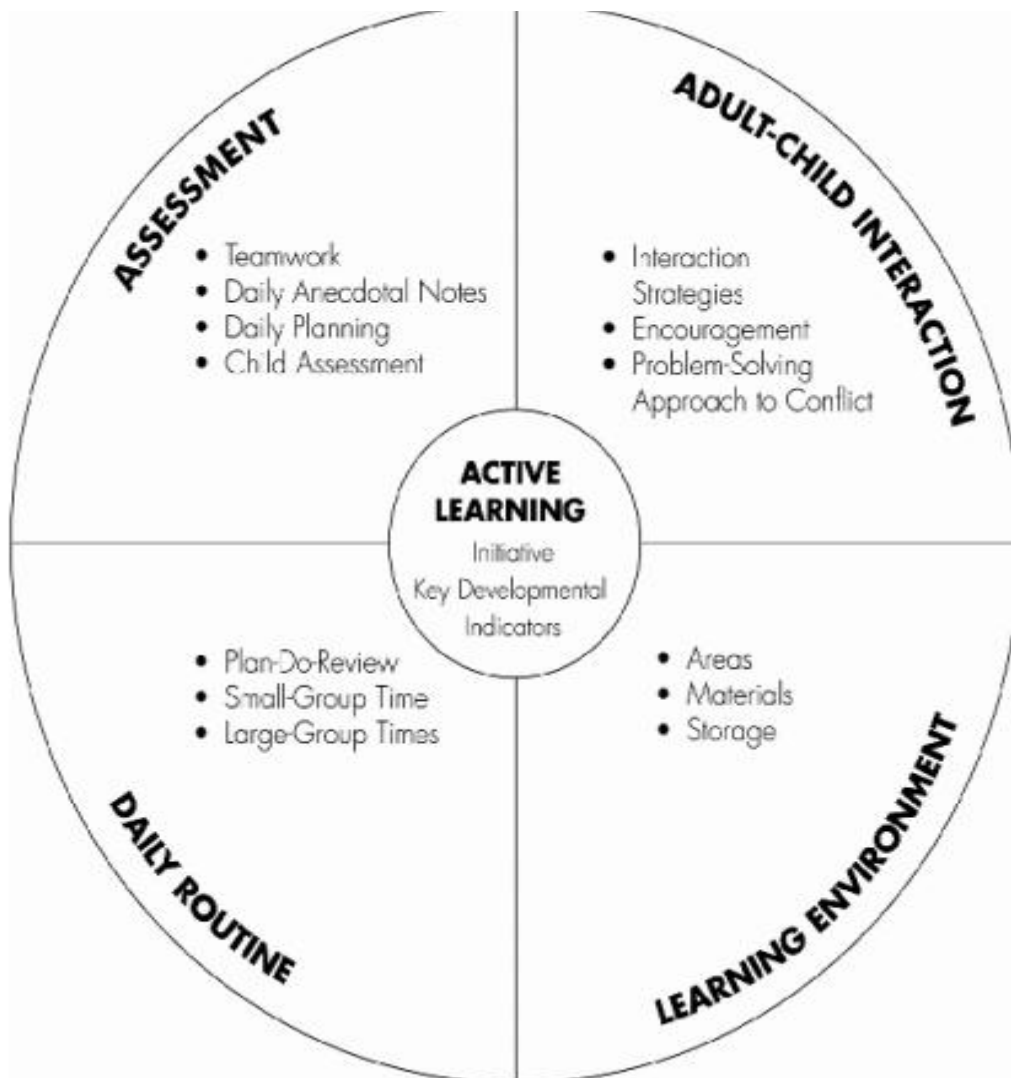
- ◆ Moving to music
- ◆ Exploring and identifying sounds
- ◆ Exploring the singing voice
- ◆ Developing melody
- ◆ Singing songs
- ◆ Playing simple musical instruments



Key developmental indicators (KDIs) are the building blocks of thinking and reasoning at each stage of development. High/Scope identifies 58 preschool KDIs organized under five content areas.

Appendix C

COR High Scope Assessment Tool



Appendix D**IRB Approval Letter**

LIBERTY
UNIVERSITY™

Center for Counseling and Family Studies

9-21-09

Pamela Randall

IRB Approval 740.092109: Pre-School Education and Resulting Academic Effects for Third and Fifth-Graders

Dear Pamela,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. You'll find the forms at the IRB website for those cases. Also, feel free to email us with any questions (irb@liberty.edu).

Thank you for your cooperation with the IRB and we wish you well with your research project. We will be glad to send you a written memo from the Liberty IRB, as needed, upon request.

Sincerely,



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