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## **A study of the influence of preschool settings on school achievement**

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A STUDY OF THE INFLUENCE OF PRESCHOOL SETTINGS  
ON SCHOOL ACHIEVEMENT

By

Sharon McNeel Humphrey

A Dissertation  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy  
in Elementary, Middle, and Secondary Education Administration  
in the Department of Educational Leadership

Mississippi State, Mississippi

May 2008

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2008

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The purpose of this study was to examine the preschool settings of the Pearl River community and assess the effectiveness of certain preschool programs regarding the achievement of Native American kindergarten students. The data were examined to compare student achievement of the Pearl River Elementary School kindergarten class of 2006-2007 as measured by the *TerraNova* subtests in Reading/Language and Mathematics.

A sample of  $n = 74$  was obtained for this study. Descriptive statistics were used to analyze previous preschool experiences of the participants. Demographic data showed that most students in the Pearl River Elementary School kindergarten class of 2006-2007 had attended some type of preschool. *TerraNova* scores for the participants were also examined. Descriptive statistics were used to examine how well the kindergarten students

at Pearl River Elementary School compared with the national average. The data indicated that the kindergarteners at Pearl River Elementary School did not score as high as the national average on any of the subtests for Reading, Language, and Mathematics. A MANOVA was used to test the null hypothesis that stated that there were no statistically significant differences among the means of the *TerraNova* scores based upon type of preschool attended. The independent variable for the analysis was type of preschool attended. The dependent variables were the subtest scores on the *TerraNova* in Reading, Language, and Mathematics. Results indicated that students who had attended the Pearl River pre-kindergarten program outscored the students who had attended the Pearl River Head Start program in both Language and Mathematics subtests. Results did not indicate that there was any statistical difference in the mean of the Reading subtest based upon type of preschool attended.

Recommendations for further study include obtaining another sample that would incorporate variables not used in the current study. Research should be done to examine curricular differences among pre-kindergarten, FACE, Head Start, and Day Care programs. Students should also be tracked to measure the long term effects of attending each of these programs. Alternate assessments for student achievement of preschool and kindergarten students should also be considered for further research.

## DEDICATION

I dedicate this research to my mother, June T. McNeel, and to the memory of my father, Brigadier General Robert C. McNeel.

## ACKNOWLEDGMENTS

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## TABLE OF CONTENTS

	Page
DEDICATION .....	ii
ACKNOWLEDGEMENTS .....	iii
LIST OF TABLES .....	vii
CHAPTER	
I. LITERATURE REVIEW .....	1
Review of Literature .....	2
Influence of Preschool on School Achievement .....	2
Types of Preschool Settings .....	4
Public School Pre-Kindergarten .....	4
Head Start .....	6
Day Care .....	8
Family and Child Education (FACE) .....	10
Home-Based Child Care .....	14
Native American Education .....	17
Academic Performance of Native American Students .....	17
Learning Styles of Native American Students .....	19
Norm-Referenced Standardized Tests .....	20
Problems with Standardized Tests .....	21
Standardized Tests and Native American Students .....	21
Summary .....	22
Mississippi Band of Choctaw Indians (MBCI) .....	23
Types of Preschool Settings for MBCI .....	27
Pearl River Elementary School Pre-Kindergarten .....	27
Pearl River Head Start .....	28
Pearl River Day Care .....	29
Pearl River Family and Child Education (FACE) .....	31
Summary for MBCI Preschool Settings .....	32
Purpose of the Study .....	34
Research Questions .....	34
Justification .....	35

CHAPTER	Page
II. RESEARCH METHODS .....	36
Research Design and Justification .....	36
Participants.....	37
Context of the Study .....	37
Instrumentation: <i>TerraNova</i> .....	38
Administering the <i>TerraNova</i> .....	39
Type of Questions on the <i>TerraNova</i> .....	39
<i>TerraNova</i> Test Results and Their Uses .....	40
Validity and Reliability of the <i>TerraNova</i> .....	41
Limitations of the <i>TerraNova</i> .....	41
Role of the Researcher .....	41
Procedure .....	42
Data Analysis.....	43
III. RESULTS .....	46
Descriptive Statistics.....	46
Participants.....	46
Kindergarten <i>TerraNova</i> Scores for Pearl River Elementary School.....	49
Inferential Statistics .....	52
Assumptions for Multivariate Analysis of Variance (MANOVA).....	52
Normality of the Dependent Variables .....	53
Equality of Variance-Covariance Matrices.....	53
Linearity and Multicollinearity of the Dependent Variables .....	54
Multivariate Analysis of Variance (MANOVA) .....	55
IV. DISCUSSION, LIMITATIONS, AND RECOMMENDATIONS.....	59
Type of Preschool Attended.....	59
<i>TerraNova</i> Scores for Pearl River Elementary School.....	60
Effect of Preschool Setting on Academic Achievement.....	61
Limitations of the Study.....	64
Conclusions and Recommendations .....	65
REFERENCES .....	68
APPENDIX	
A PERMISSION LETTER TO CONDUCT RESEARCH AT PEARL RIVER ELEMENTARY SCHOOL .....	75

B INSTITUTIONAL REVIEW BOARD APPROVAL.....	78
C COMPARISON OF STANINES AND PERCENTILES .....	80

## LIST OF TABLES

TABLE	Page
1.1 Educational Requirements for Head Start Teachers .....	29
1.2 A Summary of Key Components of Pearl River Preschool Settings.....	33
3.1 Frequencies for Preschool, $n = 74$ .....	47
3.2 Frequencies for Preschool, $n = 59$ .....	48
3.3 Frequencies for Preschool, $n = 47$ .....	49
3.4 Summary of <i>TerraNova</i> Test Scores, based on percentile rank, $n = 71$ .....	50
3.5 Summary of <i>TerraNova</i> Test Scores, based on stanine rank, $n = 71$ .....	51
3.6 Descriptive Statistics for Dependent Variables, $n = 47$ .....	52
3.7 Test of Normality for Dependent Variables, $n = 47$ .....	53
3.8 Levene's Test of Equality of Error Variance, $n = 47$ .....	54
3.9 Collinearity Statistics for Dependent Variables, $n = 47$ .....	54
3.10 Multivariate Tests, Type III SS, Pillai's Trace, $n = 47$ .....	55
3.11 Univariate Tests, Type III, SS, $n = 47$ .....	57
3.12 Mean Estimates for Preschool, $n = 47$ .....	58
C.1 Comparison of Stanines and Percentiles .....	81

## CHAPTER I

### LITERATURE REVIEW

The dependence of school achievement on school readiness is well documented. Research has been done showing that preschool programs have had a positive effect on school readiness and student achievement. Many types of preschool programs have been created to improve children's school achievement. Research has been done documenting the effects of various preschools on minorities. Studies have shown that minority children have greatly benefited by participating in preschool programs.

This study addresses the benefit of attending a preschool on school performance of Native American children in kindergarten as measured by the *TerraNova* standardized assessments. The Mississippi Band of Choctaw Indians provides a variety of preschool programs for children in the Pearl River community, located in Neshoba County, Mississippi. Currently, recognized preschool programs in the Pearl River area include the Pearl River pre-kindergarten, Pearl River Head Start, Pearl River Day Care Center, and the Family and Child Education (FACE) program. This research is an attempt to assess which of these preschool programs, if any, has had the most success in preparing children for kindergarten.

## Review of the Literature

The focus of the review of literature is divided into five categories: (a) a description of public school pre-kindergarten programs, Head Start programs, Day Care programs, the Family and Child Education (FACE) program, and home-based child care, (b) Native American Education, (c) norm-referenced standardized tests, (d) background information pertaining to the Mississippi Band of Choctaw Indians, and (e) specific descriptions of preschool programs available in the Pearl River community.

### *Influence of Preschool on School Achievement*

Preschool has a positive influence on school achievement. Statistics reported in the 2004 Kindergarten Survey Report show that children who attended preschool, Head Start, and Early Childhood Special Education posted higher ratings on all readiness dimensions than those who did not attend educational centers (Castillo, 2004). Research has shown that a child's future educational performance is influenced by his or her readiness for school. School readiness impacts a child's social responsibility and economic status (Wright, Diener, & Kay, 2000).

Children who are ready for school have better chances of succeeding academically. According to Maeroff (2006), educational experiences gained during the years between pre-kindergarten and 3<sup>rd</sup> grade form the basis for school readiness and school success. The early years are the foundation on which a child's future is built.

Children in rural areas have fewer opportunities to attend preschool. According to Grace, Shores, Zaslow, Brown, and Aufseeser (2006), educational settings, such as licensed day care centers, are limited in rural areas. Children in rural areas usually spend

more time at home or with close relatives than at formal child-care facilities. Another study done by the National Center for Education Statistics in the U.S. Department of Education also showed that children in rural America are significantly less likely than children in urban areas to enter kindergarten with early literacy skills such as letter recognition or beginning sounds recognition (Walston & West, 2004).

Many Native American children live in rural areas. Currently there are approximately 560 Native American tribes recognized by the federal government, with the majority living in rural areas. Of this number, approximately 70% are low-income families with annual incomes of less than \$25,000. Considering the poverty and rural settings of many tribes, providing early childhood education for the children of these families is difficult (Thompson & Hare, 2006).

Increased availability to high-quality preschool programs for all children decreases the gap in early education inequalities. Stipek (2005) stated that at-risk children from low-income families are at a significant disadvantage when they begin school. Magnuson, Ruhm, and Waldfogel (2004) also found that at-risk children benefit from attending preschool programs. They concluded that children who attend some type of preschool program are linked with higher reading and math skills when they enter school.

Some types of preschool programs have proven to be more beneficial than others. Research conducted by Sadowski (2006) investigated the effects of half-day and full-day preschool programs. He found that the children who attended the full-day program performed higher on literacy and math than those who attended the half-day programs.

The achievement gap between upper- and lower-income children was also narrowed by the full-day program.

### *Types of Preschool Settings*

Many types of preschool settings exist. Among the most recognized and researched programs for Native American children include public pre-kindergarten classes, Head Start programs, day care centers, and the Family and Child Education (FACE) program. Participation in any preschool program is optional, and many parents choose to oversee their own children's early education in a more traditional setting of home-based child care.

#### *Public School Pre-Kindergarten.*

Magnuson et al. (2004) defined pre-kindergarten as the first formal academic classroom-based learning experience that a child customarily attends. It begins around age four in order to prepare for the more academically intensive kindergarten, the traditional "first" class of children. The objective of pre-kindergarten is to prepare children to better succeed in kindergarten, which is often compulsory in many states. Pre-kindergartens focus equally on a child's cognitive, social, physical, and emotional development. State-created teaching standards are followed in shaping curriculum and instructional activities and goals. Pre-kindergartens function within a public school under the supervision of a public school administrator and are funded completely or partially by state or federally allocated funds.



Although pre-kindergarten programs are becoming more popular, the research on their effects is narrow. It has been recognized that pre-kindergarten does increase a child's readiness in reading and mathematics skills when the child enters school. Children from families financially unable to provide books and other educational materials in the home benefit from the larger academic programs of pre-kindergarten. Typically, pre-kindergarten programs are of higher quality than other early education programs as far as promoting academic skills and preparing children for school entry (Magnuson et al. 2004).

Pre-kindergarten programs prepare children from a variety of backgrounds for school. Gormley, Gayer, Phillips, and Dawson (2005) conducted a survey of 1,567 pre-kindergarten 4-year-old children and 1,461 children who had completed a pre-kindergarten program in Tulsa, Oklahoma. The universal pre-kindergarten program in Oklahoma was established in 1998 for 4-year-old children. State aid is provided to school districts for every child enrolled in the pre-kindergarten program, and school districts elect to participate or not. The children were compared on spelling, applied problems, and letter-word identification. Results of the study showed that the children who participated in the state-funded universal pre-kindergarten program scored higher on cognitive tests that measured pre-reading and reading skills, pre-writing and spelling skills, and math reasoning and problem-solving skills than those who did not participate in the pre-kindergarten program. Gormley et al. (2005) found that a diverse group, including Hispanic, Black, White, and Native American, as well as children in diverse income groups, benefited from the Oklahoma state-funded pre-kindergarten program and

concluded that Oklahoma's program enhanced school readiness. Gormley et al. (2005) concluded that universal pre-kindergarten programs operated by public schools can prepare children from varied backgrounds in reading, writing and problem solving. Children who attend public pre-kindergarten programs were also better able to master these skills in later grades.

Research indicated that pre-kindergarten programs increase student test scores in many areas. Barnett, Lamy, and Jung (2005) conducted a study of five state-funded pre-kindergartens in Michigan, New Jersey, Oklahoma, South Carolina and West Virginia. Significant effects including an increase of an 8% increase in average vocabulary scores, a 13% increase in average math scores, and a 39% increase in children's print awareness scores were found, producing broad gains in learning and development when entering kindergarten. This in turn can be expected to produce greater school success.

#### *Head Start.*

Head Start is a national program whose primary focus is to help children of low-income families become ready to succeed at school. If families meet the income guidelines, children are eligible to enroll. Funds are provided to local public agencies, private organizations, and school systems to operate Head Start programs in their communities. School readiness is promoted by helping preschoolers develop their reading and math skills. According to Marks, Moyer, Roche and Graham (2003), Head Start helps children and their families to improve socially and cognitively by providing for the development of educational and social skills, health and nutritional awareness, and other services. In addition, Head Start is intended to involve parents in their children's

educational development. Linking parents and communities to schooling is one of the objectives of the program.

Head Start programs are expected to maintain many of the standards of public school pre-kindergarten programs. There has been a push by the federal government to improve early childhood education. The No Child Left Behind (NCLB) legislation of 2002 put pressure on elementary schools to focus more on basic academic skills. Under NCLB, K-12 schools are held accountable for making adequate yearly progress. A panel from the National Academy of Science has recommended to the Senate and House of Representatives that new educational performance standards be developed to hold Head Start programs accountable for making progress toward NCLB goals. The panel recommended that funding for Head Start centers be withdrawn if they failed to make progress (Stipek, 2005).

Low-income children receive the most benefit in terms of cognitive development and school readiness from center programs such as Head Start. Research conducted by Loeb, Bridges, Bassok, Fuller, and Rumberger (2005) found that Head Start children of preschool age were more likely to be from single-parent families. Further, the parents did not complete high school, did participate in public assistance programs, and the children had lower birth weight when compared to children in day care centers. For these children from low-income families, Head Start provides cognitive developmental skills to assist in school readiness.

Head Start bridges the gap between disadvantaged Caucasian children attending Head Start centers and their peers who attended other preschool programs. Currie and

Thomas (1995) reported that Head Start is associated with a 16% decline in the probability of Caucasian children having to repeat early grades. In their study, Currie and Thomas found that Head Start has positive effects on test scores and educational achievement of disadvantaged Caucasian children.

Head Start increases the linguistic capabilities of Native American children. In one study, 48 Cherokee children enrolled in Cherokee Nation Head Start in Tahlequah, Oklahoma, were compared to 37 Caucasian children in non-Head Start and day care centers. The findings indicated that although the scores of Native American children were lower than the scores of the Caucasian children, as the children's ages increased, the differences between the two groups progressively decreased. In the younger children there were significant differences in developmental skills, particularly in linguistics. The findings indicated that, when enrolled in Head Start, the language skills of the Cherokee children improved (Marks et al., 2003).

#### *Day Care.*

A day care center is an organized facility licensed to provide care for many children. States regulate licensed day care centers and state standards may vary. The use of day care is related to parental employment and income and to certain family characteristics, such as marital status, ethnicity, parental education, and age of the child. The National Association for the Education of Young Children (NAEYC) (2007) was established as an accrediting agency for day care centers; it was one of the first organizations to set standards and offer certification to day care centers. Licensed day care centers may become accredited by meeting quality criteria. To obtain NAEYC

accreditation, programs must go through a four-step process – enrollment, application, candidacy, and on-site visit. NAEYC recognizes ten standards of excellence. The ten standards are positive relationships, curriculum, effective teaching approaches, ongoing assessments, nutrition and health, teaching staff, family, community, physical environment, and high-quality experiences.

Children who attend day care centers tend to develop more socially than children who are in home based child care. They learn how to meet and how to interact with other children and know what is expected from them in a formal environment with their peers. Children in day care centers learn more about acceptable social rules, how to play with other children, and how to talk more with their peers. Unfortunately, children in day care centers are also more likely to display behavioral problems such as getting into fights, arguing or disobeying (Broude, 1996). Gormley, et al. (2005) found, however, that only a minority of children appears to fall into this category of exhibiting disruptive behavior after attending any type day care (not just center based day care).

Day care centers provide children with a vast array of activities that foster school readiness. The National Institute of Child Health and Human Development (NICHD) conducted a study that began in 1991 and followed children from one month of age through the ninth grade. This study found that the amount of time a child spends in day care is a factor in predicting future classroom performance. One of the major characteristics of effective day care is the presence of a trained, highly educated caregiver. This in conjunction with a low adult-to-child ratio creates an environment where children can develop many of the skills needed to excel in school. In day care

centers, children are allowed to choose whether to work alone or in a group and are allowed to move around the classroom to work or play. The experiences of day care prepare students for many of the types of activities they will encounter in a more formal academic setting (U.S. Department of Health and Human Services, 2006).

Long-term participation in day care significantly improves the academic achievement of children. A study by Caughy, DiPietro, and Strobino (2004) investigated the impact of day care participation during the first three years of life on the cognitive development of children between the ages of five and six using the Peabody Individual Achievement Test subtests of mathematics and reading recognition. Children who had begun day care before their first birthday were associated with higher reading recognition scores as compared to other children in the study. Time of entry into day care did not have a significant effect on mathematics scores.

#### *Family and Child Education (FACE).*

The Family and Child Education (FACE) program, which is administered by the Bureau of Indian Affairs (BIA) Office of Indian Education Program (OIEP), provides early childhood and adult education programs to Native American families. Since its inception in December 1990, FACE has provided early or pre-literacy experiences for children and their families in the home as well as early childhood and adult education programs in school. Important features of the program are its support of parental involvement in a child's educational experience, school readiness, adult literacy, and life long learning. FACE provides opportunities for adults to complete their education and

obtain workplace skills and, in this manner, strengthen connections between families, communities, and schools (Tippeconnic & Jones, 1995).

FACE is based on the belief that, beginning at home, early childhood development increases a child's educational success. FACE serves children 0 – 5 years old and their parents in home-based and center-based learning environments. In addition, children in grades K-3 are offered instructional support, such as tutoring programs, through the FACE program (U.S. Department of the Interior, 2006).

Since its inception, one of the FACE program goals has been to support parents as the first and most influential teacher of their children. Parent educators visit the home and provide information on child development to help parents develop effective skills needed to assist their children in the learning process. Many of the parent educators are Native American and are thus able to conduct home visits in the family's native language (U.S. Department of the Interior, 2006).

The home-based component serves children ages 0-5 and their families. Two educators go into the home and teach a curriculum to the parents/guardians and child together. The educators check to see if the children are on an age-appropriate developmental level. The children are screened for hearing and vision problems. Once a month the FACE educators conduct a group meeting called *Family Circle* for parents of children aged 0-3. The parents are educated on different topics concerning child development. Through the adult education component, parents realize that they are their child's first teacher in everything.

The center-based component is divided into two areas: early childhood education and adult education. The parents/guardians in the FACE program are required to participate with their child in the center-based component. Children ages 3-5 qualify for the early childhood classroom which has a teacher with a B.S. degree and a co-teacher who has 60 hours of undergraduate academic coursework. They follow a curriculum where they learn through play. Children ages 5-8 continue to participate in FACE by participating in PACT (Parent and Child Together Time) for one hour a day on Monday through Thursday. Parents go to their child's classroom on these days and participate in whatever skill is being taught in the classroom in an effort to help parents learn their child's strengths and weaknesses.

An important aspect of the FACE program is the incorporation of tribal languages and cultures in the program's daily operation. This develops a stronger home-school relationship as well as strengthens the connection between family, school and community. Community/tribal members are invited to attend special events as guests and present or teach cultural traditions (Tippeconnic & Jones, 1995).

Characteristics common of FACE participants include the following:

- Almost one-third of FACE children live with a single parent; one-third live with both parents.
- Two-thirds of FACE children have mothers who completed high school or who have a GED equivalent; one-third of the FACE children have mothers who did not finish high school.



- Approximately three-fourths of FACE children have fathers who completed high school or received a GED equivalent.
- Approximately 40% of the FACE families receive public assistance.
- Two-thirds of FACE children have mothers who do not work; almost 60% have fathers who are unemployed.
- Although English is the primary language for about three-fourths of FACE children, approximately 60% of the families speak a second language.
- FACE families, on average, include five or six individuals. FACE families on average have 1-2 children under the age of six and 2 children over six years of age (U.S. Department of the Interior, 2006).

The influence of FACE has become widespread within the Native American community. FACE was implemented in 1991 at 6 sites. By 2004 the number of sites had increased to 39. The FACE program gives children experience in a preschool classroom. Children have the opportunity to interact with other children. Parents can see and better understand their child's development. Literacy programs and GED courses as well as college preparation courses are offered to parents so that they may improve their study skills for college and/or employment (U.S. Department of the Interior, 2006).

Research has shown that the Family and Child Education program has prepared parents for academic success. According to Semali (2007), parents participating in FACE have taken advantage of the adult education programs available. Over 400 adults have received their GED and 1,500 adults have obtained employment after completing the FACE program. The study also found that 80% of parents have continued to participate

in their child's education after they leave the FACE program. They attend parent-teacher conferences, do volunteer work, and are more likely to serve on school committees.

Research has also shown that the Family and Child Education program has prepared children for academic success. Semali (2007) reported that test results show that Native American children who have participated in FACE score higher on standardized achievement tests than their non-participating counterparts. Semali found that the "length of preschool attendance is a direct, significant, and meaningful predictor of language and literacy skills upon children's entrance to kindergarten" (p. 60). FACE prepares children for school by increasing their self-confidence, verbal communication, interest in learning and reading.

#### *Home-Based Child Care.*

Home-based child care takes place in a home rather than in an institutional or center setting. Home-based child care can be provided by spouses alternating work schedules, a live-in caregiver, an outside caregiver, or having the child in another family's home. Researchers (Broude, 1996; Krauss, 1998) have found that home-based child care is used more for infants and toddlers than center-based care. Often center care is used in conjunction with home-based child care. Parents may place their child in day care for half a day and for half a day with a family caregiver (Krauss). Broude stated that, "Home-based day care is actually equivalent or superior to center-based care when it comes to the physical development and health of children attending day care" (p. 103).

Changes in society have influenced the role of home-based child care in early childhood education. Dramatic changes in families have occurred in the 21st century. In

2000, 57% of mothers were working as compared to only 24% in 1970. As a result of the increased number of mothers in the workforce, the number of children attending some type of child care increased. This child care may be provided by relatives or sitters in the home, centers, or some type of regulated home-based child care (Marshall, 2004).

The educational opportunities of home-based child care vary from family to family. Children who stay in the home are affected by parental education, parental depression, parenting practices, and family income. These elements play an important role in a child's development. Low-income families tend to have less education and are more likely to hold part-time positions in the work force. As a result, children from economically disadvantaged families are often placed in lower-cost day cares or informal care that is often of lower quality. Children of lower-income families are often placed in the care of elder relatives who may not have the time or education to contribute to the children's educational development (Marshall, 2004).

Academic success of Native American children can be affected by their location and living conditions. In the findings of the analysis of the Kindergarten and Birth Cohorts of the Early Childhood Longitudinal Study conducted by Zaslow, Brown, and Aufseeser (2005), it was found that rural life significantly affects school success for Native American children. Rural Native American kindergarteners were more than twice as likely as non-rural Native American kindergarteners to live below the poverty threshold. Only about a third of rural Native American kindergarteners were likely to have a parent with some college education as compared to non-rural Native American kindergarteners. The parents of rural Native American kindergarteners were less likely to

read to their children than parents of non-rural Native American kindergarteners. Outside school, rural Native American kindergarteners were less likely than non-rural Native American kindergarteners to read to themselves. Although Native American children and families who live in rural areas are more likely than their non-rural peers to participate in full-day kindergartens and Head Start programs, the study indicated the following:

- Rural Native American children were more likely to be in home-based child care (44.2%) than in a center-based program in the year before kindergarten.
- The rate for Native American children who receive care by a family relative is higher than for White or Hispanic children (42.5%).
- Only 5.1% of rural Native American children were cared for by someone other than a relative.
- 10.6% of rural Native American children were less likely as rural White children (35.3%) to attend a center-based pre-kindergarten program.

Many parents prefer home-based child care to formal preschool programs.

According to Seo (2003), researchers have examined how parents choose the type of care—relative or family day care or a specific child care center. The most common concerns of parents are location, cost, and hours as opposed to quality of care. Family or relative day care providers are more likely to take children whose parents report to work early or late in the day; parents who work more than 40 hours per week select family or relative day care over specific child-care center due to cost. For parents who work late hours or who work shifts, having a relative or family member such as a grandmother to care for the child is the most logical choice. Location is another factor that influences the

type of care selected. In rural areas, family or relative day care is usually within driving distance of the family home. Seo reported that relatives are usually available when needed where centers often have long waiting lists and are not available when needed. Relatives are often more flexible with their fees for child care as compared to centers.

### *Native American Education*

Native American students tend not to perform academically as well as their counterparts from other ethnic groups (Rampey, Lutkus, & Werner, 2006). Much research has been done examining the underlying causes of these gaps in academic achievement (Davidson, 1992; Nuby & Oxford, 1998; Rougas, 2000; Tippeconnic, 2003). Some factors include aspects of school environment, while others address the differences in learning styles of Native American students and how they may affect overall achievement and success in school.

#### *Academic Performance of Native American Students.*

There are about 650,000 Native American students in the United States. Of that number, 90% attend public schools, while the remainder attends some type of school supported by the Bureau of Indian Affairs (BIA). Some of the issues that face many schools that service Native American students are absenteeism, drop-out rates, and classroom behavior (Tippeconnic, 2003).

Native American students often do not reach the same level of academic achievement in school as Caucasian, middle-class students (Demmert, 2005). Data from the Early Childhood Longitudinal Survey (ECLS) has shown that Native American

kindergarten students enter school behind most other ethnic groups. Statistics from the National Assessment of Educational Progress (NAEP) also indicate that there is an achievement gap between Native American students and Caucasian students in reading, math, history, and science. However, over time, the range of these gaps does decrease. One possible explanation is the influence of culture. Since the language, customs, and childhood experiences of Native American students tend to be significantly different from those of middle class Caucasian students, once in a formal school setting, young Native American students may not have information presented to them within a cultural context that builds on their previously established knowledge base. The context in which information is presented often enhances or hinders a person's ability to understand and apply information correctly. As Native American students' experiences increase, and they learn more about the world from other perspectives, their abilities in regard to traditional academic achievement also increases. Demmert (2005) recommends that the assessment of the achievement of Native American students needs to be compatible with the background knowledge and cultural environment of the students.

There are several factors that influence the school environments of Native American students. Low socio-economic status, family dysfunction, and poor health conditions are persistent problems that still plague many Native American communities. Lack of funding and quality teachers and administrators also affect school environment. Some schools do not have sufficient reading materials or access to technology. Native American students are also less likely to have advanced courses offered in their schools. Measures of achievement are often affected by these factors (Tippeconnic, 2003).

Cultural differences of Native American students influence learning styles. According to Sparks (2000), the cultural practices of children in Native American communities have had a significant impact on how children perform in school. It has been difficult to create an unbiased educational curriculum that is appropriate for all Native American students because there is not one single Native American culture. Some generalities can be made in regard to the presentation of curriculum and assessment, but the tremendous diversity that exists among Native American tribes make it impossible to create a singular approach when attempting to meet the educational needs of Native American students.

#### *Learning Styles of Native American Students.*

Native American students tend to think more globally than students from other ethnic groups. A study conducted by Davidson (1992) tested the cognitive learning styles of Native American and Caucasian students. Her study found that Native American children scored significantly higher on the Kaufman Assessment Battery for Children in areas of simultaneous processing and spatial ability. Results indicated that Native American students have a more global, or holistic style of cognitive learning than Caucasian students.

Research has shown that Native American students have higher visual processing abilities than students from other ethnic groups. A study conducted by Rougas (2000), compared the cognitive abilities of Mohawk adolescents with Caucasian adolescents using the Woodcock Johnson Psycho-Educational Battery-Revised, Test of Cognitive Ability. Results indicated that there was a significant difference in cognitive profiles

based upon ethnicity. About 37% of the variability of the cognitive profiles could be attributed to ethnicity. The largest contribution to the variability was supplied by the Visual Processing subtest. The Mohawk students scored significantly higher than the Caucasian students in the area of visual processing.

There is evidence that Native American students reflect on information differently than students from other ethnic groups. A study conducted by Nuby and Oxford (1998) compared Native American students with African American students using the Myers-Briggs Type Indicator (MBTI). Results showed that there was a statistically significant difference in how Native American students judged information. The majority of Native American students tested were categorized as being “perceiving” personality types, where more African American students were categorized as being “judging” personality types.

Native American students prefer different working environments than students in other ethnic groups. According to Hilberg (2002), Native American students tend to want to collaborate with others to accomplish tasks and solve problems. Native American students prefer to work with a partner or within groups. In Native American culture, students are often discouraged to stand out, whether in a positive or negative way.

#### *Norm-Referenced Standardized Tests*

Norm-referenced standardized tests are an important part of today’s educational environment. The most common use of norm-referenced standardized tests is to classify students. These tests have been created in order to measure achievement differences among students. Researchers create a test and administer that test to a group of students



they consider to be representative of the population before the test is administered on a larger scale. The scores of the initial group are used as the norm group, and the scores of every subsequent group that takes the test is compared to that group. The establishment of norm groups is an exhaustive and expensive process. For this reason, norm groups are only tested on average every seven years (Bond, 1996).

#### *Problems with Standardized Tests.*

There are many concerns associated with the implementation of standardized tests at the beginning levels of education. There is a large variability among the levels of growth and development of children at the kindergarten through second grade levels. Yet standardized tests are used very early to screen students for gifted or remedial programs. Children may lose educational opportunities because the original classification, i.e. remedial, often follows them for years within the educational system. For these reasons, groups such as the Association for Childhood Education International believe that standardized testing should not take place during the elementary levels of education (Perrone, 1991).

#### *Standardized Tests and Native American Students.*

There are several reasons why Native American students may not perform well on standardized, norm-referenced tests. Norm-referenced tests do not consider the language and cultures of Native American learners. Many intelligence tests tend to reduce Native American students into a single culture, when in reality there are more than 560 Native American tribes, clans, and villages, each with a distinct language and culture. True

norm-based referencing of standardized tests for Native American students cannot take place due to small sample size and expense. Native American students' difficulties with standardized testing may stem from socio-cultural difficulties, not academic difficulties (Bordeaux, 1995).

The appropriateness of standardized tests must be continually monitored in order to reduce bias against Native American students. The results of standardized tests are often unreliable because they fail to accommodate students with limited proficiency in English. Also, norm-referenced, standardized tests are highly correlated with socioeconomic status. Educators of Native American students must realize that the sole use of standardized tests may be inadequate and harmful to students in determining their actual levels of achievement (Fox, 2001).

### *Summary*

Research has shown that preschool is beneficial to young children in preparing them for school readiness and academic success. There are a variety of preschool programs available to many people, and Native American children, specifically. Public school preschool programs have achieved a measurable level of success in providing equal opportunities for all children regardless of ethnic or socio-economic backgrounds. High quality day care centers have remained a popular choice for many parents. Head Start provides the opportunity for children from low-income households to participate in early childhood education.

Although many preschool programs exist, many parents continue to choose home-based child care or informal child care for their children. The quality of home-based child

or informal child care varies from home to home. Many of the families who elect not to participate in any type of formal child care do so because of the cost and inconvenience of formal child care.

Academic achievement of Native American students is a concern in today's educational atmosphere of high-stakes testing. Opponents of norm-referenced standardized testing report that the use of standardized testing at young ages may be invalid regardless of ethnicity. One shortcoming of standardized tests is that they have not been norm-referenced for Native American students specifically. The tests fail to take into consideration issues such as language and cultural differences. Research has also been conducted demonstrating that the learning styles of Native American students are significantly different from other ethnic groups. Standardized tests that do not take these factors into consideration may be under-representing the achievement of Native American students.

#### Mississippi Band of Choctaw Indians (MBCI)

This study was conducted with the Mississippi Band of Choctaw Indians (MBCI). Tribal headquarters for the MBCI is located in Choctaw, Mississippi, situated in Neshoba County, which has a higher percentage of Native Americans than any other county in the state. Mississippi Choctaws account for 15% of the population of Neshoba County. In 2001, the county's per capita income of \$17,766 was 27% below the national average of \$30,413. The Research Bureau for the Mississippi Development Authority reported that the population on the Choctaw Reservation in 2003 was 4,311; the per capita income was

\$7,530; and the median household income was \$25,833 (Mississippi Statistical Abstract 2003).

Today's Mississippi Choctaws are descendants who refused to leave during the Removal Period. According to Boykin (2002), only 1,253 Choctaws remained in Mississippi as the 20<sup>th</sup> century began. At best their future looked bleak. Very few owned property, and there was no formal tribal government. Choctaw children worked with their parents in the fields and few attended school. Basic health care was limited. Choctaw adults made their livelihood by sharecropping. In 1918 the U.S. Congress organized a committee to examine the quality of the living conditions of the Choctaw. This committee found that the Choctaw were living in extreme poverty; and in 1918, the Bureau of Indian Affairs established the Choctaw Indian Agency at Philadelphia, Mississippi. Schools were to be opened and health conditions were to be addressed.

A formal Choctaw government began in 1934 with the passage of the Indian Reorganization Act. In 1939, 15,150 acres of land was bought and put in trust for the Choctaw Indian Reservation. Tribal members elected a temporary council, which served as an advisory committee to the Choctaw Indian Agency. In 1944, a proposed tribal constitution was established and sent to the federal government, and in 1945 the United States government accepted the constitution. The Mississippi Band of Choctaw Indians (MBCI) was federally recognized. By this time, elementary schools were operating in most of the tribal communities, and a hospital had been built in Philadelphia (Boykin, 2002).

The tribal economy was slow to change. Most Choctaw made their living doing farm work; a few worked for the Choctaw Indian Agency. By the 1960s, council members knew they had to become more active in the affairs of the tribe and that the tribe had to become less dependent on the federal government. The tribe was indigent. In 1962, Choctaw family earnings were less than \$2,000 a year. Of the 3,000-member tribe only 7% had finished high school. The infant mortality rate was one of the highest in the nation. Plumbing in homes was lacking. With no education, Choctaw adults were unable to find jobs (Hagenbaugh, 2002).

The creation of jobs was an urgent need, and in 1969 Chahta Development, a construction company owned by the tribe, was created. With the federal government providing funding for low-income houses, the tribe's own construction company could build the houses, make a small profit, and provide jobs and skills training. The tribal council recognized the movement of manufacturing to the South during the 1970s and contacted numerous manufacturers. Tax incentives such as no property taxes drew businesses to the reservation where a workforce was available. In order to diversify the tribe's economy, the tribe opened a shopping center and nursing home on the reservation in the 1980s. In 1988 the National Indian Gaming Act was passed which allowed tribes to operate casinos on reservations. Revenue from casinos is exempt from state taxes and is used for tribal welfare. In 1994, the tribe's biggest development, the Silver Star Resort and Casino, began operations. The Choctaw thus began developing tourism, which now includes the Dancing Rabbit Golf Club, Geyser Falls Water Theme Park, and the Golden

Moon Hotel and Casino. The Choctaw Hospitality Institute has been created for workforce training for the casinos and other tribal enterprises (Boykin, 2002).

Revenue from the casino and other tourist attractions has allowed the tribe to build schools and day care centers. Opportunities are available for post-secondary education. Training and workshops in crafts and skills are conducted. The success of the tribe in providing job opportunities gives the younger Choctaw reasons to stay; workforce training prepares them for the existing jobs (Boykin, 2002).

All members of the Mississippi Band of Choctaw Indians have benefited from the economic developments of recent years. Today Choctaw adults work in hotels, golf courses, factories, casinos, and other businesses on their 30,000-acre reservation. Each year, each registered tribal member receives \$1,000 from the operations. To qualify, a person must be at least one-half Mississippi Choctaw; living on the reservation is not required. Programs to treat substance abuse and mental health issues have been created. Any tribal member whether living on or off the reservation may attend college; tuition is paid by the tribe (Hagenbaugh, 2002).

The reservation for the Mississippi Band of Choctaw Indians includes eight communities. These communities are Pearl River, Bogue Chitto, Conehatta, Red Water, Standing Pine, Tucker, Crystal Ridge, and Bogue Homa. Each of these communities except Crystal Ridge and Bogue Homa contains an elementary school. Pearl River is the largest community and is home to the tribal offices. Further, Pearl River is the only community that contains all of the preschool programs (pre-kindergarten, FACE, day care, Head Start) that were the focus of this research.

### *Types of Preschool Settings for MBCI*

There are six elementary schools in the Choctaw Tribal School System. The Mississippi Band of Choctaw Indians has recognized the importance of preschool programs. A variety of preschool choices currently exist in the Pearl River area. Parents may enroll their children in pre-kindergarten, Head Start, day care, or FACE. Each program is unique in how it prepares children for school readiness and future academic success.

#### *Pearl River Elementary School Pre-Kindergarten.*

The Pearl River Elementary School pre-kindergarten program is parallel to other Mississippi public school pre-kindergarten programs. Staffing includes two full-time teachers with B.S. degrees in Early Childhood Education and two full-time assistants who have had at least 60 hours in academic college coursework. The Pearl River pre-kindergarten program is funded by a combination federal monies and tribal funds (David McCulloch, personal communication, January 24, 2008). In order to qualify for entry into the pre-kindergarten program at Pearl River Elementary School, children must be at least 25% Native American. Children are admitted to the pre-kindergarten program on a first-come first-serve basis (Alfreda John, personal communication, January 28, 2008). The Pearl River Elementary School pre-kindergarten classes use the *Mississippi Pre-Kindergarten Curriculum* as their curriculum framework. Children are exposed to the alphabet and math concepts through a mixture of whole group and small group learning center activities. Major emphasis is placed on language development, math concepts,

social/emotional development, and science concepts. Assessment of pre-kindergarten skills is documented through the use of checklists, portfolios of children's work, and other informal assessments. However, students are never retained in pre-kindergarten based upon these assessments (Rhonda Fulton, personal communication, January 22, 2008).

*Pearl River Head Start.*

The Pearl River Head Start program was developed to provide children from low-income families with quality preschool care. The Pearl River Head Start program currently falls under the administration of the Mississippi Band of Choctaw Indians' Division of Early Childhood Education. There are 102 children between the ages of three and five who currently attend Head Start in the Pearl River community. In order to qualify for entry into the Pearl River Head Start program, children must be at least 12.5% Native American. Preference is given to children of Choctaw descent. Staffing for Head Start contains four levels of teachers with the minimum of a GED or high school diploma and a maximum of a BA or BS in Early Childhood Development (See Table 1.1). The funding for Pearl River Head Start is provided by the federal government, and is licensed by the Mississippi State Department of Health. Participants in Head Start are not charged a fee to attend ((Melissa Tenhet, personal communication, July 24, 2007).



TABLE 1.1: Educational Requirements for Head Start Teachers

Staff position	Degree/Certification Requirement
Teacher	GED or high school diploma
Teacher 1	Child Development Associate Credential
Teacher 2	Associate of Arts Degree in Early Childhood Development
Teacher 3	Bachelor's Degree in Early Childhood Development

The Pearl River Head Start uses the *Choctaw Community Curriculum* which incorporates the Mississippi Benchmarks as their curriculum. The curriculum includes the Choctaw culture and language in all aspects of learning. Staff, with parental input, create and employ daily lesson plans that include literacy and language development, dramatic play, art, math, fine motor development, science, Choctaw culture, and gross motor development. Meals are served and a registered dietician incorporates traditional Native American foods into the children's nutritionally sound diets. Time is allowed for the children to express themselves through art, music, movement and dance (Melissa Tenhet, personal communication, July 24, 2007).

*Pearl River Day Care.*

The Pearl River Day Care Center was created to provide local children with a stimulating environment that would promote early childhood development. Children may be enrolled as early as eight weeks of age and may continue in the program until the age

of five. Children must be at least 12.5% Native American in order to qualify for entry into the Pearl River Day Care Center. Preference is given to children of Choctaw descent. Upon enrollment, each child and family are assessed to identify needs and specific concerns. The initial assessment includes physical, developmental and social evaluations of the child. If special services are needed, families are referred to tribal departments who provide such services. Once enrolled, children are checked for hearing, vision, developmental, mental health, speech, immunizations, and dental and physical exams (Melissa Tenhet, personal communication, July 24, 2007).

Currently, there are 129 children enrolled in the Pearl River Day Care Center. Funding for the Pearl River Day Care Center is provided by the Child Care Development Fund (CCDF) and tribal supplements. Upon enrollment in the program, each family fills out an application for financial assistance through the CCDF. Based upon certain qualifying criteria, families may receive partial or full waiver of attendance fees. For those families who do not qualify, the cost of attending the Pearl River Day Care center is capped at \$40.00 per week (Roberta Taylor, personal communication, January 18, 2008).

The Pearl River Day Care Center also falls under the administration of the Mississippi Band of Choctaw Indians' Division of Early Childhood Education. Like Head Start, staffing for the day care center contains four levels of teachers with the minimum of a GED or high school diploma and a maximum of a BA or BS in Early Childhood Development. The Pearl River Day Care Center also incorporates the *Choctaw Community Curriculum* into their daily activities (Melissa Tenhet, personal communication, July 24, 2007).

*Pearl River Family and Child Education (FACE).*

The Pearl River Family and Child Education (FACE) program was established in 2004 to serve the needs of the Choctaw community in Neshoba County. According to Gordon, FACE adult educator, a child has to be 25% Native American in order to qualify for the Pearl River FACE program. Families may enroll in the program if they already have children five years old and below, or if the mother is currently expecting a child. The Pearl River FACE program is funded through a grant provided by the Bureau of Indian Education (BIE). Families are not charged a fee for their participation. Currently, there are 21 families with 29 children enrolled in the Pearl River FACE program (Angie Gordon, personal communication, January 24, 2008).

The Pearl River Family and Child Education (FACE) program includes both home-based and center-based components. Staffing requirements vary according to position. According to Hillary Ward, FACE Coordinator, teachers that work with children must have completed a B.S. degree, preferably in Early Childhood Education. Teachers that work with parents need to have a B.S. degree in any area of education. Since the objective of FACE is to educate the family as a whole, two distinct curricula are employed. Children follow the *High Scope Curriculum*, which teaches parent and child how to interact. Children learn key experiences through play. The adult program uses the *Equip for the Future* curriculum framework. With the help of a teacher, parents set goals based on their own educational needs. Such goals might include learning computer skills, job skills, parenting skills, or achieving a GED (Hillary Ward, personal communication, January 24, 2008).

### *Summary for MBCI Preschool Settings*

The Mississippi Band of Choctaw Indians provides several choices for children in the Pearl River area to prepare them for kindergarten. The local school, Pearl River Elementary, provides a federal and state funded pre-kindergarten program. The Mississippi Band of Choctaw Indians' Division of Early Childhood Education sponsors both Head Start and day care programs for the Pearl River area. The Bureau of Indian Affairs Office of Indian Education Program provides early childhood education through the FACE program. Each program provides a variety of experiences all meant to better prepare children for the kindergarten experience, and ultimately better equip children to succeed in an academic setting. Table 1.2 presents a summary of the key components of the Pearl River preschool settings.

TABLE 1.2: A Summary of Key Components of Pearl River Preschool Settings

	<i>Pre-Kindergarten</i>	<i>Head Start</i>	<i>Day Care</i>	<i>FACE</i>
<b>Curriculum</b>	Mississippi Pre-Kindergarten Curriculum	Choctaw Community Curriculum	Choctaw Community Curriculum	For children—High Scope Curriculum Framework For parents—Equip for the Future Curriculum Framework
<b>Staff Credentials</b>	B.S. degree in Early Childhood Education	Teacher (Level 3) B.A./B.S. degree in Early Childhood Development	Teacher (Level 3) B.A./B.S. degree in Early Childhood Development	For children—B.S. degree in Elementary Education For parents—B.S. degree in education
<b>Funding</b>	Federally funded and tribal funds	Federally funded	Child Care Development Fund and tribal supplements	Bureau of Indian Education (BIE)
<b>Cost Per Child</b>	No fee	No fee	Varies according to household; maximum cost of \$40.00 per week	No fee
<b>Population Served</b>	25% Native American Age: 4 years by September 1	12.5% Native American Age: 3-5 years	12.5% Native American Age: 8 weeks-5 years	25% Native American Age: 0-8 years

## Purpose of the Study

The purpose of this study is to determine the influence of preschool settings on school achievement. Research indicates that preschool can have a tangible benefit on social, cognitive, and linguistic development of young children. Studies have also shown that quality preschool programs can provide economically less-fortunate children with the tools needed to foster the early development of the skills needed to be successful in school. The Mississippi Band of Choctaw Indians provides a variety of preschool programs for children in the Pearl River community. This research is an attempt to assess which of these preschool programs has had the most success in preparing children for kindergarten.

## Research Questions

This study has been guided by the following research questions:

1. What type of preschool settings have the 2006-2007 kindergarten students at Pearl River Elementary School experienced?
2. How did the kindergarten students at Pearl River Elementary School score on the *TerraNova* subtest scores in Reading, Language, and Mathematics as compared to the national average?
3. Is there a statistically significant difference in the *TerraNova* scores of kindergarten students at Pearl River Elementary School based on the type of preschool program they attended (day care, Head Start, pre-kindergarten, Family and Child Education program or none)?

## Justification

Research has shown that students are more successful in school when they enter school prepared to learn (Maeroff, 2006; Walston & West, 2004). Quality preschool programs increase children's school readiness and provide a foundation to begin a successful school career. Continued research and assessment of established preschool programs ensure that staff and programs remain accountable for providing quality early childhood education.

Native American children represent a unique minority group among American children. Research shows the school achievement of Native American children lags behind that of other children (Rampey, Lutkus, & Werner, 2006). Some of these deficits have been attributed to cultural and/or environmental differences of Native American children to children in other ethnic or cultural groups. Therefore, research is needed to examine the performance of Native American school children specifically to determine the effects of preschool on their academic success.

## CHAPTER II

### RESEARCH METHODS

This chapter presents the research methods used in this study. Presented in this chapter are the research design, the participant information, the context of the study, the instrumentation, the role of the researcher, the procedures followed, and the data analysis used.

#### Research Design and Justification

A causal-comparative research design was used to determine the possible effect of attending preschool on academic achievement as measured by *TerraNova* test scores. A causal-comparative design was most appropriate for this study because the participants' choices for preschool program were not manipulated by the researcher. A causal-comparative research design looks at the difference in outcomes and attempts to determine the reason for the difference (Fraenkel & Wallen, 2003).

*TerraNova* scores were chosen as the testing variable for this research. There is not a large variety of instrumentation designed to measure the achievement of kindergarten students. The Pearl River Elementary School currently uses *TerraNova* scores as an acceptable measurement of student achievement. Due to the fact that *TerraNova* tests were already in place at Pearl River Elementary School and that the scores were readily available to the researcher, it was deemed that the *TerraNova* was the most appropriate measurement available for this study.



Causal-comparative research must be used with caution in an attempt to determine the cause of the outcomes of a study (Fraenkel & Wallen, 2003). There was no way to assign preschools randomly to the participants prior to this study. In this study, relationships can be established, but the cause cannot be fully explained.

### Participants

The participants for this study were students in the 2006-2007 kindergarten class at Pearl River Elementary School. All students included in this study were of a Native American heritage, residing on or near the reservation of the Mississippi Band of Choctaw Indians, located in Neshoba County, Mississippi. Information pertaining to student performance as measured by the *TerraNova* and demographic information pertaining to type of preschool environment previously attended were provided by the administration at Pearl River Elementary School.

### Context of the Study

Pearl River Elementary School is a federally funded Native American school, accredited by the Southern Association of Colleges and Schools. The school adheres to all certification and curriculum requirements of the state of Mississippi. The regulating authority for Pearl River Elementary School is the Bureau of Indian Education (BIE), and locally governed by the Mississippi Band of Choctaw Indians. Pearl River Elementary School provides services for children from pre-kindergarten through sixth grade. The school population is approximately 500 children. All students attending Pearl River Elementary School are at least 25% Native American. Approximately 75% of the student

population is eligible for free lunch. The Mississippi Band of Choctaw Indians provides free lunches for those not eligible under free/reduced lunch guidelines.

The 2006-2007 kindergarten class at Pearl River Elementary School, used for this study, contained 74 children, taught by four kindergarten teachers. Each kindergarten teacher at Pearl River Elementary School had obtained at least the minimum requirements for certification from the Mississippi Department of Education. The student-teacher ratio for the kindergarten class was approximately 18:1. The curriculum employed during the 2006-2007 school year was the Mississippi Kindergarten Guidelines.

#### Instrumentation: *TerraNova*

The *TerraNova* (2001) is designed to measure achievement in the basic skills taught in elementary and secondary schools. The *TerraNova* is a norm-referenced, standardized achievement test. Norm-referenced means that each child's achievement in a broad area, such as language or mathematics, can be compared with other students' achievement in about the same grades. The test provides a picture of how much learning the student has achieved. The results are presented in the form of a comparison score.

The *TerraNova* (2001) is a multiple measure test requiring multiple-choice, constructed-response, and performance-assessment. The subject areas measured for grades 1-12 are Reading/Language Arts, Mathematics, Science, Social Studies, Word Analysis, Vocabulary, Language Mechanics, Mathematics Computation, and Spelling. However, kindergarten students are only tested in Reading/Language Arts and Mathematics. The range of scale scores for Kindergarten level in Reading is 355-626 (20

questions), in Language is 325-620 (20 questions), and in Mathematics 290-629 (30 questions) (*TerraNova* Norms, 1997).

The *TerraNova* tests in Reading/Language Arts and Mathematics were chosen as the test instrument for this study for several reasons. The *TerraNova* is a nationally recognized standardized test. *TerraNova* scores are often used by teachers, parents, counselors, school districts, and researchers to track and report student achievement. The Pearl River Elementary School currently uses the *TerraNova* to measure student achievement for kindergarten and first grade students. Due to the easy accessibility of student scores, combined with the reputation of *TerraNova*, the researcher decided that *TerraNova* scores would be an appropriate measurement for this study.

#### *Administering the TerraNova*

The administration of the *TerraNova* (1999) takes place over a two-day period. Schools usually administer the test in the morning on both days. The Reading/Language Arts test is administered in its entirety during the first day. The Reading/Language arts component of the Complete Battery for kindergarten students is composed of 40 items and lasts for 55 minutes. The Mathematics test is administered during the second day of testing. The Mathematics component of the Complete Battery for kindergarten students lasts 40 minutes and is composed of 30 items.

#### *Type of Questions on the TerraNova*

The Reading/Language Arts test measures a range of skills—reading comprehension, language expression, vocabulary, and reference skills. Directions,

passages, and test questions are linked by themes to provide context and stimulate interest. Comprehension items focus on the central meaning of a passage rather than surface details. Essential language, vocabulary, and reference usage skills, such as verb tense, subject-verb agreement, and basic sentence formation, are measured, as are sentence-combining and paragraph-writing skills (*TerraNova*, 2001). For Kindergarten, the objective is to measure oral comprehension, basic understanding, and introduction to print. Reading scores and language arts scores are reported separately (*TerraNova*, 1999).

Mathematics test questions allow students to take different paths to a solution and use different strategies. The tests include computation and estimation. The questions call for critical thinking, reasoning, and problem solving (*TerraNova*, 2001). For Kindergarten, objectives include number and number relations; computation and numerical estimation; measurement; geometry and spatial sense; data analysis, statistics and probability; and patterns, functions, algebra (*TerraNova*, 1999).

#### *TerraNova Test Results and Their Uses*

*TerraNova* (2001) test results are given as a scale score, national stanine, and percentile rank. *TerraNova* test results present an overview of how a child is performing in all areas of testing and allows comparisons to be made with students across the nation. Parents can compare how their child is performing within their school and against the national average.

### *Validity and Reliability of the TerraNova*

*TerraNova* (1999) is both a valid and reliable tool of measurement. The criterion-related validity and construct validity of the *TerraNova* have been established through a variety of research studies conducted by McGraw-Hill publishing company. The reliability of the *TerraNova* has been established through measures of internal consistency, item-pattern Kuder-Richardson Formula 20, and coefficient alpha.

### *Limitations of the TerraNova*

*TerraNova* (1999) provides norm-referenced data for kindergarten through twelfth grade students on a national level. Unfortunately, *TerraNova* does not supply any norm-referenced information divided by demographic information, such as ethnicity, gender, or geographic location. Comparisons used within this study cannot be done with the national average of performance of Native American kindergarten students only. Comparisons can only be made with the national average of all kindergarten students.

### Role of the Researcher

The role of the researcher in this study is strictly that of the researcher-observer. When performing research with participants of a different ethnic or cultural background, the researcher has the responsibility of conducting that research with the highest of ethical standards. For the purpose of this study, the researcher limited the collection of data to information pertaining to type of preschool attended and *TerraNova* scores of the participants. The use of this type of information minimized the possibility of bias on the part of the researcher. Any comparisons made concerning the participants of this study to

national averages cannot be fully validated due to a lack of norm-referenced statistical information for Native American groups.

### Procedure

Before conducting this research, permission was obtained from the MBCI Chief (see Appendix A). Before the Chief granted approval, the Principal of the school and the Director of Schools approved the study. Because this research involved student level data at Pearl River Elementary School, the Principal of Pearl River was asked to sign the letter of approval first. A request was made by letter to Mr. David McCulloch, the Principal of Pearl River Elementary School, to grant his approval. After obtaining his signature, the letter was forwarded to Mr. Terry Ben, Choctaw Tribal Director of Schools. After obtaining his signature, the letter was forwarded to the Chief, Miko Beasley Denson. After permission was obtained from the Chief, the study received approval from the Mississippi State University Institutional Review Board (IRB) for the Protection of Human Subjects in Research (see Appendix B).

*TerraNova* scores were obtained from Pearl River Elementary School for the kindergarten class for the 2006-2007 school year. Admission applications were obtained from the cumulative folders for the same students in order to obtain the type of preschool previously attended by each student. Some parents did not report previously attended preschool information. For these students, staff members of Pearl River Elementary School were consulted to verify whether students had attended any type of preschool or were in home-based care.

## Data Analysis

To begin the research process, data about each participant were collected and entered into a spreadsheet for initial analysis. Information was collected pertaining to type of preschool attended (pre-kindergarten, Head Start, Day Care, FACE, and home-based care), year of kindergarten (first or second), one or more types of preschool attended, and January 2007 *TerraNova* scale scores, national percentile and stanine rankings in Reading, Language, and Mathematics. Once all information had been entered, all identifying information regarding the students was rendered unidentifiable. The data were analyzed using a variety of descriptive and inferential statistical procedures, such as means, standard deviations, frequencies, and a Multivariate Analysis of Variance (MANOVA). The Statistical Program for the Social Sciences (SPSS) Version 14.0 was used as the statistical program for this analysis.

For the first part of the data analysis, the information regarding the demographic makeup of the Pearl River Elementary School 2006-2007 kindergarten class ( $n = 74$ ) was examined. Frequencies and percentages were calculated pertaining to type of preschool attended.

For the second part of the data analysis, the *TerraNova* scores for the Pearl River Elementary School 2006-2007 kindergarten class were examined. Frequencies and percentages were calculated and grouped as based upon both Percentile and Stanine ranks. Three students did not have scores for the January *TerraNova*, which left a sample size of  $n = 71$ .

For the third part of the data analysis, *TerraNova* scores for students in this study were analyzed. Deletions were made from the original list because students failed to meet certain criteria established by the researcher. Students who had attended more than one preschool were deleted from the study because it would be impossible to link achievement to a specific preschool environment. Additional deletions of students who were enrolled in their second year of kindergarten were also made. These students were omitted from the study because the researcher decided that achievement could not be easily attributed to attendance in a preschool program. The researcher then made a final set of deletions based upon under-representation of certain types of preschool environments, namely Day Care, FACE, and home-based care. Upon inspection of the data, there was not a normal distribution of scores. The deletion of two sets of scores alleviated the problem. A final data set of  $n = 47$  was retained for the analysis.

The last part of the data analysis compared the scores of the students who attended Pearl River pre-kindergarten and Head Start programs in order to determine if one program had better prepared students for kindergarten. The data analysis tested the null hypothesis that there were no statistically significant differences among the means of the *TerraNova* scores based upon the type of preschool attended. The independent variable for this study was type of preschool attended (Head Start or pre-kindergarten). The dependent variables for this study were the scores taken from the *TerraNova* Reading, Language Arts, and Mathematics tests administered on January 9-10, 2007.

The data were analyzed using a simple design (Type III SS) for Multivariate Analysis of Variance (MANOVA). The MANOVA was chosen as the most appropriate



statistical procedure for analysis of these data because it allows for simultaneous testing of more than one dependent variable. MANOVA is most appropriate when the independent variable, in this case type of preschool attended, is categorical in nature. The data were tested to see if was suitable for interpretation using a MANOVA. Normality was tested using the Kolmogorov-Sminov test. The equality of the variance-covariance matrices was tested using Box's M and Levene's Test of Equality of Error Variances. Linearity and multicollinearity among the dependent variables were tested through the examination of tolerance values obtained through a Multiple Linear Regression. One of the *TerraNova* scores was used as the dependent variable and the other two *TerraNova* scores as the independent variables. The overall MANOVA was evaluated at an  $\alpha = .05$ . Tests measuring effect size (partial  $\eta^2$ ) and observed power were also consulted.

## CHAPTER III

### RESULTS

The data analysis of this study was divided into four parts. First, demographic information was collected about the kindergarten students at Pearl River Elementary School in order to learn about their previous educational experiences. Second, the TerraNova scores from these students were examined. Third, deletions of students were made that did not fit the criteria for this study. Fourth, the scores were examined to determine if differences existed depending on what type of preschool the students previously attended.

#### Descriptive Statistics

Descriptive statistics were first analyzed using frequency and percentage tables for the participants in this study, in regard to type of preschool previously attended. Second, the scores of the 2006-2007 Pearl River Elementary School kindergarten class on the *TerraNova* were examined, divided into three subtests for Reading, Language, and Mathematics. Frequency and percentage tables of scores divided by percentile and stanine ranks were consulted.

#### *Participants*

Participants of this study were Native American students who attended kindergarten at Pearl River Elementary School for the 2006-2007 school year. Initially,

data for 74 students were collected for this study. They consisted of 40 males and 34 females.

Demographic data indicated that students had attended a variety of preschool programs (see Table 3.1). The majority of students attended either Head Start ( $n = 29$ ) or pre-kindergarten ( $n = 27$ ). A limited number of students attended child care ( $n = 5$ ) or participated in the FACE program ( $n = 3$ ). Ten students did not attend any type of formal preschool and are considered to have had a home based experience prior to entering kindergarten.

TABLE 3.1: Frequencies for Preschool,  $n = 74$

Type of Preschool	Frequency	Percent
Day Care	5	6.8
Head Start	29	39.2
FACE	3	4.1
Pre-Kindergarten	27	36.5
Home Based	10	13.5
Total	74	100.0

Upon inspection of the data, the researcher determined that some participants were not suitable for this study. Some students ( $n = 6$ ) had attended two types of preschools. Nine students were second year kindergarten students. Therefore, data for 59 students remained for analysis. A summary of the type of preschool students attended after these deletions appears in Table 3.2.

TABLE 3.2: Frequencies for Preschool,  $n = 59$

Type of Preschool	Frequency	Percent
Child Care	3	5.1
Head Start	24	40.7
FACE	0	0
Pre-Kindergarten	26	44.1
Home Based	6	10.2
Total	59	100.0

MANOVA recommends a minimum cell size of 20 observations (Hair, Tatham, Anderson, & Black., 1998). The researcher, therefore, removed the data for students who had participated in child care ( $n = 3$ ) and home based ( $n = 6$ ). This left data for 50 students to be included in the study.

The data were then examined. One student was removed because of incomplete *TerraNova* scores. Two other students were removed because they contained extreme scores that were affecting the normality of the sample. Data for the remaining 47 students were retained for analysis. A summary of the type of preschool attended appears in Table 3.3.

TABLE 3.3: Frequencies for Preschool,  $n = 47$

Type of Preschool	Frequency	Percent
Head Start	23	49.0
Pre-Kindergarten	24	51.0
Total	47	100.0

*Kindergarten TerraNova Scores for Pearl River Elementary School*

Of the 74 students attending Pearl River Elementary School kindergarten, only 71 students took the *TerraNova* in January, 2007. Students took two *TerraNova* subtests, the Reading/Language test and the Mathematics test. The Reading/Language test scores were then divided into a reading score and a language score. Therefore, students received 3 scores on the *TerraNova*: Reading, Language, and Mathematics. Scores were provided on several scales including a raw score (scale score), percentile rank, and stanine rank. From the percentile rank and stanine rank students could be compared with other students in the nation. *TerraNova* also categorizes percentile scores as Below Average (percentile scores below 25), Average (percentile scores ranging from 25 to 75), and Above Average (percentile scores above 75). A summary of the percentile ranks for the kindergarten class at Pearl River Elementary School on the *TerraNova* Reading, Language, and Mathematics test scores appears in Table 3.4.

TABLE 3.4: Summary of *TerraNova* Test Scores, based on percentile rank,  $n = 71$

TerraNova Subtest Scores	Below Average		Average		Above Average	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
TN Reading Percentile Score	33	46	24	34	14	20
TN Language Percentile Score	29	41	34	48	8	11
TN Mathematics Percentile Score	27	38	38	54	6	8

*TerraNova* also categorizes scores into stanine ranks. Stanine ranks are based upon a normal bell curve with the scores being equally divided into nine categories. These categories are Lowest Level (1), Low Level (2), Well Below Average (3), Slightly Below Average (4), Average (5), Slightly Above Average (6), Well Above Average (7), High Level (8), and Highest Level (9) (see Appendix C). A summary of the stanine ranks for the kindergarten class at Pearl River Elementary School on the *TerraNova* Reading, Language, and Mathematics test scores appears in Table 3.5.

TABLE 3.5: Summary of TerraNova Test Scores, based on stanine rank,  $n = 71$

TerraNova Subtest Scores	Lowest Level (1)		Low Level (2)		Well Below Av. (3)		Slightly Below Av. (4)		Average (5)		Slightly Above Av. (6)		Well Above Av. (7)		High Level (8)		Highest Level (9)	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
<b>TN Reading Stanine Score</b>	11	15	10	14	11	15	9	13	13	18	3	4	10	14	3	4	1	1
<b>TN Language Stanine Score</b>	4	5	12	16	9	13	17	24	13	18	8	11	6	8	0	0	2	3
<b>TN Mathematics Stanine Score</b>	8	11	9	13	10	14	12	17	16	23	13	18	1	1	2	3	0	0

\* Percent scores are rounded to whole numbers and may not add to 100%

## Inferential Statistics

The data were then analyzed to determine if there was a difference in *TerraNova* scores based upon which preschool students had previously attended. The *TerraNova* scores of the Native American students from Pearl River Elementary School were analyzed using a Multivariate Analysis of Variance (MANOVA). A MANOVA was chosen as the test for data analysis because (a) there were 3 dependent variables, and (b) the independent variable is categorical. The null hypotheses for this analysis stated that there were no statistically significant differences among the means of the *TerraNova* scores based upon type of preschool attended. The independent variable was type of preschool: Head Start or pre-kindergarten. The dependent variables were scores on the *TerraNova* in Reading, Language, and Mathematics. The means and standard deviations of the dependent variables are found in Table 3.6.

TABLE 3.6: Descriptive Statistics for Dependent Variables,  $n = 47$

<i>Dependent Variable</i>	<i>Mean</i>	<i>SD</i>
<b>TN Reading Scale Scores</b>	514.04	41.989
<b>TN Language Scale Scores</b>	503.43	37.242
<b>TN Mathematics Scale Scores</b>	464.94	46.763

### *Assumptions for Multivariate Analysis of Variance (MANOVA)*

Before a MANOVA can be used, certain assumptions must be met concerning the data. The dependent variables were tested for normality using the Kolmogorov-Smirnov test of normality. The equality of the variance-covariance matrices was tested using



Box's M and Levene's Test of Equality of Variances. Linearity and multicollinearity were tested using regression analysis.

*Normality of the Dependent Variables.*

The normality of the three dependent variables was checked using the Kolmogorov-Smirnov test. The test showed that each of the dependent variables was normally distributed at an alpha of  $\alpha > .05$  (See Table 3.7).

TABLE 3.7: Test of Normality for Dependent Variables,  $n = 47$

		Kolmogorov-Smirnov		
		<i>Statistic</i>	<i>df</i>	<i>p</i>
<b>TN Reading Scale Scores</b>	Head Start	.127	23	.200
	Pre-K	.176	24	.053
<b>TN Language Scale Scores</b>	Head Start	.112	23	.200
	Pre-K	.118	24	.200
<b>TN Mathematics Scale Scores</b>	Head Start	.143	23	.200
	Pre-K	.150	24	.170

*Equality of Variance-Covariance Matrices.*

Box's M was calculated and rendered a score of 9.020,  $p = .213$ , indicating that the covariance matrices for the dependent variables were not significantly different.

Levene's Test of Equality of Error Variances was used to examine the assumption that the variance of each dependent variable was the same as the variance of all other

dependent variables. The test indicated that the variance of each dependent variable was not statistically different from the other dependent variables (See Table 3.8).

TABLE 3.8: Levene's Test of Equality of Error Variance,  $n = 47$

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
<b>TN Reading Scale Scores</b>	2.322	1	45	.135
<b>TN Language Scale Scores</b>	.788	1	45	.380
<b>TN Mathematics Scale Scores</b>	1.454	1	45	.234

*Linearity and Multicollinearity of the Dependent Variables.*

A multiple linear regression of the dependent variables was run and the tolerance values were examined. No tolerance values fell below the threshold of .10 (see Table 3.9).

TABLE 3.9: Collinearity Statistics for Dependent Variables,  $n = 47$

<i>Model</i>	<i>Tolerance</i>	<i>VIF</i>
<b>TN Language Scale Scores</b>	.616	1.623
<b>TN Mathematics Scale Scores</b>	.616	1.623

a. Dependent variable: **TN Reading Scale Scores**

Therefore, it was concluded that the data were appropriate for analysis using a MANOVA.

### *Multivariate Analysis of Variance (MANOVA)*

A simple design was used for the MANOVA with a type III Sums of Squares regression solution. The MANOVA was analyzed using Pillai's Trace. The results of the overall test appear in Table 3.10. The null hypothesis was rejected. There was a statistically significant difference among the dependent variables based upon the type of preschool the students previously attended,  $F_{.05}(3, 43) = 8.868, p < .001$ . The effect size was measured using a partial eta squared which rendered a score of  $\eta^2 = .382$ . This statistic indicated that 38.2% of the variance in the dependent variables could be attributed to type of preschool attended. The observed power for this test was .992, which indicated that there was a 99.2% chance of finding that effect to be significant in a sample of  $n = 47$  students.

TABLE 3.10: Multivariate Tests, Type III SS, Pillai's Trace,  $n = 47$

<i>Source</i>	<i>Value</i>	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>	<i>Partial <math>\eta^2</math></i>	<i>Power</i>
<b>Preschool</b>	.382	8.868	3	43	.000	.382	.992

Follow-up univariate tests were conducted to explore the significant difference found in the overall test. A summary of these tests is found in Table 3.11. The tests of between-subjects effects did not find a statistically significant difference in the means of the *TerraNova* Reading scale scores based upon type of preschool attended,  $F_{.05} = .023, p = .880$ .

The tests of between-subjects effects did find a statically significant difference in the means of the *TerraNova* Language scale scores based upon type of preschool attended,  $F_{.05} = 12.515$ ,  $p = .001$ . The effect size, as measured by the partial eta square, gave a score of  $\eta^2 = .218$ , indicating that 21.8% of the variance in the *TerraNova* Language scale scores could be attributed to type of preschool attended. The observed power was .933, which indicated that there was a 93.3% chance of finding the effect to be significant in a sample of  $n = 47$  students.

The tests of between-subjects effects found a statically significant difference in the means of the *TerraNova* Mathematics scale scores based upon type of preschool attended,  $F_{.05} = 7.361$ ,  $p = .009$ . The effect size was measured using a partial eta square of  $\eta^2 = .141$  which indicated that only 14.1% of the variance in the *TerraNova* Mathematics scale scores could be attributed to the type of preschool attended. The observed power was .756, which indicated that there was only a 75.6% chance of finding the effect to be significant with an  $n$  of 47.

TABLE 3.11: Univariate Tests, Type III, SS,  $n = 47$ 

Source	Dependent Variable	SS	df	MS	F	p	Part. $\eta^2$	Power
Preschool	TN Reading Scale Scores	41.290	1	41.290	.023	.880	.001	.053
	TN Language Scale Scores	13882.381	1	13882.381	12.515	.001	.218	.933
	TN Mathematics Scale Scores	14141.062	1	14141.062	7.361	.009	.141	.756
Error	TN Reading Scale Scores	81058.625	45	1801.303				
	TN Language Scale Scores	49917.109	45	1109.269				
	TN Mathematics Scale Scores	86449.746	45	1921.105				
Total	TN Reading Scale Scores	12500368.000	47					
	TN Language Scale Scores	11975351.000	47					
	TN Mathematics Scale Scores	10260376.000	47					

Since there were only 2 types of preschools used as the independent variable, there was no need for any post hoc tests. The data indicated that the pre-kindergarten group outscored the Head Start group on the *TerraNova* Language Scale Scores variable. The pre-kindergarten group also outscored the Head Start group on the *TerraNova* Mathematics Scale Scores variable. However, there was no statistical evidence to indicate that one type of preschool differed from the other in the *TerraNova* Reading Scale Score variable. A summary of these results is found in Table 3.12.

TABLE 3.12: Mean Estimates for Preschool,  $n = 47$

<i>Dependent Variable</i>	<i>Preschool</i>	<i>Mean</i>	<i>Std. Error</i>
<b>TN Reading Scale Scores</b>	Head Start	515.000	8.850
	Pre-K	513.125	8.663
<b>TN Language Scale Scores*</b>	Head Start	485.870	6.945
	Pre-K	520.250	6.798
<b>TN Mathematics Scale Scores*</b>	Head Start	447.217	9.139
	Pre-K	481.917	8.947

\*Indicates statistically significant differences found

## CHAPTER IV

### DISCUSSION, LIMITATIONS, AND RECOMMENDATIONS

The purpose of this study was to determine the effect of different types of preschool settings on achievement in kindergarten. First, this study identified the types of preschool attended by students in the 2006-2007 kindergarten class at Pearl River Elementary School. Second, this study compared the *TerraNova* scores of the students at Pearl River Elementary School with the national average. Third, the study tried to determine if a relationship was found between the type of preschool attended and academic success in kindergarten as measured by the *TerraNova* test scores.

#### Type of Preschool Attended

Research has shown that the students of the 2006-2007 kindergarten class of Pearl River Elementary School have experienced a wide variety of preschool settings. Of the 74 students in the kindergarten class, only 10 students did not attend any type of preschool class. This represented only 13.5% of the class. The remaining 64 (86.5%) students did attend some type of preschool program. This information is not consistent with the study conducted by Zaslow, et al. (2005). They found that rural Native American children were more likely to be in home-based care (44.2%) than in a center-based program in the year before kindergarten. Four types of preschool programs were

represented in the 2006-2007 kindergarten class at Pearl River Elementary School. Cumulative records showed that 29 students (39.2%) had attended Pearl River Head Start prior to admission into the kindergarten program. Records indicated that 27 students (36.5%) had attended the pre-kindergarten program at Pearl River Elementary School. There were only 5 students (6.8%) who were reported to have attended the Pearl River Day Care Center. The remaining 3 students (4.1%) were participants in the Family and Child Education (FACE) program.

#### *TerraNova* Scores for Pearl River Elementary School

This study determined that the students in the 2006-2007 kindergarten class at Pearl River Elementary School did not perform as well as children nationally on the *TerraNova* subtests in Reading/Language Arts and Mathematics. The stanine ranks of the Pearl River Elementary School kindergarten class on the *TerraNova* Reading subtest were examined. Based on the evidence found in the stanine ranks, the achievement of the Pearl River Elementary School 2006-2007 kindergarten class on the *TerraNova* Reading subtest was not as high as the national average ranks. While there were students in the Pearl River Elementary School kindergarten class who scored at each stanine rank level, more of the students scored at the below average levels than was reported by norm-referenced statistical data for the nation.

The stanine ranks of the Pearl River Elementary School kindergarten class on the *TerraNova* Language subtest were examined. Based on the information provided by the stanine ranks, the achievement of the Pearl River Elementary School 2006-2007 kindergarten class on the *TerraNova* Language subtest was not as high as the national



average. Although the participants in this study performed better on the *TerraNova* Language subtest than the Reading subtest, comparison with national stanine averages still showed that fewer students scored at an above average rank than within the national population. This information is consistent with previous research that states that Native American children usually score lower than other children in language development (Marks, et al., 2003).

The stanine ranks of the Pearl River Elementary School kindergarten class on the *TerraNova* Mathematics subtest were examined. Based upon the data obtained from the stanine ranks, the students in the Pearl River Elementary School 2006-2007 kindergarten class did not score as high as national stanine average levels on the *TerraNova* Mathematics subtest. A small number of students scored above average, while a large number scored below average when compared to the national average. This is not consistent with research conducted by Mangnuson, Ruhm, and Waldfogel (2004) which found that attendance in any type of preschool program was linked to higher achievement in mathematics.

#### Effect of Preschool Setting on Academic Achievement

This study determined differences among students depending upon type of preschool setting, based on the *TerraNova* subtest scores in Reading, Language, and Mathematics. The independent variable was the type of preschool setting the children had experienced (i.e. pre-kindergarten, Head Start, day care, FACE, and home-based child care). The dependent variables were the *TerraNova* Reading Scale Scores, the *TerraNova* Language Scale Scores, and the *TerraNova* Mathematics Scale Scores. The null

hypothesis for this study stated that there were no differences among the means of the *TerraNova* subtest scores based upon the independent variable of preschool.

Inspection of the independent variable of preschool showed that some participants were not suitable for the study. Some students had attended two preschools. Other students were in their second year of kindergarten. After these cases had been removed, it was found that some of the preschools were highly under-represented. The students who attended the Family and Child Education (FACE) program, the students previously enrolled in the Pearl River Day Care Center, and the students who did not participate in any type of formal preschool program were removed from the data analysis. A small number of cases were also removed because of incomplete or extreme *TerraNova* scores. A final sample size of  $n = 47$  was retained for analysis.

The null hypothesis was tested using a MANOVA. The results of the MANOVA revealed a statistically significant difference among the *TerraNova* subtest scores based upon the independent variable of preschool ( $F_{3, 43} = 8.868, p < .001$ ). There was statistical evidence to suggest that the type of preschool attended (Pre-Kindergarten or Head Start) had an effect on at least one of the *TerraNova* subtests. Therefore, the null hypothesis for this study was rejected. The observed power of this statistical analysis was .992, indicating that there was a 99% probability that a statistical difference would be found in another sample of this size.

Follow-up univariate tests were conducted in order to investigate the effect of preschool on each of the dependent variables. The analysis suggested that there was no difference among the scores of the *TerraNova* Reading test based upon the type of

preschool attended ( $F_{1,45} = .023, p = .880$ ). Previous research has indicated that preschool has a profound effect on reading among kindergarten students no matter the program (Magnuson, et al., 2004). Specific research has also been conducted that found that public school pre-kindergarten programs have had a positive effect on reading test scores (Gormley, et al., 2005), and that Head Start programs have also had a positive effect on student achievement in reading (Currie & Thomas, 1995). However, evidence supplied by this research is not consistent with these theories.

Univariate tests suggested that there was a statistically significant difference among the scores of the *TerraNova* Language subtest based upon the type of preschool attended ( $F_{1,45} = 12.515, p = .001$ ). Approximately 22% of the variance within the mean *TerraNova* Language scores was attributed to the type of preschool the students had attended. Inspection of the mean estimates showed that the students who had attended the Pearl River pre-kindergarten program ( $M = 520.25, SE = 6.798$ ) had scored higher than the students who had attended the Pearl River Head Start program ( $M = 485.87, SE = 6.945$ ). These findings are consistent with previous research that states that public school pre-kindergarten increases student achievement in language development (Barnett, et al. 2005).

Univariate tests suggested that there was a statistically significant difference among the scores of the *TerraNova* Mathematics subtest based upon the type of preschool attended ( $F_{1,45} = 7.361, p = .009$ ). Approximately 14% of the variance within the mean *TerraNova* Mathematics scores was attributed to the type of preschool the students had attended. Inspection of the mean estimates showed that the students who had

attended the Pearl River pre-kindergarten program ( $M = 481.92$ ,  $SE = 8.947$ ) had scored higher than the students who had attended the Pearl River Head Start program ( $M = 447.22$ ,  $SE = 9.139$ ). This is also consistent previous research that public school pre-kindergarten programs increase achievement in mathematics (Barnett, et al. 2005; Gormley, et al. 2005).

### Limitations of the Study

The primary limitation of this study was related to the sample obtained from the Pearl River Elementary School 2006-2007 kindergarten class. The sample of student scores that were to be used in this study was  $n = 71$ . After an inspection of the number of students who had attended each type of preschool setting, it was determined that there were too few participants who had received only home-based care to make any statistically valid comparisons with students who had attended any type of preschool program. There were also too few participants who had attended the Pearl River Day Care Center or the Pearl River Family and Child Education (FACE) program to include them in this study. Therefore, adjustments had to be made to the research design that limited the comparison of students to those who had attended the Pearl River Elementary pre-kindergarten program and the Pearl River Head Start program.

Another limitation of this study is found within the research design itself. It was not possible to select participants to attend each preschool program. A true random selection of participants or even the matching of participants within different treatment groups was not possible for this study. Also, this study did not attempt to factor out the

influence of other variables such as teacher and/or classroom assignment in the Pearl River Elementary School pre-kindergarten program.

A third limitation of this study is the use of the *TerraNova* as the instrument of measurement for this study. Previous research has underlined various reasons why norm-referenced, standardized tests may not be an appropriate measurement for younger students, and particularly for Native American students. Standardized tests, such as the *TerraNova* are not norm-referenced for ethnic groups, and do not take into consideration issues associated with limited English proficiency, and cultural issues. Research has shown that the learning styles of Native American students differ from other ethnic groups (Chavers, 2000; Davidson, 1992; Hilberg, 2002; Rougas, 2000).

### Conclusions and Recommendations

The students in the 2006-2007 kindergarten class at Pearl River Elementary School had the opportunity to attend several types of preschool programs. The Pearl River community currently offers students four choices of preschool programs. These programs include pre-kindergarten, Head Start, Day Care, and the Family and Child Education (FACE) programs. Based on the information collected, most students attended some type of preschool program. The most frequent choices for students in the Pearl River area were the pre-kindergarten and Head Start programs. Previous studies underline the importance of attending preschool as it relates to school readiness and overall student achievement (Castillo, 2004; Maeroff, 2006; Wright, et al., 2000). The Choctaw community seems to endorse the idea that early childhood education is important. The tribal government has approved the Choctaw Community Curriculum, which addresses

the specific needs of the Choctaw population. Tribal funds and tribal supplements are also provided to aid several preschool programs. The Choctaw of the Pearl River community seem to value the importance of early childhood education programs. This study found that 86.5% of the students in the 2006-2007 kindergarten class at Pearl River Elementary School attended some type of preschool program, with the pre-kindergarten and Head Start programs as the most frequently chosen.

The scores of the 2006-2007 kindergarten class at Pearl River Elementary School were examined to see how the students compared to the national average. Research suggests that Native American children score lower than other groups of children on standardized tests, and may not be as prepared for school as other children (Rampey, et al., 2006). The 2006-2007 kindergarten students at Pearl River Elementary did not score as high as the national average on *TerraNova* subtests measuring achievement in Reading, Language, and Mathematics. A larger proportion of students evaluated in this study scored below average in comparison to the national population. This evidence supports the addition of quality preschool programs to help minimize the early deficits in academic achievement among the students of the Pearl River area.

Due to the limitations of this study, a full analysis of the effect of various preschool programs on the achievement of students enrolled in the 2006-2007 kindergarten class of Pearl River Elementary School was not possible. Due to the under-representation of students participating in each of the previously-mentioned preschool settings, a statistical analysis comparing only students previously enrolled in the pre-kindergarten and Head Start programs could be made. The results of the analysis

indicated that the students who had attended the Pearl River pre-kindergarten program had reached higher levels of achievement in both language and mathematics abilities.

There are several recommendations for further research in the area of the effect of preschool settings on achievement in kindergarten. Recommendations include the following:

1. Another study should be conducted with a larger sample size that would allow for the inclusion of the variables omitted in this study (day care, FACE, and home-based care).
2. Another study should be conducted that could account for and control the influence of extraneous variables such as teacher and/or classroom placement.
3. Research should be conducted that more closely examines the differences in the curricula of individual preschool programs.
4. Research should be conducted that would track students over a longer period of time in order to investigate the long-term effects of preschool on academic achievement.
5. Studies should be conducted using alternate assessments of achievement, such as classroom observations, teacher testimonies, portfolios, and data concerning absenteeism and classroom behavior in order to triangulate and validate student performance as measured by standardized tests, such as *TerraNova*.

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<http://www.ruralec.msstate.edu>.

APPENDIX A  
PERMISSION LETTER TO CONDUCT RESEARCH AT PEARL RIVER  
ELEMENTARY SCHOOL

Sharon Humphrey, Counselor  
Pearl River Elementary School  
470 Industrial Rd  
Choctaw, MS 39350

Miko Beasley Denson  
Mr. Terry Ben, Director of Schools  
Mr. David McCulloch, Principal

September 20, 2007

Dear Sirs,

I am the counselor at Pearl River Elementary School and I am interested in the influence of pre-school settings on school achievement. Research has shown that students who enter school prepared to learn achieve at higher levels and that the type of learning experiences before beginning school greatly influence that achievement. Statistics show that the test scores of Native American students are lower than the national average of students in school. Native American students in kindergarten are also lower than the national average. Therefore, research is needed to examine scores of Native American school children to determine the effects of pre-school on school test scores. I would like to conduct a study at Pearl River Elementary School to determine the influence of pre-school settings on school achievement. Being involved with my students on a daily basis, I have a genuine interest in providing information that can be used to increase student achievement and help our students become successful learners. If we can use student level data as predictors to determine effective instructional strategies and interventions for our entering kindergarten students, all of our students will benefit.

If granted permission for this study, I will obtain the Terra Nova test scores from the Pearl River Elementary School and enter them on a spreadsheet. Additionally, the type of pre-school attended will also be noted. The Terra Nova data are recorded in student files and on school reports to which I have access on a daily basis. Data regarding student pre-school attendance is also noted for most students. It may be necessary to gather preschool attendance data for specific students by asking teachers or other MBCI staff who are aware. It may also be necessary to ask MBCI staff information related to the preschool programs available through MBCI. The data will be rendered non-identifiable and will be entered into a computer program for data analysis. No individual will be identified and confidentiality will be maintained.

Before conducting any research at Pearl River Elementary School, permission will be obtained from Miko Beasley Denson, Director of Schools Terry Ben, and Principal at Pearl River Elementary School David McCulloch. Because this research involves student level data at Pearl River Elementary School, Mr. McCulloch, the Principal of Pearl River, will be asked to sign the letter of approval first. This letter will then be forwarded to the Director of Schools, Mr. Terry Ben. If he approves, the letter is then forwarded to Miko Beasley Denson. If Miko Beasley Denson approves and signs the letter, the research has approval of MBCI.



I am a doctoral student at Mississippi State University and would like to use this data in my dissertation research. The data I am requesting to use are data that I work with on a daily basis in my position as counselor. Before I can use the data for my research, it is required by the MSU Institutional Review Board (IRB) for the Protection of Human Subjects in Research that I be granted specific permission to use the requested data. In accordance with 34 CFR 99.31(a) (6), an exemption to regulations is hereby granted to Sharon Humphrey to work with the Mississippi Band of Choctaw Indians and the unified Reservation school system in the analysis of student level data to begin an analysis of the effectiveness of the different types of preschool programs available to children attending Pearl River Elementary School.

34 CFR 99.31(a) (6)

(i) The disclosure is to organizations conducting studies for, on or behalf of, education agencies or institutions to:

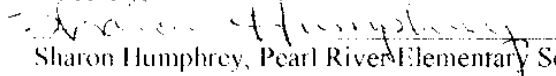
- (A) Develop, validate, or administer predictive tests;
- (B) Administer student aid programs; or
- (C) Improve instruction.

(ii) the agency or institution may disclose information under paragraph (a) (6) (i) of this section only if:

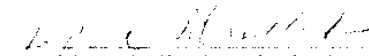
- (A) The study is conducted in a manner that does not permit personal identification of parents and students by individuals other than representatives of the organization; and
- (B) The information is destroyed when no longer needed for the purposes for which the study was conducted.


In summary, I am the school counselor at Pearl River Elementary School and I am interested in whether students who attend different types of pre-schools are better prepared for school success. The data needed are Terra Nova scores, the type of preschool attended, and information on the types of preschools available. I will use this data in my dissertation research. The results of this study will be made available to you at the completion of the study. Please feel free to contact me if you have any questions or concerns about my request to conduct this study.

Sincerely,

  
Sharon Humphrey, Pearl River Elementary School Counselor

Approval to conduct research as stated is given by:

  
David McCulloch, Principal, Pearl River Elementary School

  
Terry Ben, Director of Schools

  
Miko Beasley Denson

APPENDIX B  
INSTITUTIONAL REVIEW BOARD APPROVAL



October 16, 2007

Sharon Humphrey  
453 Sides Avenue  
Ackerman, MS 39735

RE: IRB Study #07-208: A Study of the Influence of Pre-School Settings on School Achievement

Dear Ms. Humphrey:

The above referenced project was reviewed and approved via expedited review for a period of 10/16/2007 through 10/15/2008 in accordance with 45 CFR 46.110 #5. Please note the expiration date for approval of this project is 10/15/2008. If additional time is needed to complete the project, you will need to submit a Continuing Review Request form 30 days prior to the date of expiration. Any modifications made to this project must be submitted for approval prior to implementation. Forms for both Continuing Review and Modifications are located on our website at <http://www.msstate.edu/dept/compliance>.

Any failure to adhere to the approved protocol could result in suspension or termination of your project. Please note that the IRB reserves the right, at anytime, to observe you and any associated researchers as they conduct the project and audit research records associated with this project.

Please refer to your docket number (#07-208) when contacting our office regarding this project.

We wish you the very best of luck in your research and look forward to working with you again. If you have questions or concerns, please contact me at [kcrowley@research.msstate.edu](mailto:kcrowley@research.msstate.edu) or by phone at 662-325-8543.

Sincerely,

Katherine Crowley  
Assistant IRB Compliance Administrator

cc: Dwight Hare

**Office for Regulatory Compliance**

P. O. Box 6223 • 8A Morgan Street • Mailstop 9563 • Mississippi State, MS 39762 • (662) 325-3294 • FAX (662) 325-8776

## APPENDIX C

### COMPARISON OF STANINES AND PERCENTILES

TABLE C.1: Comparison of Stanines and Percentiles

Stanine	Approximate Percentiles	Percentage of Students
9 Highest level	96-99	4%
8 High level	90-95	7%
7 Well above average	78-89	12%
6 Slightly above average	60-77	17%
5 Average	41-59	20%
4 Slightly below average	23-40	17%
3 Well below average	11-22	12%
2 Low level	5-10	7%
1 Lowest level	2-4	4%