

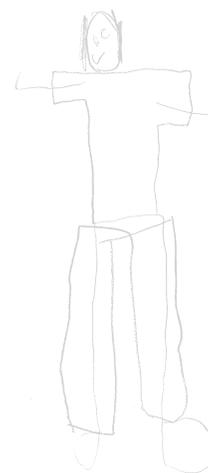


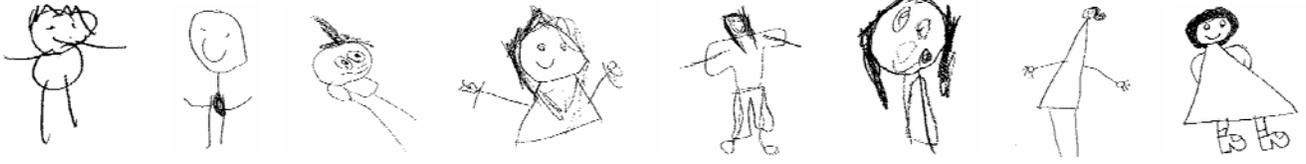
THE GEORGIA EARLY CHILDHOOD STUDY

2001-2004

Final Report

**Gary T. Henry and Dana K. Rickman
with Bentley D. Ponder, Laura W. Henderson,
Andrew Mashburn, Craig S. Gordon**





The Georgia Early Childhood Study

REPORT OF THE FINDINGS FROM THE GEORGIA EARLY CHILDHOOD STUDY: 2001-2004

Table of Contents

<u>Chapter and Title</u>	<u>Page</u>
Executive Summary	iii
Chapter 1 Study Purposes, Background, and Methods	1
Chapter 2 Development of Four-Year-Olds in Georgia: The Influence of Child and Family Characteristics	18
Chapter 3 Family Influences on the Development of Young Children	40
Chapter 4 Development of Four-Year-Olds in Georgia: Differences by Program	55
Chapter 5 Effects of Georgia Pre-K on Children in Poverty and Minorities	76
Chapter 6 Conclusions	81
References	86
Appendices	89

We would like to first acknowledge Elizabeth Stone, Katherine O'Brien, and Karen Fink DeVivo for their assistance in compiling the final report. We would like to acknowledge the hard work and dedication of all the graduate research assistants and consultants who have worked on this project. In particular, we would like to thank Betty Carithers, Terri Gabrielson, Dawn Newton-Smith, Mary Fraser, Stephanie Campbell, Patrick deHaye, Christopher Horne, Roteasha Franklin, Katherine O'Brien, Eliza McCall, and Sharon Nelson. We owe a special thanks to Nicole Andrews-Lewis, who spent many hours working with the schools. In addition, we appreciate the time and effort contributed by all of the teachers, staff, and administrators in the preschools participating in the study. We also wish to recognize the important contributions of the parents of the children in the study, who allowed us to observe and assess their children and who took their time to complete surveys. Finally, we wish to recognize the cooperation of many Georgia kindergarten teachers, school secretaries and data clerks, elementary school principals, and school system superintendents. No study such as this could be completed without the assistance of several hundred individuals across Georgia who invested their time with the hope that the information could ultimately benefit the children of the state.



The Georgia Early Childhood Study

EXECUTIVE SUMMARY

REPORT OF THE FINDINGS FROM THE GEORGIA EARLY CHILDHOOD STUDY: 2001-04

Andrew Young School of Policy Studies
Georgia State University

In 2001, the Andrew Young School of Policy Studies at Georgia State University began the Georgia Early Childhood Study (GECS) to examine the development of Georgia's four-year-olds. The study measured children's skills and behaviors that indicate the extent to which the children are prepared for success in school, including language and communication skills, cognitive development, health/physical well-being, social behaviors, and attitudes toward school and learning. In addition to analyzing the development of the children from the beginning of preschool through the end of the first grade, the study examined early school success, such as on-time promotion to the second grade.

A specific focus of this study was to understand the effects of Georgia's Prekindergarten Program (Pre-K) on four-year-olds. In 1995, Georgia became the first state to offer early education to all its four-year-olds whose parents chose to enroll them. Since Georgia's Pre-K Program is available to all four-year-olds in the state and a majority of the eligible children attend, it is difficult to find four-year-old children in Georgia who are similar in most ways to children in Pre-K but who have not attended early childhood education programs. Therefore, this study compares four-year-olds attending Georgia's Pre-K Program with children who attended other early childhood education programs. The study includes children enrolled in Head Start and children enrolled in private preschools or childcare centers, which were collectively labeled preschool. In 2002, a group of children who did not participate in formal, full-day preschool was added.

The central questions addressed in this report are:

1. How much do individual child and family characteristics influence the development of four-year-olds?
2. What are the characteristics of the families of resilient children, that is, children who beat the odds of poverty and other risk factors?

3. Does the development of four-year-olds differ by program?
4. What is the effect of Georgia Pre-K on children in poverty and minorities?

Study Methods

Probability samples of three groups of children attending preschool were included in the study during the first year: 1) children enrolled in Georgia's Prekindergarten Program (Pre-K); 2) children attending Head Start as four-year-olds (Head Start); and 3) children attending private preschools or child care centers (private preschool) who were eligible for the Georgia Pre-K Program. During the second year of the study, a fourth sample of kindergarten students who did not attend a formal, full-day preschool (Non-preschool) was added.

Study measures included direct assessments of the children's skills at the beginning of preschool, the end of preschool, the beginning of kindergarten, and end of first grade; ratings by preschool and kindergarten teachers; surveys of teachers; surveys of parents' attitudes and involvement; and observations of classroom activities. In addition, in-depth interviews were conducted with families of children living in poverty, half of whom were on par with their more affluent peers and half of whom were significantly behind.

Of the 630 children who were included in the study originally, 466 (74%) remained in the study through the end of first grade. Of the 225 children in the non-preschool sample 204 (91%) remained in the study through the end of first grade.

Summary of Major Findings

Overall Finding about Georgia's Preschools Serving Four-Year-Olds

Children in Georgia made significant gains from the beginning of preschool to the end of first grade in terms of their skills compared to national samples of children their age. Georgia's preschoolers began that school year significantly behind peers of their age across the nation. However, by the end of first grade they exceeded the national norms on their overall math skills, phonemic awareness, expressive language, and letter and word recognition. Moreover, the children increased the absolute number of correct answers on all assessments of language and cognitive skills at each testing period.

Language, Communication, and Cognitive skills

In terms of receptive language skills (PPVT), Georgia's early elementary students in the study posted substantial increases relative to national norms. These students began preschool with mean score of 92.9, well below the national norm (100). By the end of kindergarten, they matched the national average with a mean score of 100.7. However, by the end of first grade, on average, the students lost ground against the national mean and ended first grade with a mean score of 98.0.

Georgia's preschoolers were able to recognize more letters and words when they began preschool (102.7) than the national norm (100) and gained 10 additional points by the end of kindergarten (112.7), although their scores declined slightly by the end of first grade (111.1).

Georgia's preschoolers lagged significantly behind the national norm (100) in their expressive language skills at the beginning of the study (90.7). However, each year they were able to gain on the national norms and by the end of first grade had come close to matching it (98.8).

Students also posted significant gains against the national norm for children of their age on their problem-solving skills over the study period. Preschool students began that year behind (96.9) the national norm (100). However, they had met the norm by the beginning of kindergarten and well exceeded it by the end of first grade (109.3). The pattern of consistent gains, except for slight lapses in two of the language skill assessments, applies to the entire sample, including students who did not attend a formal preschool.

Influences of Individual Child and Family Characteristics

Child and family characteristics play an influential role in children's developmental processes. Primarily, mother's education level, family structure, race, and income influenced child outcomes. Some children who lived in high poverty and high-risk families were able to overcome these barriers to success with the help of their families.

- Mother's education level

Nearly one-third of the children of mothers who did not complete high school repeated either kindergarten or first grade.

Across all tests, children whose mothers had completed higher levels of education had better language and communication skills than children whose mothers had completed lower levels of education. For example, children whose mothers had not completed high school scored below the national norm (88.6) in terms of receptive language while children whose mothers had gone to college posted scores above the national norm (102.9) by the end of first grade.

Students whose mother had not completed high school scored significantly lower than children whose mother did have a high school diploma on applied problem-solving and calculation assessments. For example, on the applied problems, children of mothers with more than a high school diploma began preschool above the national norm (102.2). Children whose mother had a high school diploma (96.1) or less (86.4) scored below the norm. By the end of their first grade year, the children in all three groups were testing above the norm, on average. However, those whose mother had more than a high school diploma exceeded the norm by more than 12 points.

- Family structure

Children who lived at home with both parents since birth had acquired more language and cognitive skills than children who had not lived at home with both parents since birth. In terms of receptive language, children who lived with both parents since birth ended their first grade year above the national norm (103.0). Children who had not lived continuously with both parents since birth ended first grade behind the national norm and significantly behind their peers at 93.6. This pattern is consistent across all language standardized tests.

This pattern also held true for cognitive development, including problem-solving and arithmetic. In terms of problem-solving, children who had not lived continuously with both parents finished 7.1 points behind children who had lived with both parents.

Children who had not lived with both parents since birth were significantly more likely to be held back a grade before second grade (16.4%) than children who had lived with both parents (6.1%).

- Race

On both the receptive language and expressive language skills tests, African-American students scored significantly lower than White students. In terms of receptive language, only White students began their preschool year at the national norm or above (101.0). African-American students began preschool well below the national norm at 86.7. By the end of the first grade, Other minorities, including Hispanic and Asian-American students, showed the greatest overall gains (8 points), but fell slightly short of the national norm at 99.5. African-American students ended their first grade year at 90.9, significantly lower than both Other minority students and White students. In terms of expressive language, all children began preschool below the national norm. White students made the greatest overall gains and ended first grade above the national norm with a score of 103.7. However, neither African-American nor Other minority students approached the norms with final scores of 91.0 and 94.6, respectively.

African-American students posted scores (102) above the national norm (100) in problem-solving but lagged behind White children and Other minorities, including Hispanic and Asian-American students, by approximately 13 points.

- Income

Lower income children recognized fewer letters and words than their more affluent counterparts. Children who received TANF benefits (98) began preschool significantly behind their wealthier counterparts (106.9) in letter and word recognition. Overall, children who did not receive TANF gained an average of 9.1 points, ending first grade with a mean score of 113.5. Children in families that received TANF only gained 6.8 points over the three year period.

The average first grade readiness of children from families that received TANF was 4.6, slightly above average (4.0), while children living in families who did not receive TANF were rated as well above good (5.5).

In terms of cognitive development, economically disadvantaged children began preschool and ended first grade significantly behind their more advantaged counterparts. On an assessment of problem-solving skills, those who were from working poor families began preschool below the national norm (92.5). Their more affluent peers, averaged above the norm (103.7) when entering preschool. This pattern held through first grade. While children in the working poor category made slightly greater overall gains (12.4 v. 11.7), they still ended first grade significantly behind their more affluent counterparts.

Eight percent of the children in working poor families repeated kindergarten, compared with less than one percent of the children from families with more economic resources.

- A difference in parenting

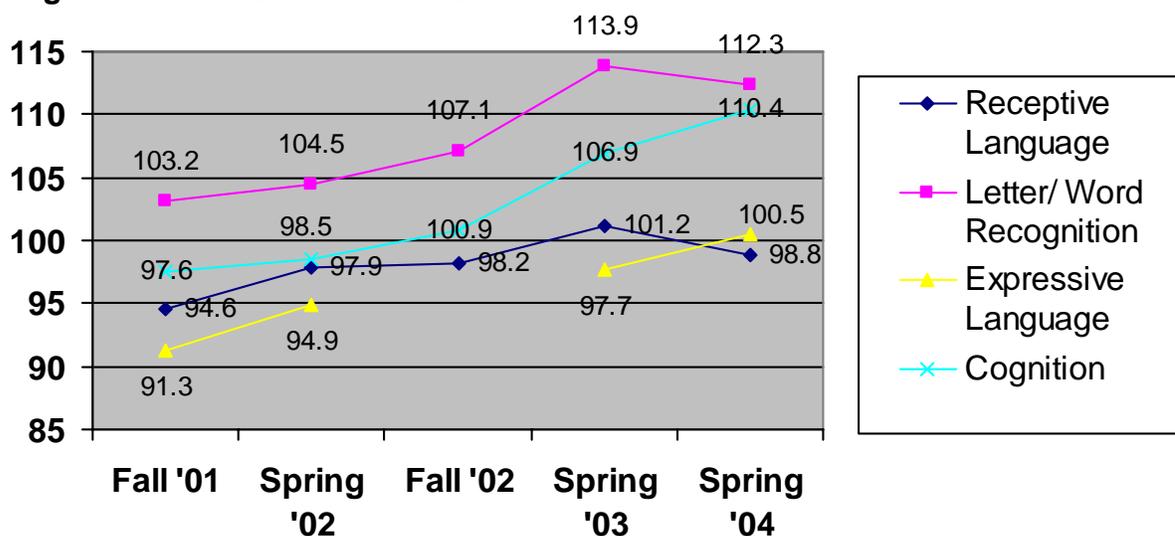
These statistics create a picture of children from economically disadvantaged homes coming to preschool with low levels of language and cognitive skills. While true “on average,” some of these children managed to beat the odds. The children who overcame the risks associated with poverty seemed to have parents who believed that their actions could make a difference in the lives of their children and who acted on this belief. These parents were likely to spend time with their children mutually engaged in meaningful activities, to communicate the importance and value of learning, and to work *with* their children’s teachers and other school personnel to find ways to support their children’s learning. These parents acted as pals *and* guides to their children. In contrast, parents of children who were unable to beat the odds tended to be overly strict or primarily viewed their role as a pal or friend rather than a guide for their child’s development.

The children from less affluent families who ended preschool behind their peers in similar economic circumstances were able to overcome some of the risks of poverty by the end of first grade. However, substantial gaps in performance remained.

Program Influences

Children enrolled in the Georgia Pre-K Program gained substantially on their peers nationally on the assessments of language and cognitive skills used throughout this study. They began preschool well behind the national norms on three of four skill assessments and finished well above the national norms on three and on par with the national norm on the fourth. Pre-K participation was associated with more positive outcomes than other preschool experiences on 11 of 16 measures, but the differences were not statistically significant during the first grade (See Figure 1).

Figure 1. Pre-K Standardized Outcomes



The effects of the Georgia Pre-K program are evident in the increases in skills using age-adjusted scores as displayed in Figure 1. It is important to note that Georgia’s preschoolers, including those who had been enrolled in Georgia Pre-K, lost ground against the national norms between the end of kindergarten and the end of first grade on two measures of language skills, although their scores remained well above those achieved at the beginning of preschool.

While comparisons with other programs are informative, the differences between children in different groups cannot be construed as an estimate of the effects of Georgia Pre-K. To the extent that parents made good choices when selecting their children’s preschools, those choices complicate the comparison of differences across programs. It is possible to say that the growth of skills for children attending Pre-K was parallel to the growth of children in privately funded preschools or in the federally funded Head Start program, when differences between the groups are controlled statistically. By the end of first grade, children who did not attend preschool had skills similar to those of Georgia’s preschoolers. The children who did not participate in preschool had some advantages in home resources, and these children’s mothers may have been less likely to work outside the home.

Attending Georgia Pre-K for children at-risk of school failure appears to reduce some of the gaps between these children and their peers from economically better-off families. The children of the working poor and children from very low income families posted greater gains if they attended the Georgia Pre-K program than those attending Head Start or private preschool. The benefits over and above those received by children attending Pre-K were generally in the desired direction for all skills tested but were significant only for the assessment of receptive vocabulary.

Preschoolers in classes with peers that had acquired higher levels of language and cognitive skills were more familiar with print materials and able to comprehend more written materials, posted higher problem-solving skills, and recognized more letters and words in kindergarten. These findings lend support to the argument for universal pre-kindergarten programs that allow children with a mixture of skills to attend the same classes.

Concluding Comments

This report provides significant evidence that the Georgia Pre-K Program does enhance children's skills by providing publicly subsidized, high quality pre-k for four-year-olds. Additionally, evidence shows that children from economically disadvantaged households and minority children begin to close the skill gap in their earliest years of schooling that has been associated with retention, drop-out rates and the achievement gap in later years.

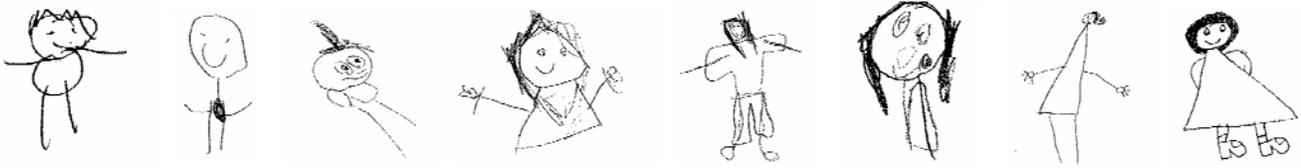
In terms of improvements for the future, this study supports four strong directions. First, the skill gap appears to have been reduced by Georgia's Pre-K Program, but some children – those from economically disadvantaged families that experience serious skills deficiencies with respect to their peers – need more support. A developmental preschool program for three-year-olds should be considered for these children. These children may require longer exposure to activities in developmentally oriented classes before they undergo rapid skill acquisition. An additional year of preschool, similar to Pre-K, may substantially reduce the skill gap and later achievement gaps.

Second, the abilities of a child's peers are strongly associated with that child's growth in skills during preschool. This is a strong argument for universal preschool, which allows the incorporation of students with different abilities in the classroom. If it becomes evident that preschool peer effects are consistent with those shown in research from K-12 environments, children with lower levels of skills will benefit more from high ability peers than children of higher levels of skills. Thus, it would be a great concern to change the universal nature of Georgia's Pre-K Program.

Third, the traditional environmental measures of childcare quality are not properly aligned with current Pre-K program goals. We need measures that capture aspects of quality that are related to children's skill development. These would allow us to revise monitoring instruments to provide greater assistance to Georgia Pre-K providers in making quality improvements that will result in even greater skill development. A study of the extent to which the new quality measures affect children's skill development may be needed to determine which measures of quality should be used in program monitoring.

Finally, we noted a downturn in children's language skills during their first grade year. In large part this appears to be associated with fewer children attaining the higher-order skills measured by standardized assessments. It is important to eliminate redundancies in instruction during the early elementary years and to focus on the development of higher-

order skills. Coordination of the early elementary learning objectives and instructional methods by the Department of Early Care and Learning, the Department of Education, Georgia's school systems, and Georgia Pre-K providers may prevent the first grade downturn in the future and promote an increase in the achievement of Georgia's students



The Georgia Early Childhood Study

The Georgia Early Childhood Study: Findings from 2001-2004

Chapter 1 Study Purposes, Background and Methods

Introduction

As our society places more and more importance on the development of young children, understanding how families and public policies interact to influence children's skills, attitudes, and behaviors has become increasingly relevant for making informed decisions about children's well-being, their educational performance, and the progress of the country. It has become widely recognized that development occurs most rapidly during early childhood and that skill development is more readily stimulated among the very young than at any other time of life. Moreover, the skills developed by young children provide the building blocks for developing additional skills that have been linked to a lifetime of benefits, including acquiring more education, receiving higher earnings, and reducing dependency on social welfare programs.

Studying the development of young children in Georgia presents a special opportunity. Georgia stands at the forefront of the country in fulfilling its commitment to universal pre-kindergarten, ranking as second in the nation in terms of providing preschool for its four-year-olds (Barnett, Hustedt, Robin & Schulman, 2004). Therefore, assessing the growth and attainment of skills of Georgia's youngest residents, as well as their attitudes toward school and learning, offers an exceptional opportunity to gather insights into the contributions of universal pre-kindergarten to children's development.

In 2001, researchers from the Andrew Young School of Policy Studies at Georgia State University began the Georgia Early Childhood Study (GECS) to examine:

1. Children's growth and development from preschool entry through the end of first grade including:
 - a. language and communication skills,
 - b. cognitive development,
 - c. health/physical well-being,
 - d. social behaviors,
 - e. attitudes toward school and learning, and
 - f. early school success;

2. Differences in children's development over time and their developmental status at the end of first grade as they are related to family and child characteristics;
3. Differences in the families and children who chose to enroll in three types of early childhood programs: Georgia's Pre-K Program, Head Start, and other full-day preschools. Additionally, differences between these families and children and those who did not participate in a formal early childhood program were examined;
4. Differences in children's development over time as well as their developmental status at the end of first grade as it related to their experiences as four-year-olds (type of preschool or not participating in preschool) after controlling for differences in family and child characteristics.

Parents can choose whether to enroll their four-year-olds in Pre-K, keep them at home, place them in the care of other family members or caregivers, or place them in other programs such as Head Start or private preschools. These choices affect their children's developmental outcomes. Some children may do better in Pre-K than other places. However, others may develop more skills while being cared for in their own homes or in other types of preschools. When parents are able to determine in which type of program their children will experience the greatest growth and development and are able to place their children in that environment, the greatest benefit for children across society is achieved through this sorting process.

The children's developmental gains reported in this study are produced jointly by families, parental choices, preschools, and other childhood experiences. This has two important implications for understanding the influence of preschool programs, such as Georgia Pre-K. First, the comparisons of developmental gains across programs do not necessarily represent the exclusive contributions of the programs to the children's acquisition of skills. Second, the best estimates of the Georgia Pre-K Program's contribution to children's development available from this study can be drawn from assessing the developmental status and growth of skills of children who were enrolled in the program. This study provides estimates of the growth of children in Georgia Pre-K and allows for comparisons with national norms on several measures for children of the same age.

The major Pre-K evaluation questions addressed in this report are:

1. How do individual child and family characteristics influence the development of four-year-olds?
2. Do certain children participating in Pre-K, such as minorities or those from poor or working poor families develop more, less or about the same as other children through the end of first grade?
3. Does the development of four-year-olds differ by program?
4. What is the effect of Georgia Pre-K on children in poverty and minorities?

To provide a more complete description of the Georgia Early Childhood Study and the information contained in this report, three aspects of the study are discussed more fully in this chapter. First, we briefly discuss the influence of families on the development of four-year-olds in Georgia as a backdrop for expectations about the influence of public programs, such as pre-kindergarten. Second, we discuss the populations from which the children in the study were drawn and with whom the children who participated in

Georgia's Pre-K Program are compared. Finally, it is important to understand the measures on which the comparisons are drawn.

Influences on the Development of Four-Year-Olds

Families, individual characteristics of young children, and the nature of the interactions that children have with others and their environments have powerful effects on children's development. Research has provided evidence about several family characteristics that influence children's development.

Family Characteristics and Children's Development

We have learned through research much about family characteristics that place children at-risk of reduced or diminished development. Over the course of a 20-year longitudinal study, Sameroff and colleagues (1987) presented the following ten social and family risk factors that negatively influence children's development: (1) maternal health problems, (2) high maternal anxiety, (3) maternal authoritarian child-rearing attitudes, (4) poor mother-child interactions, (5) mother with less than a high school education, (6) head of household with semi-skilled or unskilled occupation, (7) minority ethnic status, (8) an absent father, (9) many stressful life events during the past year, and (10) large family size. Burchinal et al. (2000) reviewed a number of studies on young children and found the following family risk factors that have a negative influence on children's development during the preschool years: poverty, low maternal education, low maternal IQ, minority ethnic status, large household size, single parent families, stressful life events, authoritarian child-rearing attitudes, and level of responsiveness and stimulation in the home environment.

Family and Child Characteristics

An important objective of the GECS study was to determine family characteristics of the children in the study that were related to children's development, measurable through survey techniques. It was important that data collection methods did not offend or intrude upon the privacy of families. In spite of the practical limitations in selecting and obtaining family characteristics measures that were included in the GECS, we were able to collect substantial relevant information. Child and family characteristics were measured through four surveys of parents and five rating instruments completed by teachers of children in the study.

Throughout the study, parents were asked to complete surveys in order to obtain accurate and up-to-date information about each child's family characteristics. These data included mother's level of education, father's level of education and parent-child interactions. These surveys also measured various characteristics of the family structure and economic resources in the home. Teachers were also asked to complete rating forms throughout the three year study. These forms measured teachers' perceptions of various characteristics of the children, including child's need for language and education assistance and their parent's participation in school events. Details of the surveys and the rating forms are included in the technical appendix.

To gain a better understanding of the influence of parents on children's development, information was gathered using in-depth interviews with the parents/caretakers of 40 children. The sample of 40 children was chosen based on family characteristics previously collected through the parent surveys and the children's baseline assessment scores. Children from economically disadvantaged families who had performed higher than expected on the baseline direct assessments and children from similar families who performed lower than expected on the baseline direct assessments were chosen for the interviews. Contrasting these two groups allowed us to assess the differences in the families that contributed to the children's successes. Trained interviewers probed parents about a variety of issues including home and community environment, parental attitudes on discipline and education, child's daily schedules, family structure, parental involvement in the child's life, as well as expectations and goals for their child. Also, parents prioritized the types of experiences that they viewed as most important for their children's success in life.

The family characteristics reported by parents and the insights gained through the in-depth interviews added to our understanding of the development of young children and the differences in the four groups of children that were included in the Georgia Early Childhood Study.

Four Groups of Children in Georgia

Georgia is a unique and important state in which to study the effects of universal pre-kindergarten as many other states are embarking on similar programs. In 1995, Georgia became the first state in the country to offer universal (non-means tested) pre-kindergarten to all children whose parents chose to enroll them. By 2001, 63,613 children, or 52% of the estimated population of four-year-olds in Georgia, participated in the program for that school year. When Head Start's 10,976 spaces for four-year-olds are included, publicly subsidized early childhood programs are provided for 61.3% of the state's four-year-olds. The third group included in the original study was four-year-olds enrolled full-time in private preschool programs or center-based childcare. A fourth group, children who did not participate in full-time, formal preschool as four-year-olds, was added in 2002.

With publicly subsidized preschool as prevalent as it was in Georgia in 2001, it was difficult to find a group of children in Georgia whose development would be similar to those enrolled in Pre-K but who did not participate in any preschool program. Even those children who did remain in the care of their family may have experiences, such as a mother who did not work outside the home, which could make their development different than that of Pre-K children.

This section describes the populations from which the four groups of children in the study were drawn – the three groups of preschoolers included in the original study and a fourth group, children who did not participate in full-time preschool as four-year-olds. It is important to note that some of Georgia's publicly funded Pre-K sites are overseen by organizations that operate private preschools and some are operated by Head Start providers. However, these programs operate quite differently and are governed by distinct regulations. In most cases, facilities are entirely separate, and classrooms are

always separate, distinct, and usually very different in terms of the resources available to the children.

Georgia Pre-K

Funded by earmarked proceeds from the Georgia Lottery, the Georgia Pre-K Program began as a program for children from lower income families in the 1993-94 school year. Beginning with the 1995-96 academic year, Georgia became the first state in the nation to offer Pre-K for all four-year-olds whose parents chose to enroll them regardless of household means. By 1996-97, the program served over 57,000 four-year-olds annually and in 2001-2002 had expanded to serve 63,613 children, 25,711 of whom were classified as at-risk (Georgia Office of Educational Accountability, 2002). The state expended approximately \$216.3 million to operate the program in the 2001-02 academic year.

The Pre-K Program is administered at the state level, but the providers may be local public schools, not-for-profit organizations, or private for-profit firms. Each provider must receive approval from the state's Department of Early Care and Learning (DECAL, formerly the Office of School Readiness) to offer one or more Pre-K classes. Children may attend any of the 3,152 Pre-K classes offered by 1,683 providers at no tuition cost to the child's family for the 6.5-hour instructional program. Private-for-profit providers offer the largest number of classes (1,460), but are closely followed by local public school systems (1,325), which together offer 88% of the classrooms. Not-for-profit providers include Head Start agencies (40 classes) and non-sectarian entities operated by faith-based organizations (Department of Early Care and Learning, 2005).

In addition to health, safety, and nutritional regulations, the state agency that administers Georgia Pre-K also regulates instructional services. To qualify as lead teachers, professional staff must have at least a technical institute diploma or associates degree in a field related to early childhood education or a college degree in a field related to child development or education. Each classroom can enroll up to 20 students and must have a lead teacher and teacher's aide in the classroom whenever the children are present. Instruction must be based on an approved curriculum, including national curricula such as High Scope, Creative, High Reach, and Montessori, or a locally developed or proprietary curriculum that must be pre-approved by DECAL (Department of Early Care and Learning, 2005).

In exchange for a flat payment per student from DECAL, providers must agree to offer full-day services (at least 6.5 hours) that follow the local school calendar. However, the flat payment, which ranges from \$2,200 to \$3,475 per student, varies slightly based on program location and lead teacher credentials. For example, payments for students in a classroom with a teacher certified in early childhood education are slightly greater than payments for students who have a lead teacher with lesser credentials. In addition, DECAL funds transportation subsidies (\$165 per student per year) for providing transportation to children classified as economically disadvantaged (Department of Early Care and Learning, 2005).

Head Start

Head Start is a national program that provides comprehensive developmental services for low-income preschool children and their families. Currently funded at approximately \$6.2 billion nationally, Head Start serves over 900,000 children and their families each year (Congressional Research Service, 2003). In Georgia, Head Start programs serve nearly 20,000 children ranging from three to five years old in 33 different programs covering 157 of Georgia's 159 counties (Georgia Head Start Collaboration Office, 2003). During the 2001-2002 school year, Georgia Head Start provided spaces for 10,976 four-year-olds. The program in Georgia is designed to address developmental goals for children, employment and self-sufficiency goals for adults, and support for parents in their work and in their roles as parents (Department of Early Care and Learning, 2005).

The children enrolled in Head Start programs in the South (including Georgia) differ from children in Head Start programs across the nation. A descriptive report of Head Start families in the FACES Study (Zill and Resnick, 1998) indicates that children in the southern region face greater risk factors than their counterparts in other regions of the nation. For example, Head Start children living in the South are the least likely to have regular healthcare coverage compared to children living in other regions. In terms of family characteristics, the primary caregiver of a Head Start child living in the South is more likely to be under the age of 29, have a lower income level, and have a lower education level than primary caregivers of Head Start children living in other parts of the nation (US Department of Health and Human Services, 2002). Considering the differences among children participating in the Head Start program nationwide, the findings for Georgia may differ from the Head Start population as a whole.

Private Preschools

Private preschools, for the purpose of this study, are schools or child care centers that offer educational and developmental programs for four-year-olds in exchange for tuition or fees for these services. The families of the children receiving the services usually pay the school or center directly. These preschools include private, not-for-profit programs, such as church-based schools, and private, for-profit programs, such as child care facilities or private college-preparatory day schools. All of the preschools included as private preschools are licensed by the state. However, the preschools vary in a number of significant ways, including the population of four-year-olds served and whether the teachers use a specific curriculum in the preschool classrooms.

The population of families and children served by private preschools in Georgia has been affected significantly by the options for parents to enroll their children in Georgia Pre-K or Head Start. Many preschools that formerly provided services to four-year-olds on a fee-for-service basis now provide educational services funded by the Georgia Pre-K Program. Using site directors' estimates of the socio-economic status of the families served in their schools, the private preschools serve more affluent families when compared to the families served by Pre-K and Head Start. Although the range of parents' socio-economic status in the private preschools was almost identical to that as reported by the Pre-K directors, the average socio-economic status was significantly higher in the private preschools. Within the private sector, the not-for-profit centers and schools were

much more homogenous than the for-profit sites. While on the whole private preschools serve families with fewer disadvantages, there are significant differences among these preschools.

Non-Preschool Sample

Throughout the report, children from the above mentioned three groups are referred to as Georgia preschoolers because these three groups comprise a probability sample of the four-year-olds in Georgia who attended a formal early education program. In addition to these three groups, a new sample of students was added to the study in the fall of 2002, their kindergarten year.

This new group of students comprises a sample of four-year-olds in Georgia who did not attend a formal early education program. However, the individual experiences of these children varied, in some cases from day to day. For example, 44% of the sample attended an organized “mother’s morning out” program routinely. In addition, 60% spent most of their weekdays at home, with relatives, or in family day care. Finally, 4% attended a formal preschool for up to 3 days a week. As these percentages indicate, many children who are classified as receiving informal care had a variety of child care experiences during the week. For example, some parents reported that their child stayed at home, but that they also attended preschool two or three mornings a week.

Throughout the report, the children from this group will be referred to as the non-preschool sample. Because these children were added to the study after preschool, we did not collect baseline data from the fall in which they turned four-years-old. Therefore, these children are not included in several of the analyses that include measures taken during fall 2001.

Sample Selection: Preschool Year (Fall 2001- Spring 2002)

A probability sample of four-year-olds receiving instructional and supervisory services under the auspices of Head Start, the Georgia Pre-K Program, and private preschools was selected. For the study, 135 sites were chosen, and 126 agreed to participate. Children were sampled after obtaining parental consent (75% or more consented in most sites). The total sample size for the first year was 630. This includes 353 children from Georgia Pre-K (56% of the sample), 134 children from Head Start (21% of the sample), and 143 children from private preschool (23% of the sample).

Sample Selection and Follow-up: Kindergarten Year (Fall 2002-Spring 2003)

At the beginning of the second year of the study, children from the preschool year were located in their kindergarten classrooms. Georgia State University (GSU) researchers tracked the children by sending locating forms to sites that preschool teachers identified as probable kindergarten locations. Administrators at these schools either verified that the children in the study were attending the school or gave information about the child’s current school. Only those children who had remained in their preschool program for the duration of the 2001-2002 school year (approximately nine months) and were located in a

Georgia school were included in the second year analysis. The total number of children eligible for continuing in the study was 570.

Of the 570 children eligible, 449 (79%) were located in a Georgia kindergarten classroom during the fall 2002. In addition, a new sample of 225 children who did not attend formal preschool was selected. These children were sampled from the kindergarten classrooms in which the first-year children were currently enrolled. Once a first-year child was located in a kindergarten classroom, consent forms that included four brief questions about the children’s previous schooling were mailed to the teacher and distributed among the remaining children in that particular class. Children were then sampled based upon confirmation of parental consent and responses indicating that the child had been eligible to enroll in Pre-K but had not attended a full-time, formal preschool the previous year.

Sample Follow-Up: First Grade Year (Fall 2003-Spring 2004)

During the first grade year, students were located using the same methods that were used to track the children the previous year. Of the 795 children who were eligible for the study in kindergarten, 678 (85%) were located in the fall of 2003. Of the 678 students that were located, 670 (99%) were individually assessed by trained professionals in the spring of 2004.

Table 1.1 provides a breakdown of the number of eligible children included in the study data from the beginning of preschool through the end of first grade.

TABLE 1.1. NUMBER OF CHILDREN IN GECS PER TESTING PERIOD

	Fall 2001 Preschool	Spring 2002 Preschool	Fall 2002 Kindergarten	Spring 2003 Kindergarten	Fall 2003 1 st Grade	Spring 2004 1 st Grade
Eligible	570	570	795*	793**	786**	785**
Tested	570	539	670	661	N/A	670
GA Pre-K	325	311	264	262	N/A	272
Head Start	119	108	92	94	N/A	97
Private	126	120	89	93	N/A	97
Non- preschool	N/A	N/A	225	212	N/A	204

* In the fall of 2002 (kindergarten), 570 children were eligible to continue the study and 225 children with no formal preschool experience were added to the study.

**The decreases in the number of eligible students in the spring of 2003, fall of 2003 and spring of 2004 were due to parental or school withdrawal from the study.

For a more complete understanding of the similarities and differences in the four groups of children included in the study, we describe characteristics of the children, their parents, and their families in the next three sub-sections of this chapter. For each characteristic, we note differences between any of the groups that are statistically significant.

Characteristics of Study Children

The average age of participants upon their entry into preschool was 4.5 years and was 5.5 upon their entry into kindergarten (Table 1.2). There was no difference in the average ages of participants enrolled across the three preschool program types. There was also no difference in the average ages between those children enrolled in preschool and the children not enrolled in any type of preschool. However, the majority of children enrolled

TABLE 1.2. CHARACTERISTICS OF CHILDREN PARTICIPATING IN THE GEORGIA EARLY CHILDHOOD STUDY

Demographic Characteristic	Georgia Pre-K n=325	Head Start n=119	Private n=126	Non Preschool n=225	Overall n=795
Age upon preschool entry (SD)	4.5 (0.29)	4.5 (0.26)	4.5 (0.29)	N/A	4.5 (0.28)
Age upon kindergarten entry (SD)	5.5 (0.29)	5.5 (0.26)	5.5 (0.29)	5.5 (0.27)	5.5 (0.29)
Sex					
% Male	50.8	52.3	59.2	48.0	51.7
% Female	49.2	47.7	40.8	52.0	48.3
Race					
% White ^{a, b}	50.5	29.8	64.2	76.6	57.7
% African-American ^a	39.5	57.0	26.9	16.5	33.0
% Hispanic	2.7	4.1	1.0	5.4	3.6
% Other	7.3	9.0	7.9	2.2	4.9

^a Children from Head Start differ significantly from children who attended Georgia Pre-K, private preschool, and no formal preschool.

^b Children from Georgia Pre-K differ significantly from children who attended Head Start and no formal preschool.

in Head Start (60%) were African-American, while the majority of children enrolled in private preschools (66%) were White. In Georgia Pre-K, the sample was split more evenly between White and non-White participants. The largest difference between White and non-White participants was found in the non-preschool sample with a large majority of White children represented (80%). All four groups of children had similar percentages of Hispanic children and children grouped in the “Other minorities” category.

The proportions of boys and girls in the study groups differed as well. In Georgia Pre-K, the percentage of males and females was equal. However, in Head Start and private preschools, there were disproportionately more male students than female students. One possible explanation of this difference is that parents may be more likely to identify academic and behavioral issues among boys than girls, which may lead parents to seek preschool programs that they believe can offer specialized services. The larger percentage of female students than male students without a formal preschool experience is consistent with this explanation. Another, alternative explanation is that parents’ views about appropriate experiences are not the same for four-year-old boys and girls.

Parental Characteristics and Interactions

The levels of parental education and other parent characteristics that are associated with children’s development differ significantly across the four groups of children in Georgia

(Table 1.3). The average education levels of mothers and fathers of children who attended private preschools or did not attend preschool were significantly higher than those of children enrolled in Georgia Pre-K and Head Start. Furthermore, mothers and fathers of children who attended Head Start had significantly lower levels of education than their counterparts in Georgia Pre-K. Head Start children had the highest proportion of parents with less than a high school diploma. The children who attended Head Start also had the highest proportion of teenage mothers (38%), significantly more than

TABLE 1.3. PARENT CHARACTERISTICS OF CHILDREN PARTICIPATING IN THE GEORGIA EARLY CHILDHOOD STUDY

Family Characteristic	Georgia Pre-K n=326	Head Start N=119	Private n=126	Non Preschool n=223	Overall n=794
Mothers Education					
% Less than HS ^a	6	30	1	5	7
% HS Degree ^c	63	64	50	53	59
% BA or More ^{a,b}	29	4	48	40	32
Fathers Education					
% Less than HS ^a	8	21	3	6	8
% HS Degree	65	66	58	54	62
% BA or More ^g	27	9	38	38	29
Total Gross Income ^f (1-10 range) (Mean)	4.7	2.2	6.7	6.1	5.2
Means Tested Benefits					
% TANF ^a	4.3	17.0	2.0	3.6	5.7
% Food Stamps ^{a,c}	18.0	50.7	2.1	10.2	17.9
% SSI	4	4	1	1	3
Unemployment Insurance (%)					
Currently Insured ^a (%)	97.0	82.7	97.1	97.1	95.1
Insurance Type					
% Medicaid ^a	18.7	59.8	8.1	8.53	20.7
% PeachCare	14.8	15.7	10.8	12.4	13.0
% Employer ^{a,c}	54.1	20.7	71.2	58.9	53.2
Teenage Mother ^a (%)	8.9	19.0	2.6	5.9	8.3
Sufficient Food (1-4 range) (Mean)	2.9	2.8	3.0	2.9	2.9

^a Children from Head Start differ significantly from children who attended Georgia Pre-K, private preschool, and no formal preschool.

^b Children from private preschool differ significantly from children who attended Georgia Pre-K and Head Start.

^c Children from Pre-K differ significantly from children who attended Head Start, private preschool and no formal preschool.

^d Children from Head Start differ significantly from children who did not attend formal preschool.

^e Children from Georgia Pre-K differ significantly from private preschool children.

^f All groups differ significantly from each other except children from private preschool and children with no formal preschool.

^g Children from Head Start differ significantly from children who attended private preschool and children who did not attend formal preschool.

the children enrolled in Georgia Pre-K, private preschools, and the children without a formal preschool experience.

Families with children who attended private preschool and with children who did not attend preschool had a significantly higher household income than the families with children enrolled in Georgia Pre-K and Head Start. There was also a significant difference in household income among families with children enrolled in Head Start and

the families with children enrolled in Georgia Pre-K. Differences in family economic status were also found to be significant across the four groups, with more children enrolled in Head Start being from families that received benefits such as TANF (21%) and Food Stamps (53%).

Results also indicated that there were children in Georgia Pre-K with family backgrounds similar to children in Head Start and private preschools. For example, the proportion of children who received Medicaid, a means tested federal program, was significantly higher among Head Start children than children enrolled in Georgia Pre-K and private preschools. However, the proportion of children in Head Start who received PeachCare, a state-funded insurance program that subsidized health care costs for low-income families not qualifying for Medicaid, was nearly equal to the proportion of children in Georgia Pre-K who received these benefits. For the duration of this report, these children will be qualified into two categories: 1) TANF recipients, and 2) working poor. The ‘working poor’ classification is for families that still qualify for some type of means tested benefits, such as Food Stamps, but have earnings too high to qualify for TANF.

Family Structure

The family structure of the four groups of children enrolled in the study was quite similar in many ways (Table 1.4). For example, there were no differences found between the four groups when comparing the number of adults in the home. There was also no significant difference found in the number of siblings when comparing the four groups.

TABLE 1.4. FAMILY RISK CHARACTERISTICS OF CHILDREN PARTICIPATING IN THE GEORGIA EARLY CHILDHOOD STUDY

Family Characteristic	Georgia Pre-K n=325	Head Start n=119	Private n=126	Non Preschool n=225	Overall n=795
Child lived with both parents since birth ^a (%)	71.6	38.9	76.2	78.5	70.2
Family Arrangement					
% Married ^{a, b}	68.6	37.7	80.0	71.8	67.6
% Significant Other ^a	8.1	6.5	3.8	21.2	10.8
% Divorce	6.3	7.8	7.6	2.0	5.5
% Widow/separated	1.5	3.9	1.9	1.2	1.8
% Never married/not living with partner	8.5	15.6	2.9	4.1	6.4
Number of Adults living at Home (1-3) (Mean/SD)	1.9 (0.67)	2.0 (0.71)	1.7 (0.86)	2.0 (0.83)	2.0 (0.44)
Number of Siblings (0-12) (Mean/SD)	1.7 (1.4)	2.1 (1.5)	1.7 (1.4)	1.9 (0.56)	1.7 (1.2)

^a Children from Head Start differ significantly from children who attended Georgia Pre-K, private preschool, and no formal preschool.

^b Children from Georgia Pre-K differ significantly from children with no formal preschool.

A major distinction found among the four groups was the proportion of children who had lived with both parents since birth. Half as many children who attended Head Start had lived with both parents since birth as had children in Georgia Pre-K, private preschools, and children with no preschool.

There is also a significant difference in the marital status of the adults in the home when analyzing the family arrangement for the four groups of children. For example, children in Head Start were significantly less likely to live in a home with married adults when compared to the other three groups of children.

Measuring Early Educational Success and Other Child Outcomes

A high priority objective for the Pre-K Program is to prepare each child for success in school. Unfortunately, school success can be assessed only after a number of years. In this study, we have measured numerous indicators of early school success and leading indicators of later school success, such as promotion to second grade on time. Being prepared for school is a complex process that experts believe requires a mix of cognitive, communication, and social skills, as well as good health and physical well-being (Kagan, Moore, & Bradekamp, 1995). Therefore, the GECS measured multiple outcomes that are considered to be indicators of school success, many of which were measured at preschool entry and at the end of each school year. These data, which cover all of the dimensions that have been identified as important indicators of school readiness, came from several sources including direct assessments by trained staff, teachers' ratings, and parents' ratings.

Study Measures

The Georgia Early Childhood Study began in 2001 as a study of children's development and an evaluation of the influence of the Georgia Pre-K Program on that development. Measures were intended to collect developmental outcome information as comprehensively and accurately as possible, while being mindful not to take too much of any individual's time. Measures were taken periodically from the beginning of the children's preschool year (fall 2001) through the completion of first grade (spring 2004).

For comprehensiveness, we measured characteristics in four of the dimensions recommended by the National Education Goals Panel on School Readiness: cognition, language development, social and emotional development, and health and physical well being (Kagan, Moore, and Bradekamp, 1995). For accuracy, we utilized three of the best sources available to assess children's readiness:

- Trained professionals to individually administer widely used developmental assessments with each child in the study;
- Parents who provided the researchers with essential family information; and
- Teachers who directly evaluated each child's behavioral, social, communication, and academic skill levels.

Study data were collected through parent surveys, teacher surveys, direct assessments of children by independent assessors, direct observations of classroom quality and teacher-child interactions, and teachers' ratings of children's social, communication, and pre-academic skills.

An overview of the instruments and ratings used in the study is provided in Table 1.5. In addition to these measures that provided an overall developmental picture of the children in this study, we obtained school placement information, including grade level, from the Georgia Department of Education in fall 2004.

TABLE 1.5. GEORGIA EARLY CHILDHOOD DEVELOPMENTAL ASSESSMENTS (FALL 2001-SPRING 2004)

Developmental Area	Instrument	Method
Cognition & General	Color Bears (Zill & Resnick, 1998)	Direct Assessment
Knowledge	Woodcock Johnson Test of Achievement-III (WJ) (Woodcock, McGrew & Mather, 2001; Applied Problems, Math Fluency, and Calculations subtests)	Direct Assessment
	Number Naming and Name Writing (Bryant, 2001)	Direct Assessment
	Academic (pre-math & pre-reading) skills	Teacher Survey
Language Development	Receptive language (vocabulary): Peabody Picture Vocabulary Test-III (PPVT), Form A and Form B (Dunn & Dunn, 1997)	Direct Assessment
	Recognition of letters and words: Woodcock Johnson Test of Achievement – II (WJ) (Woodcock, McGrew & Mather, 2001; Letter-Word Identification subtest)	Direct Assessment
	Expressive language: Oral and Written Language Scales (OWLS) (Carrow-Woolfolk, 1995; Expressive subtest)	Direct Assessment
	Story and Print Concepts (Zill & Resnick, 1998)	Direct Assessment
	Phonological awareness: The Comprehensive Test of Phonological Processing (CTOPP) (Wagner, Torgesen, & Rashotte, 1999; Elision and Sound Matching subtests)	Direct Assessment
	Communication Skills	Teacher Survey
	Referral to Language Assistance Services	Teacher Survey
Social and Emotional Development	Composite of Classroom behaviors: Social behaviors, withdrawn behaviors, aggressive behaviors, and Positive attitude toward school and learning	Teacher Ratings
	Children’s Attitude towards school (CATS) (Mashburn and Henry, 2004)	Direct Assessment, Teacher Survey, & Parent Survey
Overall School Readiness	Readiness Score	Teacher Rating
Health and Physical Well-being	Items adapted from Family and Child Experiences Survey (Zill and Resnick, 1998) and National Early Childhood Longitudinal Study (1999)	Teacher Survey & Parent Survey

Study Measures: Preschool Year (2001-2002)

The assessment battery was carefully selected to include norm referenced assessments and other measures of children’s skills. The battery provided valid and reliable information about children’s cognitive, math, and language skills, including vocabulary, letter and word recognition, expressive language, and phonemic processing. Georgia State University researchers were trained on each standardized instrument in the battery and were not allowed to assess any child in the study until they were observed and approved for independent testing on all measures. Once approved, these researchers individually administered the assessment battery to each child in the sample. Between the dates of September 10 and October 10, 2001, 630 children were assessed. The same assessments were re-administered between the dates of April 11 and May 30, 2002 in order to measure development through the preschool year.

During the first year of the study, children were assessed using a variety of nationally standardized tests which measured basic pre-math skills (WJ -III; Applied Problems subtest), receptive language (PPVT-III, Form A), expressive language (OWLS), and letter and word recognition (WJ-III Letter-Word Identification subtest). A series of nationally recognized basic mastery skills tests were also administered including Number Naming, Name Writing, and Color Bears. Table 1.6 shows the assessment battery for each year of the study and how it changed.

TABLE 1.6. DIRECT ASSESSMENT USED FOR FALL 2001-SPRING 2004

Instrument	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Spring 2004
Color Bears	X	X	X		
Applied Problems subtest	X	X	X	X	X
Woodcock Johnson Test of Achievement-III Letter-Word Identification subtest	X	X	X	X	X
Woodcock Johnson Test of Achievement-III Calculation subtest				X	X
Woodcock Johnson Test of Achievement-III Math Fluency subtest				X	X
Woodcock Johnson Test of Achievement-III Number Naming	X	X	X		
Peabody Picture Vocabulary Test-III (Form A)	X	X			X
Peabody Picture Vocabulary Test-III (Form B)			X	X	
Oral and Written Language Scales	X	X		X	X
Story and Print Concepts	X	X	X		
Sound Matching subtest			X	X	
Comprehensive Test of Phonological Processing Ellison subtest			X	X	X
Comprehensive Test of Phonological Processing Children’s Attitude Towards School					X

In addition to the direct assessments, teachers and parents were asked to rate other dimensions of the children’s development, including social and emotional behavior and health. Children’s behaviors and attitudes were measured using teachers’ ratings, including a composite of children’s attitudes toward school, task persistence, and

curiosity; a composite index of teachers' ratings of the child's respect for authority, ethical behavior, and refusal skills; a composite of measures indicating the frequency with which the child was withdrawn; and a composite of measures indicating the frequency with which the child behaved aggressively. Teacher surveys and rating forms were mailed directly to the teachers in the fall and the spring of the preschool year (2001-2002).

Additionally, parents were asked to complete surveys. Initially, the surveys were delivered via their child's teacher in fall 2001. For non-respondents, telephone surveys were administered in spring 2002. Parents who did not complete the telephone survey were mailed a written version of the survey in summer 2002. Response rates varied from 84% for the fall parent survey to 75% for teacher surveys to 86% for both spring and fall direct assessments.

In the winter of the preschool year, trained observers conducted classroom observations to measure contextual features of the children's learning environments, ranging from the structural components of the classrooms to the interactions between and among the children and teachers. Observers rated the quality of the classroom and program environment using the *Early Childhood Environment Rating Scale – Revised* (ECERS-R) (Harms, Clifford, & Cryer, 1998), an observational measure of the developmental appropriateness of the classroom environment, and the *Assessment Profile for Early Childhood Programs* (AP) (Abbott-Shim & Sibley, 1998). Observers also used the *Caregiver Interaction Scale* (CIS) (Arnett, 1989) to provide an additional measure of the quality of the interactions between the children and the teaching staff.

Georgia State University researchers trained observers on the procedures required to conduct classroom observations in a manner that yielded reliable data. Observers participated in two full-day training sessions in which they received extensive instruction on the three observation instruments. In addition, observers practiced by scoring video vignettes, discussed issues related to standard classroom observation procedures, and were instructed on procedures specific to the evaluation. Observers were required to observe and rate at least two preschool classrooms that were not part of the GECS with an experienced observer, who provided an "anchor" rating, followed by a debriefing period. During this time the two observers reviewed their scores and determined consensus ratings. After the observers demonstrated adequate reliability, they were approved to conduct unsupervised observations.

Study Measures: Kindergarten Year (2002-2003)

After obtaining parental permission for the non-preschool sample, trained professionals individually assessed 668 children in fall 2002 and 659 children in spring 2003 using nationally recognized developmental assessments. The students were assessed in the fall between the dates of September 25 and November 25, 2002 and in the spring between the dates of April 10 and May 23, 2003. The assessment battery was altered from the previous academic year. In the fall 2002 and spring 2003, a test of phonological awareness (CTOPP) was added to the assessment battery. The CTOPP is viewed as a reliable predictor of future reading success and was developed for individuals ranging from kindergarten to college. Test Form B was used for the PPVT-III, instead of Test

Form A during the second year testing. In the fall, the OWLS was removed due to length of testing time. In the spring 2003, the basic mastery skills tests (Color Bears, Number Naming, and Story and Print Concepts) were removed because the children's development had exceeded the test's capabilities. Two subtests of the Woodcock-Johnson III, Math Fluency and Calculation, were added to the assessment battery as more age appropriate tests of math skills. The OWLS was also added back into the testing battery in spring 2003.

Teacher rating forms were mailed to the kindergarten teachers in fall 2002. Of the 674 children found, 570 (85%) rating forms were completed by the teachers and returned in the fall of 2002. In the spring of 2003, 497 (74%) rating forms and surveys were completed by the teachers and returned. Surveys were distributed to parents in the fall of 2002 via their child's teacher. The parents who did not complete a survey in the fall were given a survey via telephone in the spring, and parents who did not complete a telephone survey were mailed a survey in the summer of 2003. Altogether, 412 (61%) parents completed a survey.

After attending a training session that was similar to the one in the preschool year, Georgia State researchers conducted classroom observations. The goal of the observations was to measure contextual features of the children's learning environments, ranging from the structural components of the classrooms to the interactions between and among the children and teachers. In the winter of the kindergarten year, observers rated the quality of the classroom and program environment using the ECERS-R, CIS, and a new assessment instrument called the *Assessment of Practices in Early Elementary Classrooms (APEEC)* (Hemmeter, Maxwell, Ault, & Schuster, 2001). This assessment tool was designed to measure practices in general education classrooms in kindergarten through third grade.

Study Measures: First Grade Year (2003-2004)

The assessment battery for the first grade year was very similar to the battery used for the spring of the kindergarten year. However, Test Form A was used for the PPVT-III and the Children's Attitude Toward School (CATS, Mashburn and Henry, 2004), a new assessment tool, was introduced to investigate the children's attitudes towards a variety of school activities and specific subject matters.

Teachers were mailed rating forms in the fall and the spring of the first grade year. Rating forms were completed for 393 (50%) of the children by first grade teachers in the fall, while 496 (63%) forms were completed in the spring (Table 1.7). Based on geographical location and demographic information of the schools, 304 teachers were selected and completed a teacher's CATS form in the spring of 2004. Parent surveys were delivered via children's teachers. The parents who did not complete the original survey were given a survey via telephone. Those parents who did not complete a telephone survey were mailed a survey in the spring of 2004. In all, 304 (39%) parent surveys were completed.

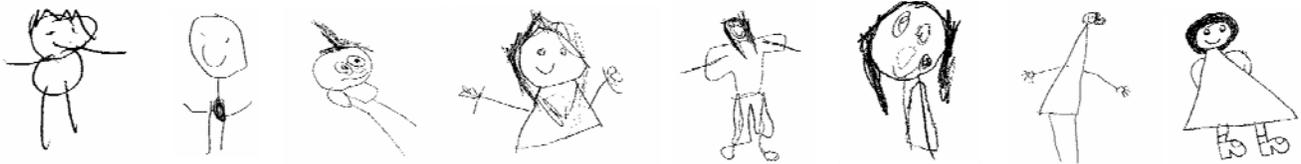
TABLE 1.7. NUMBER OF CHILDREN IN GECS PER TESTING PERIOD

Number of Children	Fall 2001 Preschool	Spring 2002 Preschool	Fall 2002 Kindergarten	Spring 2003 Kindergarten	Fall 2003 1st grade	Spring 2004 1st grade
Tested	570	539	670	661	670	670
Parents Survey Returned	479	330	411	N/A	N/A	304
Teacher Survey Returned	N/A	128	N/A	296	N/A	408
Teacher Rating Form Returned	535	443	572	304	393	496

Of the 668 children who were assessed in the spring, 40 were asked to participate in in-depth interviews as a part of this study. The sample of 40 children was chosen based on the family characteristics previously collected through the parent surveys and the children's baseline assessment scores. Children from disadvantaged families who had performed higher than expected on the baseline direct assessments and children who performed lower than expected on the baseline direct assessments were chosen. Interviews were conducted with the children's parents in order to ascertain parental attitudes and to acquire a better understanding of the interactions between parents and their children. Interviews centered on a variety of issues including home and community environment, parental attitudes on discipline and education, child's daily schedule, family structure, parental involvement in their child's life, and expectations and goals for their child. The parents were then asked to complete an exercise that measured their attitudes and views of their child's success and ways to foster their success. Each of the interviews was taped and transcribed for further analysis.

Report Organization

This report contains five additional chapters. Chapters two through five focus on six sets of measures: language and communication skills, cognitive skills, attitudes toward school and learning, social behaviors, health and well-being, and school placement. In chapter two, we describe the differences in children's development that are associated with their race, sex, age, and family characteristics. In chapter three, we take a closer look at resilient children from economically disadvantaged families. In chapter four, the developmental differences between children attending Georgia Pre-K and other children in the study are compared through a comprehensive analysis of data collected over the three year period. Chapter five assesses the extent to which Georgia Pre-K affects the development of different groups of children in different ways. In particular, we investigate whether groups of children who tend to under-perform in school receive greater benefits from Pre-K. Chapter six, the final chapter, summarizes the study's major findings and begins to interpret the results.



The Georgia Early Childhood Study

Chapter 2

Development of Four-Year-Olds in Georgia: The Influence of Child and Family Characteristics

The Georgia Early Childhood Study (GECS) focuses on children's skill development, attitudes toward school and learning, and health, with a particular emphasis on the influence that preschool experiences have on children's development. Children's development is a complex process that is influenced by a number of factors including experiences in preschool, interactions with parents, siblings, and peers, home environment, and characteristics of individual children. Child characteristics that are associated with development include sex, age, race, and whether the child has special developmental needs. Characteristics of the family that play a role in the development of young children include parental levels of education, socio-economic status, parent-child interactions, and the family structure. Each of these family characteristics can directly influence children by providing resources and a home environment that either enhance or detract from children's development.

Data on a number of key indicators measuring children's well being from the 2000 United States Census suggest that children in Georgia are more at-risk than children from most of the other states in the U.S. For example, 17.1% of children in Georgia who are under eighteen years of age live below the poverty line as compared to 16.6% of children nationally. The percentage of families headed by a single parent is slightly higher in Georgia (30%) than in the national average (28%). Children in Georgia are also more likely to be born to teenage parents than children in the other states. In this study sample, 12% of the children were born to teenage mothers.

Taking into consideration a number of indicators of child well-being, children in Georgia ranked 41st out of 50, suggesting that the population in the Early Childhood Study experience greater home and family risks than children in most other states (Kids Count, 2003). With so many children at-risk for experiencing developmental delays and subsequent academic and behavioral difficulties in school, high quality early education programs, such as the Georgia Pre-K program and Head Start, can be important resources for achieving early educational success.

Although four-year-olds in Georgia began their preschool experiences below the national norms for three out of four standardized assessments, by the end of first grade these children were close to or above the national norms for all four assessments. In addition, the children continued to improve their scores on all of the standardized assessments throughout the study. However, the children lost ground with respect to the national norms on several assessments during their first grade year. By the end of the first grade, nearly 10% of the children in the GECS had been retained at least one year. These children were highly concentrated within the group of children whose mothers had not completed high school.

In this chapter, the effects associated with mother's education level and the presence of both parents in the home on the child's development of language and cognitive skills are detailed. Children whose mothers did not have a high school diploma entered preschool significantly behind their peers, and this significant difference persisted through the first grade. Similarly, children who had not lived with both parents since birth also began preschool significantly behind their peers who had lived with both parents since birth and were unable to close the gap by first grade. Finally, minority status and receipt of federal aid, specifically Temporary Assistance for Needy Families (TANF), also were associated with persistently lower levels of development.

The remainder of this chapter will examine relationships between child and family characteristics and children's development from the beginning of preschool to the end of first grade. We begin by describing children's progress and status in language development and communication and then turn to other skills, including cognitive and general knowledge, social behaviors, health and well being, and overall school readiness. For all standardized assessments, we discuss the average number of correctly answered questions for all of the children in the study and breakdown those numbers to compare different groups of children. In addition, we present the standardized scores to provide an indication of how Georgia's early elementary students in the study compare to national samples of children. For both measures, we focus on significant differences between groups of children rather than a comprehensive description of the scores (for the complete set of breakdowns, see Appendix A through D). Finally in this chapter, we address the children's progress in school, focusing on timely promotion into the first and second grades.

Language and Communication Skills

Georgia's first graders scored close to or above the national norms for all five standardized assessments of language and communications skills. These children were also rated by their teachers as better than good, which is above average, in terms of language and communication skills at the end of first grade. Children in all categories answered more questions correctly in each test period than they had in the prior period and experienced similar growth rates. However, there were some important differences in the scores (for a complete breakdown of the three years of raw and standardized scores, please see Appendices A, B, C and D).

Comparing Language and Communication Skills: Raw Scores

Across all tests, children whose mothers had completed higher levels of education had better language and communication skills than children whose mothers had completed lower levels of education. In addition children who had lived at home with both parents since birth posted higher scores than the other children who had not lived at home with both parents since birth.

In addition, the age at which children started their preschool program affected their raw scores. Specifically on the PPVT, younger children (close to four years old at the beginning of preschool) gained 4.9 more points than older children. However, it is important to note that children closer to four ended first grade 3.1 points behind their older counterparts. Also, Hispanic and Asian children gained approximately 5 points more than their White and African-American counterparts (Table 2.1). African-American and White children gained comparable amounts through the end of first grade, but the average performance of African-American children lagged behind White children by nearly 15 points.

TABLE 2.1. RECEPTIVE LANGUAGE (PPVT) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	93.8 (16.5)	+43.3
	Including all (4 group sample – 2 yr.)	95.3 (16.8)	(+23.0)*
Entry Age	4	94.9 (16.3) ^b	+46.3
	5	98.0 (16.6) ^b	+41.4
Race	White	101.6 (15.4) ^c	+41.9
	African-American	85.1 (14.3) ^c	+41.7
	Other	95.8 (14.1) ^c	+46.5
Living with Both Parents Since Birth	Yes	99.9 (16.0) ^l	+43.6
	No	88.2 (15.0) ^l	+41.9
Mother's Education	Less than HS	82.9 (13.1) ⁿ	+46.7
	HS diploma	91.4 (15.0) ⁿ	+42.4
	Greater than HS	99.8 (16.3) ⁿ	+42.3

^b Entry Age differences are significant at 0.01 level.

^c Means for all groups differ significantly at 0.05 level.

^l Living with Both Parents Since Birth differences are significant at 0.01 level.

ⁿ Mother's Education differences are significant at 0.01 level.

* Indicates a two year change.

On average, children whose families received TANF recognized five fewer letters and/or words than children whose families did not qualify for these benefits (Table 2.2).

Mothers with more education and living with both parents since birth also positively influenced letter-word recognition skills.

TABLE 2.2. WJ- LETTER WORD END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	36.5 (7.8)	+29.2
	Including all (4 group sample – 2 yr.)	36.9 (7.9)	+21.7
TANF	Received	32.7 (8.5) ¹	+26.2
	Did not receive	38.1 (7.5) ¹	+30.3
Living with Both Parents Since Birth	Yes	38.9 (7.0) ¹	+30.6
	No	34.5 (8.6) ¹	+28.1
Mother's Education	Less than HS	31.1 (7.5) ⁿ	+26.7
	HS diploma	35.4 (7.3) ⁿ	+28.7
	Greater than HS	38.8 (7.6) ⁿ	+30.0

¹ TANF differences are significant at 0.05 level.

¹ Living with Both Parents Since Birth differences are significant at 0.01 level.

ⁿ Mother's education differences are significant at 0.01 level.

On expressive language skills (OWLS), living with both parents since birth and higher levels of mother's education were associated with higher scores. Gaps between these groups of students persisted or widened during early elementary school (Table 2.3). Although the boys started preschool more than 3 points behind the girls in terms of receptive language skills, boys ended first grade only 0.7 behind the girls.

TABLE 2.3. EXPRESSIVE LANGUAGE (OWLS) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	49.3 (9.8)	+26.0
	Including all (4 group sample – 2 yr.)	50.1 (10.0)	+9.5
Gender	Male	48.6 (10.1)	+26.0
	Female	49.3 (9.7)	+23.6
Living with Both Parents Since Birth	Yes	51.5 (9.6) ^k	+26.0
	No	46.5 (9.9) ^k	+25.1
Mother's Education	Less than HS	41.0 (7.8) ^m	+24.3
	HS diploma	48.6 (9.7) ^m	+25.6
	Greater than HS	52.7 (9.3) ^m	+26.3

^k Living with Both Parents Since Birth differences are significant at 0.05 level.

^m Mother's education differences are significant at 0.05 level.

Finally, with regard to phonemic awareness (a predictor of later success in reading), White students gained 7 points between the beginning of kindergarten and the end of first grade on the Elision sub-test (Table 2.4). This compares to a 5.2 point gain by African-American students over the same time period. The gap in performance on this test, which has been shown to predict first grade reading scores, widened for African-American children by the end of first grade.

TABLE 2.4. PHONEMIC AWARENESS (CTOPP- ELISION) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool	8.9 (4.5)	+6.2
	Including all	10.6 (2.9)	+7.6
Race	White	10.7 (4.9) ^e	+7.0
	African-American	7.3 (3.5) ^e	+5.2
	Other	9.4 (4.4) ^e	+6.2
Living with Both Parents Since Birth	Yes	51.5 (9.6) ^k	+26.0
	No	46.5 (9.9) ^k	+25.1
Mother's Education	Less than HS	6.8 (3.6) ⁿ	+5.7
	HS diploma	8.5 (4.4) ⁿ	+6.0
	Greater than HS	10.3 (4.7) ⁿ	+6.6

^e Means for all groups differ significantly at 0.05 level.

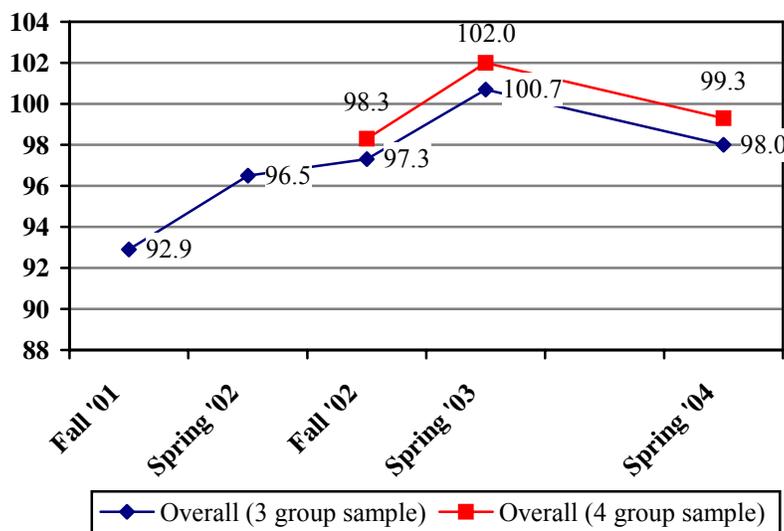
^k Living with Both Parents Since Birth differences are significant at 0.05 level.

ⁿ Mother's education differences are significant at 0.01 level.

Comparing Language and Communication Skills: National Norms

In terms of receptive language skills (PPVT), Georgia's early elementary students posted substantial increases relative to national norms (Figure 2.1). The students began preschool with a mean score of 92.9, well below the national norm (100). Through preschool and kindergarten, the students made gains against the national average. By the end of kindergarten, they matched the national average with a mean score of 100.7. However, by the end of first grade, on average, the students lost ground against the national mean and ended first grade with a mean score of 98.0. When the non-preschool sample was included in kindergarten, the students exceeded the national average with a score of 102.0. However the children ended the first grade slightly below the norm with an average of 99.3. Losing ground against the national norms at the end of first grade may result from Georgia's first graders not acquiring the higher-order skills by the age of seven that their peers across the nation have acquired by that age.

FIGURE 2.1. PPVT STANDARDIZED SCORE



When analyzed by socio-demographic characteristics, there are significant differences by race and receipt of TANF (Figures 2.2 and 2.3). White students consistently scored higher on the PPVT. However, Other Minority students were able to close the gap to 4 points by the end of kindergarten, only to have it widen to 5.4 points by the end of first grade. The difference between African-American students and White students remained consistently sizeable throughout the three-year period. At the beginning of preschool, African-American students trailed White students by 14.3 points. By the end of first grade, that difference had slightly narrowed to 13.6. In a similar fashion, children from families receiving TANF scored consistently lower than children from more economically advantaged families. At the beginning of preschool, there was an 11.7 point difference. That difference persisted through the end of first grade with a final gap of more than 12 points.

FIGURE 2.2. PPVT by Race

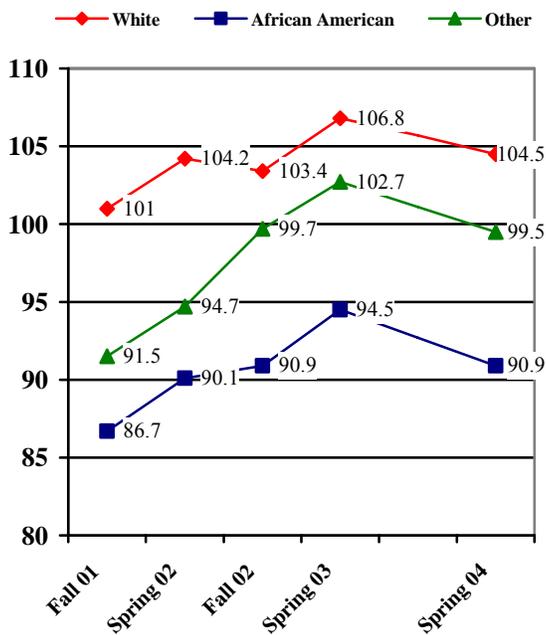
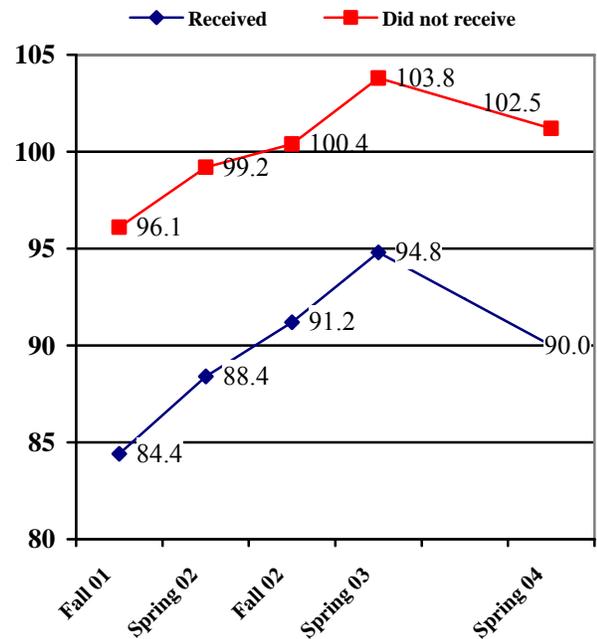
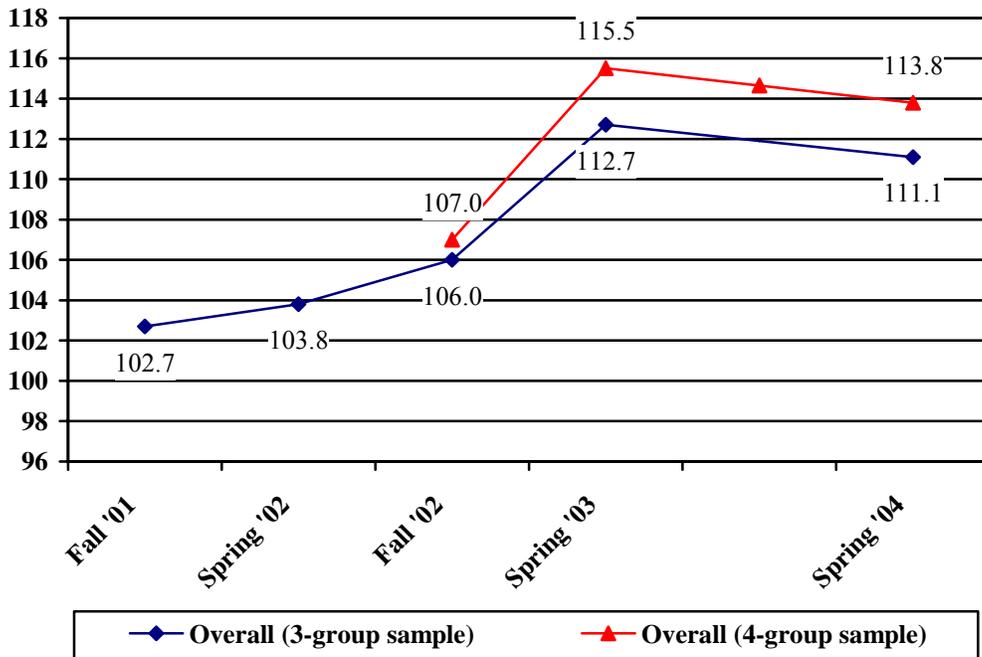


FIGURE 2.3. PPVT by TANF Receipt



Concerning their ability to identify letters and words (WJ- Letter Word), students in all three years of the study began preschool above the national average (102.7) and remained above these norms through the first grade (Figure 2.4). At the end of first grade, the average scores dropped from the high posted at the end of kindergarten but remained well above the national norm.

FIGURE 2.4. WJ- LETTER WORD STANDARDIZED SCORE



When analyzed by socio-demographic characteristics, African-American students lost ground against White students (Figure 2.5). All students began preschool with no significant differences between them. However, by the end of first grade, African-American students were significantly behind both White students and Other Minority students. Moreover, the differences between children from households that received TANF and those that did not maintained a consistently significant gap that averaged approximately 6 points throughout their early elementary years (Figure 2.6).

FIGURE 2.5. WJ- LW by Race

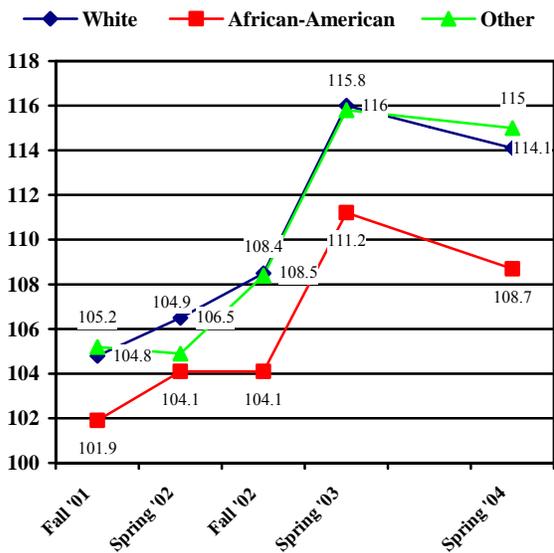
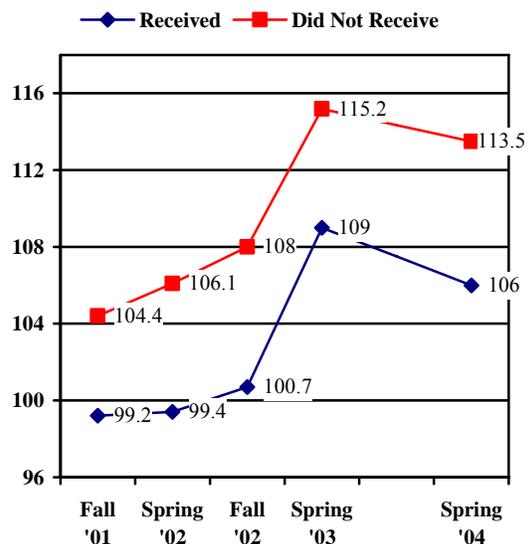
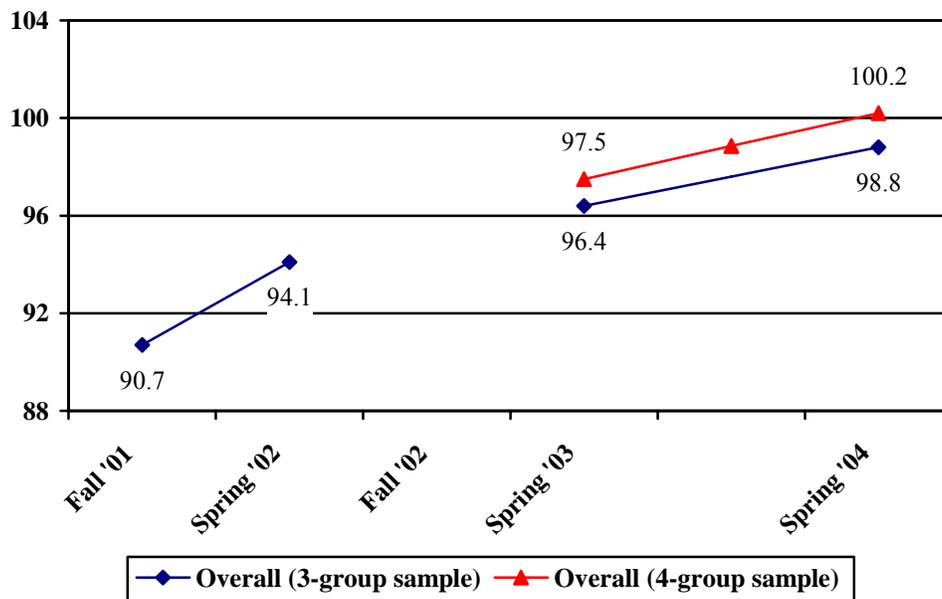


FIGURE 2.6. WJ-LW by TANF Receipt



In terms of expressive language (OWLS), students in all three years of the study began preschool behind the national norm (Figure 2.7). However, each year they were able to gain on the national norms and by the end of first grade had come close to matching it. When the sample of students who did not attend a formal preschool is included, Georgia's first graders, on average, attained the national norm (100.2). In contrast to the previously presented language skill assessments, Georgia's children continued to progress against the national norms in expressive language.

FIGURE 2.7. OWLS STANDARDIZED SCORE



As with the other language and communication tests, there were significant differences among socio-demographic sub-groups on expressive language (OWLS) (Figures 2.8 and 2.9). While the race gaps remained relatively consistent across time, Other Minority children, including Asian-American and Hispanic students, lost ground against the norm between the end of kindergarten and the end of first grade. White children and African-American children maintained their previous averages at the end of first grade and a gap of over 10 points persisted. The significant differences between children who lived in homes receiving TANF and those that did not also remained relatively consistent across time, averaging a difference of between 9 and 10 points.

FIGURE 2.8. OWLS by Race

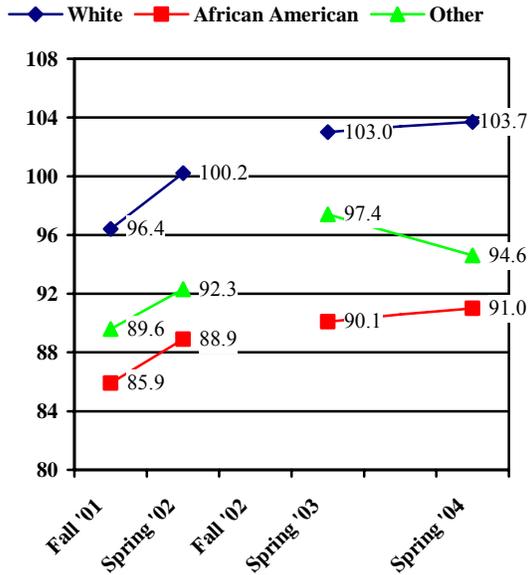
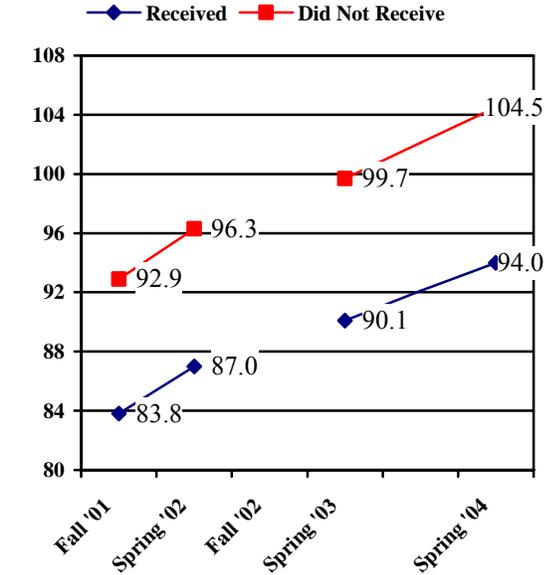


FIGURE 2.9. OWLS by TANF Receipt



Communication Readiness Score

Children’s communication skills were assessed at the beginning and end of each year of the study by the children’s classroom teacher. The scale ranged from 1 “extraordinarily poor” to 7 “extraordinarily good.” In every subgroup, teachers consistently rated the children’s communication skills higher at the end of the school year than the beginning. Teachers also rated the children’s communication skills lower at the beginning of kindergarten and first grade than the previous year’s teacher had rated them at the end of the previous school year (Table 2.5).

When examining communication skills ratings by characteristics of the child or their family, patterns similar to those reported for the assessments emerge. Receipt of TANF, having both parents in the home with the child continuously, and the mother’s education level all influenced the child’s communication skills ratings as observed by their teachers. Female students were consistently rated as having higher communication skills than the male students, but the gap diminished slightly in early elementary school.

TABLE 2.5. COMMUNICATION SKILLS RATINGS BY CHILD AND FAMILY CHARACTERISTICS

Characteristic		Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall	3 group sample	4.7 (1.1)	5.0 (1.1)	4.9(1.3)	5.4 (1.2)	4.8 (1.2)	5.2 (1.2)
	4 group sample	N/A	N/A	4.9 (1.3)	5.5 (1.2)	4.9 (1.2)	5.5 (1.2)
Gender	Male	4.4(1.0)	4.8 (1.1)	4.8 (1.3)	5.3 (1.2)	4.8 (1.2)	5.1 (1.2)
	Female	5.0 (1.0)	5.4 (1.1)	5.1 (1.3)	5.8 (1.2)	5.2 (1.2)	5.5 (1.1)
Race	White	4.7 (1.1)	5.1 (1.2)	5.0 (1.3)	5.4 (1.2)	5.0 (1.1)	5.4 (1.1)
	African-American	4.7 (1.0)	4.9 (1.0)	4.6 (1.2)	5.3 (1.3)	4.5 (1.2)	4.9 (1.3)
	Other	4.7 (1.1)	5.1 (1.2)	5.1 (1.2)	5.5 (1.0)	5.1 (1.4)	5.2 (1.1)
Working Poor	Yes	4.6 (1.1)	4.9 (1.1)	4.6 (1.3)	5.1 (1.3)	4.5 (1.2)	5.0 (1.2)
TANF	No	4.9 (1.1)	5.2 (1.2)	5.4 (1.2)	5.9 (1.1)	5.4 (1.0)	5.6 (1.0)
Income	Received	4.7 (1.0)	5.0 (1.1)	4.5 (1.3)	5.1 (1.3)	4.4 (1.2)	4.8 (1.2)
	Did not Receive	4.7 (1.1)	5.1 (1.1)	5.2 (1.2)	5.7 (1.2)	5.2 (1.1)	5.6 (1.1)
	\$0-39,999	4.6 (1.1)	5.0 (1.1)	4.6 (1.3)	5.1 (1.3)	4.4 (1.2)	4.9 (1.2)
	\$40,000-79,999	4.8 (1.1)	5.2 (1.2)	5.2 (1.2)	5.6 (1.2)	5.2 (1.1)	5.6 (1.1)
Living with Both Parents Since Birth	\$80,000+	4.7 (0.9)	5.3 (1.2)	5.4 (1.3)	6.0 (1.2)	6.1 (1.1)	5.3 (1.2)
	Yes	4.8 (1.1)	5.2 (1.1)	5.2 (1.3)	5.7 (1.1)	5.2 (1.1)	5.5 (1.1)
Mother's Education	No	4.6 (1.1)	4.8 (1.2)	4.7 (1.2)	5.3 (1.3)	4.5 (1.2)	4.9 (1.2)
	Less than HS	4.4 (1.0)	4.8 (1.0)	4.1 (1.3)	5.0 (1.4)	4.1 (1.0)	4.4 (1.1)
	HS diploma	4.7 (1.0)	5.0 (1.2)	4.8 (1.2)	5.3 (1.2)	4.6 (1.3)	5.1 (1.2)
	Greater than HS	4.9 (1.1)	5.2 (1.1)	5.2 (1.3)	5.7 (1.2)	5.3 (1.1)	5.6 (1.1)

Cognitive and General Knowledge

Georgia's first graders scored above the national norms on all three standardized assessments for cognitive skills at the end of first grade. These children were also rated by their teachers as better than average in terms of their academic skills at the end of first grade. Children in all categories were able to answer more questions correctly in each test period than they had in the prior period and experienced similar growth rates. However, there were some important differences in the scores (For a complete breakdown of the three years of raw and standardized scores, please see Appendix C and D).

Comparing Cognitive Skills and General Knowledge: Raw Scores

There are fewer differences in the sub-group categories among cognitive and general knowledge raw score skills tests that there were in the language and communications skills tests. However, like the language and communication skills, mother's education and the presence of both parents in the home were consistently significant across all directly assessed cognitive skills and general knowledge. Moreover, while all students gained at similar rates, economically disadvantaged children began preschool and ended first grade significantly behind their more advantaged counterparts.

Specifically for problem-solving skills (WJ-Applied Problems), the greatest difference can be found between races. The overall gain on the Applied Problems across all children was 15.4 points (Table 2.6). However, Other Minority students, including

Hispanics and Asian-Americans, gained an average of 16.8 points compared to White students who

TABLE 2.6. WJ- APPLIED PROBLEMS END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	26.1 (3.9)	+15.4
	Including all (4 group sample – 2 yr.)	26.4 (3.9)	+9.4*
Race	White	27.7 (3.5)	+15.1
	African-American	24.2 (3.7) ^g	+15.2
	Other	27.1 (3.3)	+16.8
Working Poor	Yes	25.0 (4.0) ^o	+15.3
	No	27.7 (3.5) ^o	+15.2
TANF	Received	24.1 (4.4) ^j	+15.6
	Did not receive	26.9 (3.7) ^j	+15.5
Living with Both Parents Since Birth	Yes	27.3 (3.7) ^k	+15.5
	No	25.3 (3.9) ^k	+15.5
Mother’s Education	Less than HS	23.4 (4.1) ^m	+15.2
	HS diploma	26.1 (3.8) ^m	+15.6
	Greater than HS	26.9 (3.7) ^m	+14.7

^g African-Americans differ significantly from Whites and Others at 0.05 level.

^j TANF differences are significant at 0.01 level.

^k Living with Both Parents Since Birth differences are significant at 0.05 level.

^m Mother’s Education differences are significant at 0.05 level.

^o Means Tested differences are significant at 0.01 level.

gained 15.1 and African-American students who gained 15.2 points. It should be noted that White students started their preschool year 2 points ahead. The Other Minority students were able to close the gap by the end of first grade. Students that were categorized as “working poor” (qualified for means tested benefits) began preschool 3.1 points behind those who did not. By the end of first grade, that gap had narrowed slightly to 2.7. In addition, children who received TANF remained an average of 2.9 points behind those who did not receive TANF throughout the early elementary years.

The arithmetic test (WJ-Calculation), while only administered at the end of kindergarten and first grade, showed patterns similar to problem-solving skills with regard to income (Table 2.7). Students from working poor families and those eligible for TANF ended their first grade year significantly behind their counterparts. However, both sets of students gained at approximately the same rate during their first grade year.

Finally, the mathematical concepts (WJ-Math Fluency) test showed similar patterns with regard to students that were eligible for means tested benefits (Table 2.8). While both sets of students gained at approximately the same rate (21.3 v. 21.4), students from working poor families tested significantly lower on the Math Fluency sub-test than those who were not eligible. The gap in math skills between children of better educated mothers and those of less educated mothers appeared to be growing at the end of first grade.

TABLE 2.7. WJ- CALCULATION END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	9.7 (2.8)	+5.1
	Including all (4 group sample – 2 yr.)	9.8 (2.7)	+5.0
Working Poor	Yes	9.0 (2.7) ^o	+5.1
	No	10.5 (2.8) ^o	+4.9
TANF	Received	8.2 (3.0) ^j	+4.7
	Did not receive	10.0 (2.7) ^j	+4.9
Living with Both Parents Since Birth	Yes	10.2 (2.7) ^k	+4.9
	No	9.2 (2.8) ^k	+5.1
Mother's Education	Less than HS	8.0 (3.4) ⁿ	+4.5
	HS diploma	9.6 (2.3) ⁿ	+4.9
	Greater than HS	10.2 (3.1) ⁿ	+5.1

^j TANF differences are significant at 0.01 level.

^k Living with Both Parents Since Birth differences are significant at 0.05 level.

ⁿ Mother's Education differences are significant at 0.01 level.

^o Means Tested differences are significant at 0.01 level.

TABLE 2.8. WJ- MATH FLUENCY END OF FIRST GRADE DEVELOPMENT – RAW SCORE

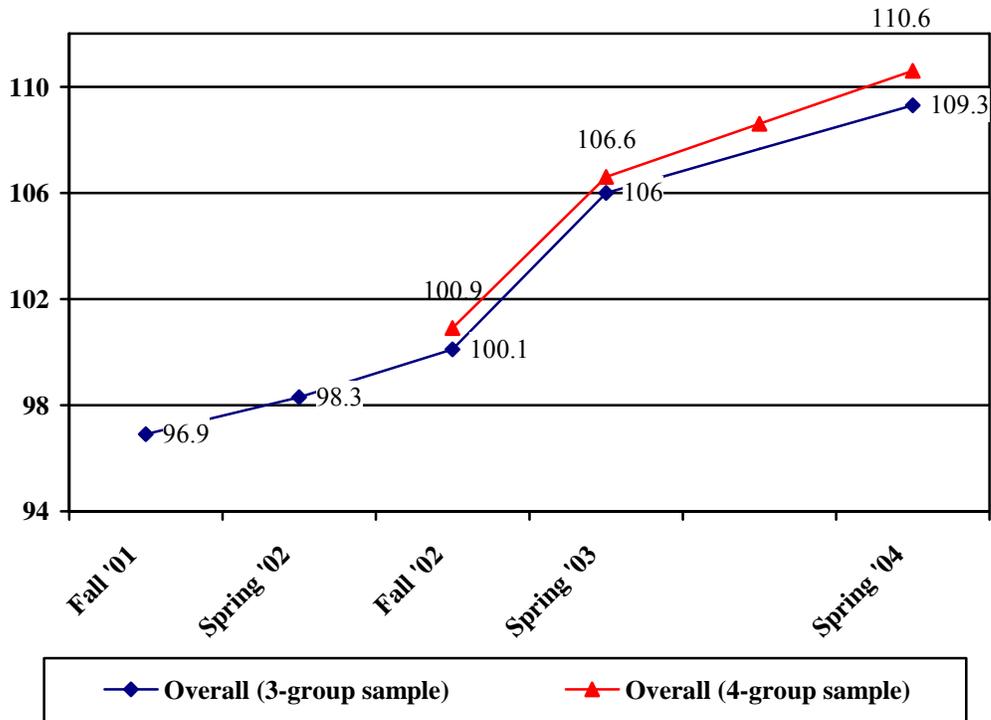
	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	31.4 (12.2)	+21.4
	Including all (4 group sample – 2 yr.)	31.7 (12.1)	+21.3
Working Poor	Yes	29.3 (12.8) ^o	+21.3
	No	34.1 (11.3) ^o	+21.4
Living with Both Parents Since Birth	Yes	33.4 (11.3)	+21.6
	No	28.8 (12.7)	+20.4
Mother's Education	Less than HS	25.2 (13.1)	+19.0
	HS diploma	31.6 (12.5)	+21.8
	Greater than HS	32.9 (11.2)	+21.3

^o Means tested differences are significant at 0.01 level.

Gains Relative to National Norms

Georgia students posted significant gains against the national norms for children of their age on their problem-solving skills throughout the study period (Figure 2.10). Preschool students began that school year (96.9) slightly behind the national norm (100). However, they had met the norm by the beginning of kindergarten and well exceeded it by the end of first grade (109.3). The pattern is similar for the entire sample, including students who did not attend a formal preschool.

FIGURE 2.10. WJ- APPLIED PROBLEMS STANDARDIZED SCORE



Like the language and communication skills, differences in the children's problem-solving skills are related to characteristics of their families (Figure 2.12). Problem-solving (WJ-Applied Problems) was the only assessment in this group that was administered to the children prior to beginning preschool. White students began preschool scoring higher than Other Minority students and above the national norm (Figure 2.11). Other Minority students, including Hispanic and Asian-American students, were able to close the gap and end their first grade year on par with White students. African-American students scored above the national norms for problem-solving by the end of first grade. However, African-American students continued to have a significant gap between themselves and students of other races.

FIGURE 2.11. WJ - Applied Problems by Race

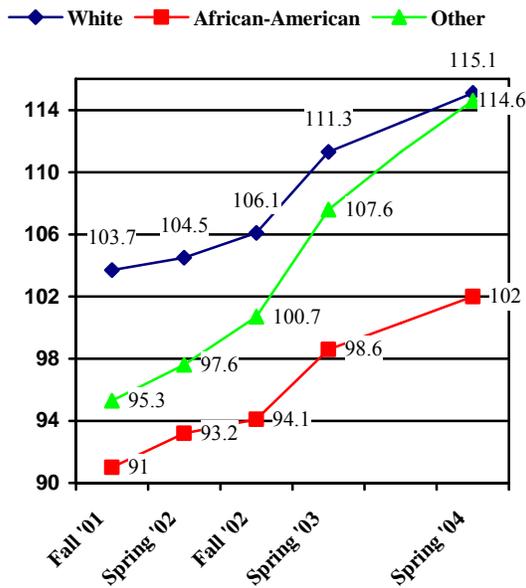
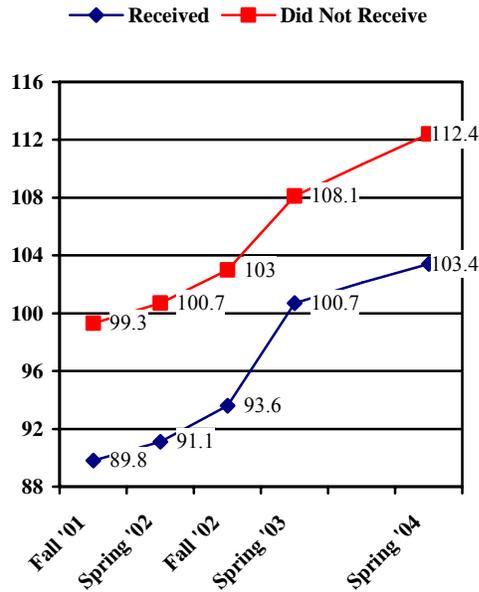


FIGURE 2.12. WJ - Applied Problems by TANF Receipt



Academic Skills Ratings

The academic skills ratings consisted of an overall assessment of the academic skills by the classroom teachers. Each child was scored on a scale ranging from 1 “extraordinarily poor” to 7 “extraordinarily good.” In general, students ended first grade rated as good, well above the average rating (Table 2.9). However, there was more than a one point drop in academic skills ratings between the end of kindergarten and the beginning of first grade. Apparently, the skills and knowledge that teachers rate as good at the end of their year with the children are rated average by teachers in the next grade, which could be attributable to summer learning loss or differences in expectations.

The differences found within the subgroups became more pronounced after the preschool year. Once again, when looking at gender, teachers rated female students’ academic skills consistently higher than those of the male students. Also, when examining the difference between race, African-American students scored lower than the other race groups. Except for the fall of 2001, the preschool year, Other Minority students scored at least equal to or higher than the White students.

Children who had lived in the household with both parents continuously since birth scored higher than the children who had not. Children whose mothers did not have a high school education scored lower on academic skills than the children whose mothers had at least a high school diploma or higher.

TABLE 2.9. ACADEMIC SKILLS RATINGS BY CHILD AND FAMILY CHARACTERISTICS

Characteristic		Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall	3 group sample	4.4 (1.1)	4.7 (1.2)	4.8 (1.4)	5.8 (1.1)	4.5 (1.4)	5.2 (1.3)
	4 group sample	N/A	N/A	4.8 (1.5)	5.8 (1.1)	4.6 (1.4)	5.2 (1.3)
Gender	Male	4.2 (1.1)	4.5 (1.2)	4.6 (1.4)	5.7 (1.1)	4.4 (1.3)	5.1 (1.3)
	Female	4.7 (1.0)	5.1 (1.2)	5.1 (1.4)	6.0 (1.0)	4.8 (1.4)	5.4 (1.2)
Race	White	4.6 (1.1)	4.8 (1.2)	4.9 (1.4)	5.8 (1.1)	4.6 (1.4)	5.3 (1.2)
	African-American	4.3 (1.0)	4.5 (1.2)	4.7 (1.3)	5.7 (1.0)	4.2 (1.4)	4.9 (1.3)
	Other	4.3 (1.1)	5.0 (1.3)	5.2 (1.2)	5.8 (1.2)	4.8 (1.5)	5.3 (1.2)
Working Poor	Yes	4.3 (1.1)	4.7 (1.2)	4.5 (1.4)	5.5 (1.1)	4.1 (1.5)	5.0 (1.3)
	No	4.6 (1.1)	5.0 (1.3)	5.3 (1.2)	6.1 (0.9)	5.0 (1.2)	5.7 (1.0)
TANF	Received	4.3 (1.1)	4.6 (1.2)	4.3 (1.4)	5.5 (1.1)	4.1 (1.5)	4.8 (1.4)
	Did not receive	4.6 (1.1)	4.9 (1.2)	5.2 (1.3)	6.0 (1.0)	4.9 (1.2)	5.5 (1.1)
Income	\$0-39,999	4.3 (1.1)	4.7 (1.2)	4.5 (1.5)	5.4 (1.2)	4.1 (1.5)	4.8 (1.4)
	\$40,000-79,999	4.6 (1.1)	4.9 (1.3)	5.1 (1.3)	6.0 (1.0)	4.8 (1.3)	5.5 (1.0)
	\$80,000+	4.6 (1.2)	5.1 (1.6)	5.6 (1.1)	6.4 (0.8)	5.8 (0.8)	5.5 (1.3)
Living with Both Parents Since Birth	Yes	4.5 (1.1)	4.9 (1.2)	5.1 (1.4)	6.0 (0.9)	4.8 (1.3)	5.5 (1.1)
	No	4.4 (1.2)	4.6 (1.2)	4.5 (1.5)	5.5 (1.1)	4.2 (1.4)	4.9 (1.3)
Mother's Education	Less than HS	3.9 (1.0)	4.3 (1.1)	3.9 (1.3)	5.1 (1.4)	3.2 (1.3)	4.1 (1.4)
	HS diploma	4.4 (1.0)	4.7 (1.2)	4.8 (1.3)	5.7 (1.0)	4.4 (1.3)	5.1 (1.2)
	Greater than HS	4.6 (1.2)	5.0 (1.2)	5.1 (1.4)	6.0 (1.0)	4.9 (1.3)	5.6 (1.1)

Social Behaviors and Task Persistence

Teachers also rated the children's social skills at the beginning and end of each school year on the same 1 to 7 scale (Table 2.10), including social behaviors and task persistence. In terms of social behaviors, there was a one point drop between the beginning and end of first grade. Since the first time task persistence ratings were collected at the end of kindergarten, the ratings fell, ending slightly below average at the end of first grade.

The trend in children's social behaviors is evident in every subgroup, lower at the end of first grade than at the beginning of first grade. This could be attributed to a number of different reasons. Teachers and children tend to become anxious and excited as the end of the school year nears in anticipation of summer vacation, which could account for the falling scores. Alternatively, first grade teachers have higher expectations for the social behaviors exhibited by children in their classes at the end of the year, especially when compared to expectations of preschool and kindergarten teachers.

Once again, similar differences to other skill categories persist in the social behavior of boys and girls, children in families receiving TANF, those living with both parents, and those whose mothers have more education. However, it is interesting to note that for the race subgroup, the Other Minorities, primarily Hispanic and Asian-Americans, scored higher than Whites and African-Americans, although the difference is slight.

TABLE 2.10. BEHAVIORAL RATINGS BY CHILD AND FAMILY CHARACTERISTICS

Characteristic		Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall	3 group sample	4.8 (1.1)	5.0 (1.2)	4.9 (1.2)	5.3 (1.3)	5.0 (1.4)	4.0 (0.8)
	4 group sample	N/A	N/A	5.1 (1.2)	5.4 (1.4)	5.1 (1.4)	4.1 (0.8)
Gender	Male	4.6 (1.2)	4.7 (1.2)	4.8 (1.2)	5.0 (1.3)	4.8 (1.4)	4.0 (0.9)
	Female	5.2 (1.1)	5.4 (1.1)	5.3 (1.2)	5.9 (1.1)	5.4 (1.3)	4.3 (0.8)
Race	White	4.8 (1.2)	5.0 (1.2)	4.9 (1.3)	5.2 (1.3)	5.0 (1.4)	4.1 (0.8)
	African-American	4.8 (1.1)	4.9 (1.1)	4.9 (1.2)	5.3 (1.3)	4.8 (1.2)	3.9 (0.9)
	Other	4.9 (1.2)	5.3 (1.2)	5.2 (1.1)	5.4 (1.2)	5.2 (1.7)	4.3 (0.8)
Working Poor	Yes	4.7 (1.2)	4.9 (1.2)	4.8 (1.2)	5.0 (1.2)	4.6 (1.4)	3.9 (0.9)
	No	5.0 (1.1)	5.3 (1.1)	5.4 (1.3)	5.7 (1.2)	5.5 (1.2)	4.3 (0.8)
TANF	Received	4.8 (1.1)	4.9 (1.2)	4.8 (1.2)	5.1 (1.3)	4.7 (1.4)	3.9 (0.9)
	Did not receive	4.9 (1.2)	5.1 (1.2)	5.2 (1.3)	5.6 (1.2)	5.2 (1.4)	4.1 (0.8)
Income	\$0-39,999	4.7 (1.1)	5.0 (1.2)	4.7 (1.2)	5.0 (1.2)	4.6 (1.4)	4.0 (0.8)
	\$40,000-79,999	5.0 (1.2)	5.1 (1.2)	5.2 (1.3)	5.5 (1.3)	5.2 (1.4)	4.1 (0.9)
	\$80,000+	4.9 (1.2)	5.6 (1.0)	5.1 (1.6)	6.0 (1.2)	5.6 (1.1)	4.1 (0.6)
Living with Both Parents Since Birth	Yes	5.0 (1.1)	5.2 (1.1)	5.3 (1.2)	5.6 (1.2)	5.4 (1.3)	4.2 (0.8)
	No	4.6 (1.2)	4.8 (1.2)	4.7 (1.3)	5.1 (1.3)	4.5 (1.4)	3.9 (0.9)
Mother's Education	Less than HS	4.7 (1.0)	4.8 (0.9)	4.5 (1.3)	5.1 (1.6)	4.6 (1.3)	3.8 (0.9)
	HS diploma	4.7 (1.2)	4.9 (1.3)	4.8 (1.2)	5.1 (1.3)	4.8 (1.5)	4.0 (0.9)
	Greater than HS	5.0 (1.2)	5.1 (1.1)	5.2 (1.2)	5.5 (1.3)	5.3 (1.3)	4.2 (0.8)

Task persistence, a skill that is developed during early education, is widely considered important for children's success in school. Few differences in task persistence existed among these groups by the end of first grade (Table 2.11). However, the task persistence of Georgia's early elementary students in the study declined from an average rating above good to slightly below average by the end of first grade. The reasons for this decline are not clear but may be attributed to either rising expectations of teachers or an actual decline in persistence.

TABLE 2.11. TASK PERSISTENCE RATINGS BY CHILD AND FAMILY CHARACTERISTICS

Characteristics		Spring 2003 Mean (sd)	Fall 2003 Mean (sd)	Spring 2004 Mean (sd)
Overall	3 group sample	5.13 (1.58)	4.67 (1.68)	3.68 (1.04)
	4 group sample	5.46 (1.38)	5.18 (1.55)	3.86 (0.96)
Gender	Male	5.22 (1.49)	4.76 (1.75)	3.78 (0.98)
	Female	5.24 (1.52)	4.90 (1.62)	3.74 (1.05)
Race	White	5.23 (1.42)	4.98 (1.56)	3.83 (0.94)
	African-American	5.23 (1.57)	4.69 (1.74)	3.72 (1.06)
	Other	5.12 (1.70)	4.66 (1.90)	3.65 (0.99)
Working Poor	Yes	4.88 (1.65)	4.40 (1.56)	3.55 (1.03)
	No	5.56 (1.39)	5.25 (1.54)	4.00 (0.98)
TANF	Received	5.35 (1.36)	5.22 (1.57)	4.14 (0.72)
	Did not receive	5.25 (1.50)	4.38 (1.68)	3.77 (0.99)
Income	\$0-39,999	4.98 (1.66)	4.37 (1.58)	3.59 (1.04)
	\$40,000-79,999	5.28 (1.54)	4.92 (1.78)	3.80 (1.05)
	\$80,000+	6.11 (1.05)	5.40 (1.52)	3.90 (0.91)
Living with Both Parents Since Birth	Yes	5.21 (1.48)	4.93 (1.64)	3.87 (0.99)
	No	5.34 (1.49)	4.86 (1.72)	3.63 (0.99)
Mother's Education	Less than HS	5.20 (1.54)	4.88 (1.68)	3.79 (1.00)
	HS diploma	5.30 (1.44)	4.69 (1.80)	3.75 (1.00)
	Greater than HS	5.19 (1.53)	4.87 (1.61)	3.76 (1.02)

Health and Well-Being

The health and well-being rating was determined by the teacher's assessment of specific criteria for each child, including overall health, general appearance, and being well rested. These criteria were measured on the 1 "extraordinarily poor" to 7 "extraordinarily good" scale. Overall, the students scored consistently well, ranging from 5.5 to 5.8 across time (Table 2.12). These ratings, which are near the top of the scale and the highest of any category, seem to indicate that very few children experienced difficulties that affected their health during early elementary grades.

Once again, female students received higher teacher ratings on scales of health and well-being than the male students. However, there was only a slight difference found in teacher ratings of health and well-being between races. Although the difference was small, Hispanic and Asian (Other Minorities) students were rated highest on health and well-being and African-Americans were rated lowest. The exception was spring of 2003, when African-Americans were rated higher than Whites and Other Minorities in terms of their health and well-being.

The family characteristics follow the same trends as other teacher ratings. Children whose families did not receive TANF, children whose mothers had a high school diploma or higher, and children who had lived in the home continuously with both parents scored higher than their counterparts on ratings of health and well-being.

TABLE 2.12. HEALTH AND WELLNESS RATINGS BY CHILD AND FAMILY CHARACTERISTICS

Characteristic		Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall	3 group sample	5.5 (1.0)	5.6 (1.0)	5.7 (1.1)	5.8 (1.1)	5.6 (1.1)	5.7 (1.1)
	4 group sample	N/A	N/A	5.7 (1.1)	5.8 (1.1)	5.7 (1.1)	5.8 (1.1)
Gender	Male	5.4 (1.0)	5.4 (1.1)	5.6 (1.1)	5.7 (1.0)	5.5 (1.1)	5.6 (1.1)
	Female	5.6 (0.9)	5.8 (1.0)	5.8 (1.0)	6.0 (1.0)	5.8 (1.0)	6.0 (1.0)
Race	White	5.5 (1.0)	5.6 (1.1)	5.6 (1.1)	5.7 (1.1)	5.6 (1.2)	5.8 (1.2)
	African-American	5.4 (1.0)	5.5 (1.0)	5.7 (1.1)	5.9 (1.0)	5.6 (1.0)	5.6 (1.2)
	Other	5.6 (0.9)	5.7 (1.1)	5.8 (0.9)	5.7 (1.1)	5.8 (0.9)	5.8 (1.0)
Working Poor	Yes	5.4 (1.0)	5.5 (1.1)	5.4 (1.1)	5.5 (1.2)	5.3 (1.1)	5.6 (1.1)
	No	5.6 (1.0)	5.8 (1.0)	6.0 (0.9)	6.1 (0.9)	6.0 (1.0)	6.1 (0.9)
TANF	Received	5.4 (1.0)	5.5 (1.0)	5.4 (1.1)	5.5 (1.1)	5.3 (1.1)	5.5 (1.2)
	Did not receive	5.6 (1.0)	5.7 (1.1)	5.9 (1.0)	6.0 (1.0)	5.8 (1.0)	6.0 (1.0)
Income	\$0-39,999	5.3 (1.0)	5.5 (1.1)	5.5 (1.1)	5.4 (1.3)	5.3 (1.1)	5.6 (1.1)
	\$40,000-79,999	5.6 (1.0)	5.7 (1.1)	5.9 (0.9)	6.1 (0.9)	5.9 (1.0)	6.0 (1.0)
	\$80,000+	5.6 (1.0)	6.1 (0.8)	6.0 (1.1)	6.2 (1.0)	6.2 (0.9)	6.1 (0.7)
Living with Both Parents Since Birth	Yes	5.6 (1.0)	5.7 (1.1)	5.9 (1.0)	6.0 (1.0)	5.8 (1.0)	6.0 (0.9)
	No	5.3 (1.0)	5.4 (1.1)	5.5 (1.1)	5.7 (1.1)	5.3 (1.1)	5.5 (1.1)
Mother's Education	Less than HS	5.2 (0.9)	5.4 (1.1)	5.1 (1.0)	5.3 (1.2)	5.0 (1.1)	5.1 (1.3)
	HS diploma	5.4 (1.0)	5.5 (1.1)	5.6 (1.0)	5.7 (1.1)	5.4 (1.2)	5.6 (1.1)
	Greater than HS	5.6 (0.9)	5.7 (1.0)	5.9 (1.0)	6.1 (0.9)	5.9 (0.9)	6.0 (0.9)

Overall School Readiness

Preparing children for school success is an important goal of the Georgia Pre-K program and most preschools. Overall readiness for school was measured through teachers' ratings of the child's preparedness at the end of preschool, the beginning and end of kindergarten, and the beginning of first grade. This rating was important because it may have included skills that teachers deemed important but were not specifically assessed by other measures.

On average, the readiness ratings of beginning first graders are rated slightly above good. Overall, the gains that occurred between the fall and spring of the child's kindergarten year faded at the beginning of first grade. This could be due to increased expectations or learning loss that occurred during the summer break between kindergarten and first grade (Table 2.13).

At each point, teachers rated the female students as more ready than the male students. Readiness differences between racial and ethnic minorities apparently faded by the end of kindergarten but reappeared in first grade teachers' ratings of children's readiness for that grade. African-Americans were rated as less prepared for first grade than White children and children of Other Minority groups.

Family characteristics are associated with differences in the readiness of children for early elementary school. Children with mothers who had a high school diploma and those with education beyond high school were rated much higher than the children with mothers who did not have a high school education. Having both parents in the home

TABLE 2.13. READINESS SCORES BY CHILD AND FAMILY CHARACTERISTICS

Characteristics		Spring 2002	Fall 2002	Spring 2003	Fall 2003
Overall	3 group sample	5.3 (1.3)	5.2 (1.5)	5.6 (1.5)	5.1 (1.6)
	4 group sample	N/A	5.2 (1.6)	5.7 (1.4)	5.2 (1.6)
Gender	Male	5.0 (1.3)	5.1 (1.5)	5.5 (1.4)	4.9 (1.5)
	Female	5.7 (1.2)	5.6 (1.5)	6.0 (1.3)	5.5 (1.5)
Race	White	5.4 (1.3)	5.3 (1.5)	5.6 (1.5)	5.2 (1.5)
	African-American	5.1 (1.2)	5.1 (1.6)	5.6 (1.5)	4.8 (1.7)
	Other	5.6 (1.3)	5.5 (1.1)	5.6 (1.4)	5.4 (1.6)
Working Poor	Yes	5.2 (1.3)	4.9 (1.6)	5.3 (1.6)	4.7 (1.8)
	No	5.6 (1.3)	5.8 (1.2)	6.0 (1.1)	5.7 (1.3)
TANF	Received	5.2 (1.3)	4.7 (1.6)	5.3 (1.5)	4.6 (1.7)
	Did not receive	5.5 (1.3)	5.6 (1.3)	5.9 (1.3)	5.5 (1.4)
Income	\$0-39,999	5.2 (1.3)	4.9 (1.6)	5.3 (1.6)	4.6 (1.8)
	\$40,000-79,999	5.5 (1.3)	5.6 (1.3)	5.9 (1.2)	5.4 (1.4)
	\$80,000+	6.0 (1.3)	5.9 (1.0)	6.3 (1.3)	6.6 (0.9)
Living with Both Parents Since Birth	Yes	5.5 (1.3)	5.5 (1.4)	5.9 (1.2)	5.5 (1.4)
	No	5.1 (1.3)	4.9 (1.6)	5.3 (1.5)	4.7 (1.8)
Mother's Education	Less than HS	5.0 (1.3)	4.2 (1.6)	4.7 (1.8)	3.8 (1.5)
	HS diploma	5.3 (1.3)	5.2 (1.3)	5.6 (1.4)	4.8 (1.6)
	Greater than HS	5.5 (1.3)	5.6 (1.3)	5.8 (1.4)	5.5 (1.5)

continuously since birth was associated with higher readiness ratings. Receiving TANF or other means tested benefits (working poor) was associated with lower readiness ratings.

Children's Attitudes Toward School and Learning

Children's attitudes toward school and learning are important outcomes of early education and potentially related to children's later success in school. Children in the study were asked to express their own opinion on different aspects of their educational experience on a scale of 1 "Doesn't Like at All" to 4 "Really Likes." Each point on the scale was represented with words and by a face that was not happy for 1 to very happy for 4. Teachers were asked to assess each child's attitudes on the same scale.

Overall, children indicated that they liked school, and their teachers agreed (Table 2.14). Teachers felt that the children who did not participate in fulltime preschool liked school better than the others. However, the children did not express a similar difference. Children whose families received means tested benefits were thought by their teachers to be more positive toward school and learning than other children. However, the children did not reflect this difference in their attitudes.

TABLE 2.14. CHILDREN’S ATTITUDES TOWARD SCHOOL AND LEARNING BY CHILD AND FAMILY CHARACTERISTICS

Characteristics		Child CATS Mean (SD)	Teacher CATS Mean (SD)
Overall	3 group sample	2.76 (0.82)	2.54 (0.70)*
	4 group sample	2.70 (0.76)	2.72 (0.70)*
Gender	Male	2.65 (0.77)	2.68 (0.72)
	Female	2.83 (0.84)	2.56 (0.63)
Race	White	2.76 (0.81)	2.62 (0.67)
	African-American	2.72 (0.83)	2.64 (0.69)
	Other	2.68(0.73)	2.66 (0.61)
Working Poor	Yes	2.66 (0.78)	2.79 (0.65)**
	No	2.74 (0.81)	2.52 (0.70)**
TANF	Received	2.69 (0.83)	2.63 (0.85)
	Did not receive	2.72 (0.82)	2.62 (0.68)
Income	\$0-39,999	2.75 (0.85)	2.47 (0.76)
	\$40,000-79,999	2.72 (0.79)	2.68 (0.63)
	\$80,000+	3.11 (0.61)	2.75 (1.03)
Living with Both Parents Since Birth	Yes	2.71 (0.82)	2.67 (0.70)
	No	2.74 (0.83)	2.57 (0.65)
Mother’s Education	Less than HS	2.77 (0.81)	2.56 (0.67)
	HS diploma	2.65 (0.80)	2.70 (0.66)
	Greater than HS	2.75 (0.80)	2.65 (0.69)

*p ≤ 0.05. **p ≤ 0.01.

School Placement

One way of gauging school success is on-time promotion of students to the next grade. Retention in grade is costly both for the child and society. To provide more detail on the decisions to retain children, placements by grade following kindergarten (second year of the study) and after first grade are reported in this section.

At the end of the second year of the study, nearly all of the students (94.7%) had been promoted into the first grade (Table 2.15), with only 5.3% of students repeating kindergarten. Males were approximately two percentage points more likely to repeat kindergarten. Among racial groups, White students were more likely to repeat kindergarten (5.9%) than African-American (5.0%) or Other Minorities (3.3%). Similar to assessments and ratings, students who had not lived with both parents since birth and whose mothers did not have a high school diploma were significantly more likely to repeat kindergarten. Finally, students from working poor families were significantly more likely to repeat kindergarten.

TABLE 2.15. FALL 2003 PLACEMENTS

-----2003-2004 School Year-----			
Characteristic		% Kindergarten	% First Grade
Overall		5.3	94.7
Gender	Male	6.3	93.7
	Female	4.4	95.6
Race	White	5.9	94.1
	African-American	5.0	95.0
	Other	3.3	96.7
Income	\$0- \$39,999	7.9	92.1
	\$40,000-\$79,999	2.1	97.9
	\$80,000+	9.1	90.9
Working Poor	Yes	8.1	91.2
	No	0.9	99.1
TANF	Received	5.7	94.3
	Did Not receive	5.7	94.3
Living with Both Parents Since Birth	Yes	4.7	95.3
	No	6.4	93.6
Mother's Education	Less than HS	22.0	78.1
	HS Diploma	2.5	97.5
	Greater than HS	4.8	95.2

By the 2004-2005 school year, the year in which students should have been entering second grade, the cumulative effect of decisions to retain students shifted slightly with regard to race and TANF receipt (Table 2.16). Nearly 12% of African-American students were enrolled in the first grade, leaving them a year behind other children their age. This number includes the 5% that had repeated kindergarten the year before.

TABLE 2.16. FALL 2004 PLACEMENTS

-----2004-2005 School Year-----			
Characteristic		% First Grade	% Second Grade
Overall		9.8	90.2
Gender	Male	12.7	87.3
	Female	8.3	91.7
Race	White	10.0	90.0
	African-American	11.9	88.1
	Other	6.7	93.3
Income	\$0- \$39,999	13.2	86.8
	\$40,000- \$79,999	4.9	95.1
	\$80,000+	9.1	90.9
Working Poor	Yes	14.2	85.1
	No	2.8	97.2
TANF	Received	11.9	88.1
	Did Not receive	8.2	91.8
Living with Both Parents Since Birth	Yes	6.1	93.9
	No	16.4	83.6
Mother's Education	Less than HS	31.7	68.3
	HS Diploma	8.2	91.8
	Greater than HS	7.2	92.8

Moreover, while an even number of TANF and non-TANF children were retained in kindergarten (5.7%), 11.9% of TANF recipients were retained in first grade the following year. This compares to 8.2% of children whose families did not receive TANF. The

differences in retention in grade were even larger for children from working poor families. While 8% of these children repeated kindergarten, the following year 14% did not progress with their peers and were enrolled in the first grade. This may be an indication that children in working poor families who do not qualify for cash assistance (TANF) are not receiving services that help them stay in the same grade with other children in their cohort.

In addition, mother's educational level continued to play an important role in grade promotion. By fall 2004, over 30% of children whose mother had not completed high school had repeated either kindergarten or first grade.

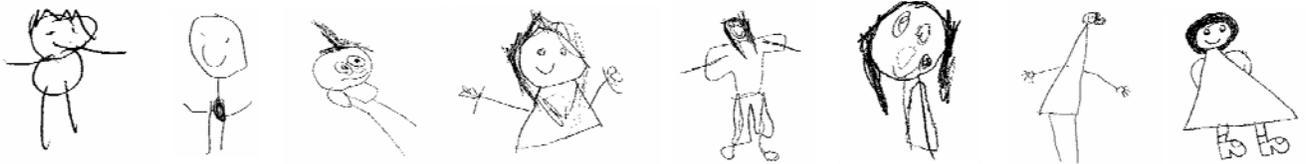
Conclusion

Children in Georgia made significant gains from the beginning of preschool through the end of first grade when compared with national norms for children their ages. They began their preschool experience significantly behind the national norms on most of the assessments where norms were available. However, by the end of first grade they exceeded national norms on their problem-solving skills (WJ-AP), expressive language (OWLS), and pre-reading skills (WJ-LW). On average, children answered more questions correctly at each subsequent assessment.

The findings indicate that child and family characteristics play an influential role in children's developmental processes. Mother's education level and the presence of both parents in the home had significant effects on the child's development of both language and cognitive skills. Children whose mothers did not have a high school diploma entered preschool significantly behind their peers. This significant difference persisted through the first grade. Similarly, children who did not live with both parents since birth also began preschool significantly behind and by first grade were unable to close the gap with their peers who lived with both parents. African-American children did not acquire skills that allowed them to close the gap between themselves and other children in the study.

Finally, economic resources were especially relevant in terms of cognitive development. Children living in families that received TANF or were eligible for means tested benefits scored consistently lower than the other children from preschool through the first grade on math assessments and were more likely to have been retained in grade at least one year.

Family and child characteristics have a great deal of influence on children's development. However, different family characteristics and different parental styles and approaches influence children in different ways. In the next chapter, we provide a closer examination of the effects of families on the development of high-risk children.



The Georgia Early Childhood Study

Chapter 3

Family Influences on the Development of Young Children

Increasingly, publicly funded pre-kindergarten is being looked to as a means to enhance children's skills at an early age and set them on a course for later school success. The Georgia Pre-K program and Head Start in Georgia share this vision. Georgia Pre-K is a universal program, available to all Georgia four-year-olds without any restriction based on family income. However, the skills developed by children who have been on the losing end of the test score gap are very important. Therefore, in this chapter, we concentrate on high-risk children from high-poverty families.

Families significantly influence the development of young children. This chapter presents the findings from an in-depth study of the families of high-poverty children. This study is unique in that it isolates differences between families whose children are beating the odds and those whose children are falling into the all too prevalent pattern of below-average school performance at an early age. The study indicates that parents, who are able to (1) assess their children's strengths and weaknesses, (2) interact with them to set and enforce plans to enhance their success, (3) advocate for them with their teachers and other school officials, and (4) participate in their children's lives as guides and pals are more likely to overcome the effects of poverty. Their children are more likely to perform on par with peers from more affluent families.

Families of High-Poverty Children: Differences that Distinguish Higher and Lower Performing Children

The Effects of Parenting and Approaches to Parenting

Developmental differences are especially pronounced among children who reside in socio-economically disadvantaged households. Survey data revealed that the high-risk children in this study came from families with characteristics such as mothers with low levels of education, low family income, discontinuity in family structure, previous or current welfare receipt, and federal (Medicaid) or state (Peachcare) insurance as the main form of health insurance for the child. Despite the fact that over the course of the three-year study children from all three groups in the GECS made gains relative to the national norms, the at-risk children continued to lag behind their peers within Georgia and across the nation (Henry, et al. 2003).

Related to this finding, previous research has established the validity of using family characteristics to predict children's school success (Baker, Scher, and Mackler, 1997; Coolahan, McWayne, Fantuzzo, and Grim, 2002; Evans, 2004). However, these characteristics reveal only part of the story. Closer analysis of the children from at-risk households demonstrates that despite the tendency of these children to perform below age expectations, many children still perform remarkably well. These children are often labeled as resilient, and we will use this term throughout this report. In an effort to understand what may have contributed to resilient children exceeding age expectations, in-depth qualitative interviews were conducted with parents of children participating in the GECS.

Resilient children from high-risk families are not as small a population as one might surmise. In one study, these children made up approximately one-third of high risk children (Werner and Smith, 1992). Luthar, Cicchetti, and Becker (2000) define the term *resiliency* as the “dynamic process encompassing positive adaptation within the context of significant adversity” (p. 543). Others describe it as a “bouncing back” or rebound process (McCubbin and McCubbin, 1988; Seccombe, 2002). These definitions reflect the belief that resiliency is not dependent upon immutable personality traits or dispositions, but rather reflects social processes through which individuals overcome the difficulties in their environments. Social processes such as the approach to parenting, other adults in the children's lives, and religion may impact the adaptive traits seen in some children (Conger and Conger, 2002; Werner and Smith, 1992).

In this chapter, families of resilient and non-resilient children are contrasted. Interviews were conducted to obtain a comprehensive view of the family and the nature of the parents' interactions with the child in the study. The interviews were relatively open-ended and focused on several specific subjects, including parenting, the role of family, community, and religion in family life, and future goals for the child. From the parents' responses, general themes and factors contributing to success emerged. These themes and factors were analyzed to distinguish families of children who performed above expectations from families of children who performed below expectations.

Sample of Children in the Study of Resiliency

At the onset of this study component, a subset of high-risk children from the Georgia Early Childhood Study was selected. High-risk children are defined as those eligible for means tested benefits such as free or reduced lunch, Medicaid, and/or Temporary Assistance for Needy Families (TANF). Based upon a composite measure of their baseline scores on assessments with national norms, a sample of children who met or exceeded age-based expectations (termed “resilient”) and a group that fell below age-based expectations (termed “non-resilient”) were selected for the in-depth study. Of the 46 children selected and located in a first-grade or kindergarten classroom, interviews were conducted with 36 parents (32 mothers, 2 fathers) or guardians (2 extended family members who had adopted or were in the process of adopting the sample child).

The demographics of families from both groups of children look remarkably similar to each other though different from the total study sample (Table 3.1). Parents of children

in both groups reported mothers with lower levels of education, with an average of a quarter completing less than high school. They also had low earnings with combined family income of less than \$35,000. However, the “non-resilient” children were more likely not to have lived continuously with both parents since birth. In the next sections of the report, we report the similarities and differences in skill

TABLE 3.1. GENERAL FAMILY CHARACTERISTICS OF THE SAMPLE

	Mother’s Education (% < HS)	Income	Child Continuously Living with Both Parents since Birth
Overall Study Sample	11%	4.8	71%
Resilient Children	20%	3.1	71%
Non-Resilient Children	25%	2.7	62%

performance by the two groups of children and compare these with the overall study sample.

Receptive and Expressive Language Skills

Table 3.2 presents the scores of the sample of resilient children, non-resilient children, and the general sample on assessments measuring receptive (PPVT) and expressive language (OWLS). Scores were collected over the course of the study, which encompassed three years of instruction. Children from all three groups began their preschool experience below the national norm on their receptive language skills. However, children from the non-resilient group began preschool more than 1.5 standard deviations below the average and 18.6 points below children from the resilient group. In spring 2003, the end of their kindergarten year, the children from the general and resilient samples had reached the national norm. While the greatest gains were made by the non-resilient children, they were still one standard deviation below the national norm.

TABLE 3.2. RECEPTIVE AND EXPRESSIVE LANGUAGE TEST SCORES AND GAINS FROM PRESCHOOL

	PPVT Fall 2001	PPVT Spring 2003	PPVT Spring 2004	OWLS Fall 2001	OWLS Spring 2003	OWLS Spring 2004
General GECS Sample	93.0	100.7 (+7.7)	97.9 (+4.9)	90.5	96.4 (+5.9)	98.6 (+8.1)
Resilient Children	92.2	101.8 (+9.6)	93.1 (+0.9)	92.6	99.5 (+6.9)	100.4 (+7.8)
Non-Resilient Children	73.6	84.4 (+10.8)	84.1 (+10.5)	74.1	79.1 (+5)	79.1 (+5)
Difference between Resilient and Non-Resilient	18.6	17.4	9.0	18.5	20.4	21.3

All three groups lost ground against the national norms by the end of their first grade year. However, non-resilient children closed the gap with the resilient children by the end of first grade.

The trends were slightly different for expressive language. Children in the general and resilient samples equaled or came close to equaling the national norm at the end of their first grade year. Children in the non-resilient sample remained well below the national norm and did not make gains on their age-group norms during the first grade. Furthermore, after two years of schooling, children in the non-resilient sample were more than 21.3 points below their similar high-risk peers. Unlike the receptive language skills, the gap between the resilient and non-resilient children on their expressive language skills continued to widen.

Letter-Word Recognition and Problem-Solving Skills

Table 3.3 reports similar results for letter-word recognition (WJ-LW) and problem-solving (WJ-AP) skills. Relative to the national norm, children in the general and resilient samples began their preschool year ahead of their peers on their ability to recognize basic letters and sight words. They continued to make gains throughout their kindergarten and first grade year. Children in the non-resilient sample began preschool well below the national norm and well below their high-risk peers in the resilient group. They did not gain on their standardized scores by the end of their kindergarten year; however, they made substantial improvements by the end of their first grade year. The gap in pre-reading skills between the resilient and non-resilient group narrowed by the end of the first grade year, but the resilient children were 9.6 points ahead of their non-resilient peers.

TABLE 3.3. LETTER-WORD RECOGNITION AND BASIC MATH TEST SCORES AND GAINS FROM PRESCHOOL

	WJ-LW Fall 2001	WJ-LW Spring 2003	WJ-LW Spring 2004	WJ-AP Fall 2001	WJ-AP Spring 2003	WJ-AP Spring 2004
General GECS Sample	102.6	112.7 (+10.1)	110.1 (+7.5)	97.1	106.0 (+8.9)	109.2 (+12.1)
Resilient Children	102.4	115.4 (+13)	108.3 (+5.9)	100.7	109.0 (+8.3)	108.3 (+7.6)
Non-Resilient Children	88.7	88.1 (-0.6)	98.7 (+10)	79.1	88.1 (+9)	91.3 (+12.2)
Difference Between Resilient and Non- Resilient	13.7	27.3	9.6	21.3	20.9	17

Children in all three groups made substantial gains on their problem-solving skills throughout preschool, kindergarten, and first grade. The resilient children were well above the national norm and 17 points higher than their non-resilient peers at the end of their first grade year. During the first grade, non-resilient children reduced the gap in applied problem-solving skills, increasing their average score by over 12 points.

In summary, the overall sample and resilient sample demonstrated skills that were at or above the national norms for children in their age group at the end of the first grade. Though the resilient children began their preschool year below the national norm on receptive and expressive language skills, they approached or surpassed the national norm by the end of the first grade year on all four standardized assessments. Children from the non-resilient sample also made gains on their overall assessment scores. However, by the

end of their first grade year, the non-resilient children were still well below the national average in terms of expressive language and problem-solving skills. On letter-word recognition, a skill that can be directly taught and has been greatly emphasized in Georgia's elementary classrooms, the non-resilient children brought their skill level close to the national norm.

The differences between resilient and non-resilient children are both alarming and illuminating. Gaps between the two groups of children from households with substantial disadvantages decreased in three out of four of the skills measured in this study by the end of first grade. Generally, the skill development of the resilient group mirrored that of their peers from more affluent and stable households. However, not until the third year of formal schooling did the non-resilient children begin to close the gap, and at the end of that year, substantial differences still remained.

These findings suggest that home and family life have an impact on children's skill development that can be addressed by formal school, though perhaps not completely. It also suggests that economics and family structure are not the only explanations for differences in skill levels. These findings suggest that family-oriented programs along with formal, developmentally oriented preschools and childcare may be needed to make further reductions in the disparities among economically disadvantaged children. The following section focuses on parental interactions and differences in family and community resources that may provide an explanation for why demographically similar children began preschool with very different skills and responded differently to similar experiences in school.

Parenting Differences: A Sense of Purpose

As the direct assessments attest, children from economically disadvantaged families are not a homogeneous group. Policy programs and research generally treat all low-income families as similar. However, there are striking differences among low-income families. A primary difference that emerged during the interviews of the parents of resilient and non-resilient children was a sense of purpose in parenting.¹ Parents' sense of purpose refers to the motivations and meanings that the parents attach to the relationship between themselves and their child.

When parents discussed their relationship to their child, some parents, generally of children in the resilient group, demonstrated an understanding of the complexity of parenthood and the immense responsibilities and opportunities that parenting entails. These parents also communicated their belief in their ability to alter or change their family's circumstances, especially their child's future. Other parents, generally parents of the non-resilient children, simplified or minimized either their role as parent or their ability to change their life and the life of their child.

¹ It is important to remember the open-ended design of the interview. Interviewers were trained to cover a range of topics and to let the interviewee guide the interview. Therefore, it is significant to note that there are many similarities in the themes that emerged between the two groups. However, in this section we emphasize the differences.

Parents of resilient children were more actively engaged with their children and their teachers when compared to the more passive parents of non-resilient children. In other words, parents of resilient children expressed the beliefs that the lives of their children could be better than their own. These parents seemed to believe that their actions as parents could affect their children's lives. They acted in ways that demonstrated a clear grasp of their children's strengths, weaknesses, and circumstances as well as what needed to be done to support their children.

The parents' sense of purpose plays an overarching role in the four subsequent themes that emerged as important differences between the parents of resilient children and the parents of non-resilient children:

- Parent-Child Interaction
- Value of Education
- Parental Advocacy
- Parent Outlook.

Moreover, parents who acted with a sense of purpose, most often the parents of resilient children, were able to distinguish their role as a guide to their children from their role as a friend or "pal." Of course, effective parenting requires some of both roles, but parents of resilient children were more likely to indicate that they knew which role was more appropriate in a particular situation.

It was not clear from these interviews whether parents' sense of purpose gave rise to the other aspects of parenting practices or if both were influenced by some underlying characteristics or set of life circumstances. These relationships did not appear to always be direct and linear. In some cases, the parents' sense of purpose informed life circumstances. Parents who gave greater meaning to their role as parent were more likely to strive to alter their circumstances. However, in other cases, living situations such as poverty or single-parenthood, influenced all facets of life, impacting the parents' purposefulness. In other words, their circumstances created their perspectives. It is helpful to think of their sense of purpose as existing as a separate and important aspect of parenting that influences and is influenced by the other factors.

Finally, it is important to note that from the onset of the study the intention was not to make judgments about certain parents and their parenting styles and choices. We carefully analyzed the differences in what parents told us in order to contrast the parenting practices and approaches of parents of resilient and non-resilient children. Substantial differences did emerge between the two groups. However, the practices and approaches of the two groups were not mutually exclusive. In summary, parents in the resilient group were more likely to display a strong sense of purpose, higher levels of engagement with their children, and more active roles as guides and advocates for their children.

Parent Child Interaction

Parent-child interactions have two aspects. First, the phrase refers to the amount of time a parent and child spend together or that a parent spends engaged in activities related to the child. Second, it refers to the nature of that engagement or quality of that time. For example, interactions discussed in the interviews included activities outside of the child's school, involvement within the child's school, and their routine day-to-day relations.

Though certainly influenced by outside circumstances, many parents in the study reported a surprising ability to schedule as much time with their child as possible. For example, Ms. J is a single mother who became pregnant with her only child at age 15. At the time of the interview, Ms. J described herself as completely overtaxed. She was completing her nursing degree and was in the middle of her clinicals during which she was working 12 hour shifts. Though she had strong support from her parents in raising her child, at times considering them co-parents, she felt it was important to spend as much time as possible with her child. Throughout the interview, she used the word "we" when referring to their time spent together. For example, she stated that "We play a lot of board games" and "we go out and feed the ducks every morning."

In the interview, Ms. J also displayed knowledge about her child's school and schoolwork. She was able to make distinctions about the strengths and weaknesses of her child's kindergarten and first grade teacher. Additionally, she discussed volunteering in the classroom weekly throughout the previous year.

Ms. J's daughter is resilient. Though Ms. J is fortunate to have the support of her parents, her ability to manage quality time and interactions with her daughter both inside and outside of school appears to be playing a role in her daughter's continued success.

On the other hand, the H's (both parents were present at the interview) did not report the same level of ability to manage quality time with their son, who is in the non-resilient group. Both parents were high school dropouts. The father worked the second shift, which limited the amount of time he could spend with his child. Similar to Ms. J, the child had grandparents in his daily life. When discussing time spent with their son, the H's rarely used the word "we." For example, the father stated "if he's done good at school, then he'll play video games for a couple of hours." Additionally, Mr. H implied that his son has to be old for the family to have fun together by stating, "he's getting [to] the age [when] we can do things together...have fun together."

Furthermore, the H's did not display a clear knowledge of their son's school. Rather than talking in-depth about the difference their son's last two teachers as Ms. J had, the H's simply responded that both were "good" and "sweet" and they "liked" them. Additionally, they did not mention participating in their child's school at any time.

Both Ms. J and the H's discussed the amount and type of time that they were able to spend with their child. Ms. J was much more specific in her responses ("we play these games", "we feed the ducks") and much more likely to indicate she and her child participated in activities together. While the H's had a grasp of their child's activities,

their direct participation seemed minimal. This was especially evident when examining how the two families spent time at their child's school.

Throughout the interviews, parents of resilient and non-resilient children approached parent-child interaction differently. As exemplified by these two families, the care and management of the actual amount of time that was spent between parent and child was clearly distinct. As mentioned earlier, the difference in the two is not simply by choice. Ms. J seemed to have a clear sense of purpose guiding her interactions and was able to act on that sense of purpose with her daughter. Though differences in the amount of time spent with their children were evident, the above two families also illustrated a difference in the way that the parents' sense of purpose influenced the quality of time that was spent with their children.

Value of Education

Value of education refers to the way that the parents view and communicate their beliefs about the value of education. It is important to note that when asked, all parents agreed that they valued education and wanted their child to learn and do well in school. Most parents of children in both groups reported reading to their child at least every other day and often every day. However, upon closer inspection, clear differences between the resilient and non-resilient groups emerged. In the discussions of parent-child interactions during the interviews, one difference in how the value of education is communicated emerged. Parents of children categorized as resilient were more likely to display a working knowledge of their child's school. Parents of non-resilient children reported that they knew their child's teacher, but usually that was the extent of their knowledge.²

A second difference in the value of education was in the parents' knowledge of and responses to their child's academic skills, including behavioral skills. Clear differences emerged as parents talked about their child's ability and success in school. Parents of children in the resilient group displayed views that indicated they possessed an understanding of their child's abilities.

For example, Ms. V (married mother of three, works full-time, husband on disability) related to the interviewer that her resilient son displayed behavioral problems when he became bored in school. She stated that "you have to make it somewhat exciting for him or give him something important to look forward to in order to keep him going." Additionally, she discussed how her son "loves school at times" and "hates school at times," depending upon how stimulated he was in the classroom.

She also was able to discuss her child's specific abilities and needs stating, "he needs that extra little help...he give[s] up too fast. If he [doesn't] know it and he gets frustrated, then he just gives up." Ms. V also related that her daughter had been helping her son with his school work lately and that had made a considerable difference.

² It is important to mention that there were a couple of cases of parents of children categorized as non-resilient who had extensive knowledge of their child's classroom experience. Usually this related to behavioral problems of the child or the parent attempting to manage the child's education in an almost antagonistic relationship with the teacher.

In contrast to Ms. V, Ms. L (single mother, high school dropout, unemployed) did not have a grasp of the severity of her non-resilient son's discipline problems. She discussed the treatment that her son received from the principal after taking items belonging to the classroom and other students home with him. According to Ms. L, the principal had paddled her son, explaining that this behavior was not acceptable and could lead to theft in the future. Ms. L did not seem to recognize her son's behavior as a problem stating that, "he didn't use it; he was just bringing it home, and he'd take it back to school everyday."

Additionally, this mother revealed that her son had been tested and prescribed Aderol. However, Ms. L did not administer the medication to him on the weekends. She felt that if he did not misbehave at home, he did not need it.

Whereas Ms. V grasped her son's behavioral problems and developed solutions, Ms. L did not convey that she understood that her son had problems or that she had any means to address them. In fact, later in the interview she indicated that she had been working to improve his ability to focus on television in order to help him in school.

A third area that distinguished the resilient children from their non-resilient peers was in the way their parents valued their own education. The parents of resilient children in the sample were more likely to have either achieved higher education or were in the process of returning to school.

For example, Ms. V clearly valued her own education by stating that "I give my kids the motivation to go to school and get an education." Additionally, she hoped that her example would inspire her children when she stated, "Mom and Dad got a diploma. Mom and Dad went to college."

Furthermore, she was realistic in her expectations for her son, with the long-term goal of getting him through high school. She stated that "if I could get [him] through high school, that's a big accomplishment." Additionally, she hoped that her son would continue in school, either in college or a vocational school. However, she repeated that her first goal was to get him through high school.

In contrast with Ms. V, Ms. L had a different educational path that informed her expectations for her son. Ms. L, whose child was non-resilient, had dropped out of high school several times for personal reasons and never finished. At the time of the interview, stated that she hoped to complete her GED though she had no stated plan for doing so.

The importance of parental education upon the child's educational goals was borne out when Ms. L discussed her hopes for her son's future. In contrast to the specificity that Ms. V expressed when discussing her goals for her son's education, Ms. L did not seem to understand the educational process. She simply stated that she would like him to "play football" or be a "doctor."

Parental educational values were encompassed in several aspects of the interviews: interaction with the school, understanding of their child's educational abilities, and most

importantly, knowing and communicating the value of education. In this facet, there were clear differences between the samples. Parents of resilient children were more likely to report specific involvement in their child's school, greater understanding of their child's ability, and more focused and realistic educational values. The key to this concept is not that parents of children in the non-resilient sample did not value education, they clearly did. However, parents of children in the resilient sample had the tools to formulate goals that were focused and realistic.

Parental Advocacy

The third distinction that emerged between the groups was parental advocacy. This concept is defined in this report as how much of a difference parents feel they can make in their children's lives and the actions that they take in relation to those feelings. This facet is linked to two distinct but associated perceptions: 1) the belief by the parents that their actions lead to consequences; and 2) the realization that they can make a difference in their children's lives.

Parents of children in the non-resilient group, at times, conveyed a sense that they did not have a clear understanding that their actions would lead to consequences. Furthermore, this inability to link actions and consequences rendered them less likely to advocate on their child's behalf, especially in their child's educational progression.

Ms. N, the mother of a child with a birth defect, exemplified this disconnect. At the time of the interview, her daughter was placed in a special education class, in addition to having been retained in kindergarten. Ms. N did not convey a sense that any of her actions may have contributed to her child's situation. This was most evident in a conversation during which she admitted that she allowed her six-year-old daughter to miss school. Throughout the conversation she laughed when she talked about her daughter "playing hooky... about once out of the week." Ms. N did not seem to grasp the potential seriousness of the situation, laughing when she talked about her daughter missing so much school.

A recurring theme among parents of children in the non-resilient group focused on the idea that their child's education was primarily the school's responsibility. They did not see themselves as partners in their child's education, rather they acted more like bystanders. Ms. N related her disappointment that her child's after-school program did not bring her up to grade level, stating that "she still failed a grade. I thought that would have help[ed] her, but it didn't." However, the mother never mentioned in the interview any action that she had taken to help her child avoid retention.

Ms. N, like other parents within this non-resilient sample, clearly did not convey that any of her actions, related to her child's education, have had any consequences. Not all of the parents from this group expressed similar attitudes. In fact, many detailed the sacrifices that they had made to advocate for their children. Ms. C openly expressed her worry about her child and discussed her plan to meet with the school about her child's academic problems. She felt that the school was not doing enough, stating that "they're telling me they may fail her in first grade." Yet she expressed frustration with this decision

explaining that “I want to find out why she’s having more trouble at school than... she is at home when she reads to me.”

While many parents (some in both samples though less frequently in the resilient group) reported frustration with the school system, they also expressed a desire to keep their child protected and dependent. This may have hindered the parents from teaching their children to advocate for themselves. Ms. C provided an example of this dichotomy. She admitted that she wanted to keep her child young, stating “I want to keep her a baby, I guess.” This may have kept her child from asserting herself in school and therefore possibly put the child at risk of retention in first grade.

Finally, Ms. B’s son is in the resilient sample, despite having been diagnosed with bipolar disorder. Because of this condition, she felt the strong need to be directly involved in her son’s education and with the school. She used her presence to advocate for her child, talking “on a week-to-week basis” with his teacher “over the phone or ... at the school.” She attended PTO, SST meetings, and class parties. Additionally, she and her son were involved in a school-sponsored reading club, receiving three new books by mail each month.

Parental advocacy is strongly related to the idea that the parental actions can lead to specific consequences, particularly with regard to their child’s education. Advocacy is clearly aligned with a parent’s sense of purpose. Parents demonstrated how their own actions -- advocating on behalf of their child -- can affect the child’s outcomes. In the case of Ms. B, she clearly believed that her involvement with the school had an impact her son’s education. At the other extreme, Ms. N did not make the association that allowing her child to miss school may lead to serious consequences. In fact, Ms. N seemed to dismiss the idea through laughter. Finally, Ms. C seemed to understand how her actions, though not necessarily her attitudes, may help her child. However, she felt excluded from the educational process.

Parental Outlook

Parental outlook is strongly related to parental advocacy. Parents’ language demonstrated particular attitudes about how their actions influenced their own situation and their ability to alter their circumstances. Many parents of children in the non-resilient group used language that indicated that they viewed life in pessimistic, fatalistic, or predestined terms. However, parents in the resilient group focused on their ability to change both their own and their children’s circumstances.

Katherine Rosier (2000) found similar themes of hopelessness and fatalism in her study *Mothering Inner-City Children* that took an in-depth look into the lives of lower-income, inner-city black mothers and their children. She also found that mothers with a sense of self-reliance and independence avoided these disempowering themes (Rosier, 2000). Our findings are consistent with hers. For example, the way in which parents made sense of, or interpreted, their past demonstrated this theme. Many of the parents in the sample expressed regret about early-in-life pregnancies or not finishing school. However, some parents were clearly able to make the best out of unfortunate circumstances, while others simply resigned themselves to their situation.

Ms. J, a previously mentioned mother of a resilient child, expressed that she used her early pregnancy as motivation to improve her life. She stated that “it made me grow up a lot...[my daughter] got me going straight in school, going from C’s to straight A’s.” This mother then went on to relate that not only did she learn from her mistake, but she hoped her child would learn as well.

Regret was also a common theme when parents talked about their past education. Many of the parents had dropped out of high school. Though most had returned and received a GED, they still wished that they had made different choices.

Mr. H, a previously mentioned father of a non-resilient child, related his thoughts and disappointments in his decision to drop out of high school. He explained, “I got a car, had a girlfriend... so money became a big issue. I wanted money now... I didn’t think and... make the better choice.”

Both Ms. J and Mr. H seemed to express some remorse about choices that they had made. Yet, in the first example, the parent was able to take her regret and translate it into a more promising life for her child. Later in the interview she directly acknowledged the powerful lesson her daughter could learn from her mistake. The father declared regret for his choice but did not indicate what he learned or that his mistake could become a positive lesson for his son.

It is also important to look at differences in the way that parents view their life today. Many parents in both samples discussed the role of religion in their life. In fact, religion was one of the most common themes cited; in many ways it is hard to distinguish between the two samples with regard to this theme. However, one difference that did emerge was the way that religion was used by parents in each sample. Primarily in the non-resilient group, the parents expressed a belief in determinism, that their actions would not affect how their lives worked out. In contrast, parents of children in the resilient group were more likely to use religious faith as an inspiration to take action.

In this latter category, Ms. V, the mother a resilient child, provided a clear example. She described herself as being in-between religions (Jehovah’s Witness and Methodist), and had not yet chosen a faith. However, she did feel a certain calling to help others around her. This was something she learned from her own mother “because she used to be the one to feed the neighborhood kids.” She went on to state that now she has taken on that role in her own neighborhood: “That’s what it seems like... I am the one feeding the neighborhood kids with the little that we have.”

Her faith also guided her to motivate others to change their lives. She spoke often of prayer, viewing it as an influential act, not simply something you do with the hope it will be answered. She counseled her children, “Whatever you want to do, you can do it.”

Ms. W, the mother of a non-resilient child, on the other hand viewed religion as deterministic. She was very active in her faith and very structured with her child. Whereas, Ms. V saw her faith as something that influenced her to be more active, Ms.

W's religion taught her that her life had been predetermined by a higher power. When asked about her daughter, she stated that "God gave her to me for a reason. That I know."

In summary, parental outlook seems to have a bearing on children's lives. Parental actions or inaction, especially in regard to their child's education, may be dependent upon their view of the malleability of their own situation and their child's life. This outlook derived from a number of factors including their own upbringing, their experiences, and their religious beliefs.

The Roles of Parents: Guides and Pals

A parent's sense of purpose influences their parent-child interactions, their values about education, and their parental advocacy. Each of these, in turn, helps shape parental outlook. Taken together, these influence the way that adults parent their children. The nature of parenting roles developed in this study can be meaningfully reduced to two contrasting roles: guides and pals.

Of course, parents can be both guide and pal. Many parents in the resilient group used language indicating that they were able to differentiate when it was appropriate to be a guide and when it was appropriate to be a friend in their child's life. Parents in the non-resilient group responded to inquiries about themselves as parents in language that either revealed a harsh parenting style, with little knowledge of the nature of childhood, or a lenient parenting style that demonstrated that they were not able to see themselves as a guide in their child's life. In other words, the parents of resilient children acted as either guides or pals depending upon the situation, but parents of non-resilient children seemed to remain in one mode, often as strict and demanding guides or as pals seeking their child's approval.

One mother of a resilient child expressed these contrasting roles when she stated, "[of] course you want to be your child's friend, but you can't take it too far. You've got to be their parent...you can't let them run your house."

Ms. A, the mother of a non-resilient child, provided an example of a strict parent, unable to act as a friend to their child when appropriate. Compared to the other parents in the sample, her family was relatively financially secure. She and her husband, the child's father, had been married for eight years, had steady jobs, and owned their home. However, their child had behavioral issues at school. In her attempt to remedy her child's problems, Ms. A appeared to have created such a structured environment that her daughter was not allowed to time to be a child. She stated that "... Monday through Thursday she doesn't get to watch TV at all. We're at the table with homework..."

On the other end of the spectrum was Ms. W, a mother of a non-resilient child mentioned in the above section. Though, she provided her child with all of the necessary resources, her language revealed that her child was a constant companion, stating that "we shower together, bathe together, and when I go to bed, she's right with me." It appeared that her daughter helped her as much as she helped the child. It became evident throughout the interview that the child had few friends and received little guidance from her mother,

who worked two jobs. Ms. W saw her daughter as her pal and acted as a friend rather than a guide.

Finally, Ms. F displayed a balance between the roles of guide and friend. Though she spent more time as a guide, she understood the need to provide both types of parenting. When discussing homework, she stated that “if you get home and do your homework, you can play.” One night her daughter did not do her homework and instead spent the evening complaining and “fussing” about wanting to play outside. After this incident, “now she does it. If you have the time, use it. Why waste it sitting there goofing off.”

In her role as friend, Ms. F stated that she thought it was important to apologize to her children when she made a mistake. She stated that “I don’t think it is beyond a parent to show that we can make mistakes too. They grow from it, and I grow from it.”

Parental interaction, educational values, parental advocacy, and outlook follow from and influence a parent’s sense of purpose. The meanings and motivations parents create for their actions are keys to understanding their parenting styles that ultimately affect outcomes for their children. Purpose influences their parenting practices and their overall parenting approach, including whether or not parents see themselves as a guide, a pal, or are able to combine both roles.

Conclusion

Children from economically disadvantaged families are not a homogeneous group, as this study illustrates. There are many children in at-risk families who perform as well as their more affluent counterparts. However, a group of these children perform significantly below the national norm and significantly below their economic peers, especially in the beginning years of schooling.

Gaps between the two groups of children from households with substantial disadvantages decreased in three out of four skills measured in this study by the end of first grade. Generally, the skill development of the resilient group mirrored that of their peers from more affluent and stable households. However, not until the third year of formal schooling, the first grade, did the non-resilient children begin to close the gap. Moreover, by the end of that year, substantial gaps still remained. These differences between resilient and non-resilient children lead to more questions concerning how to help close this learning gap.

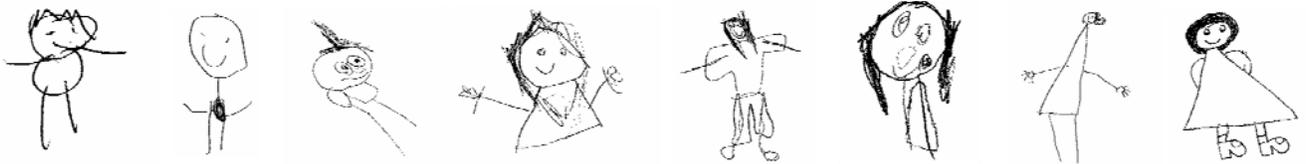
It was not until the end of the third year that the non-resilient children began to close the gap on their peers. One question to explore in future studies is how kindergarten can be used to encourage larger gains by non-resilient children at an earlier age. It is unclear why the non-resilient children were able to make such substantial gains in first grade, despite stagnating or falling further behind during kindergarten. One explanation is that they are not fully prepared for formal schooling when entering kindergarten. The year in kindergarten allows them time to adjust to school so that they are able to gain ground academically by the time they enter the first grade.

A second, related question is what types of programs could foster more productive parental advocacy and more positive child-parent interactions. Such a program would lead to parents: 1) engaging in higher quality interactions with their children, 2) engaging with their child's school in meaningful ways, and 3) developing and acting with a clear sense of purpose in regard to their child's education. A full understanding of their role and their abilities as a parent may allow parents to ease their children's transition into kindergarten. This would ensure that their children have constructive interactions with their teachers, that their children's strengths and weaknesses are accurately assessed, and that effective strategies for instruction and overall development are implemented.

The Resource Coordinator program, administered by Bright From the Start: The Georgia Department of Early Care and Learning, is an example of the type of program that could be used for these purposes. This program is for category 1 (low income) children enrolled in the Pre-K program. These resource coordinators work with families to help ensure parental education about needed resources and assist in the transition to kindergarten. An evaluation is currently underway to assess the effectiveness of this program for low-income families. The results of the GECS study of resilient children could be used in combination with the current program evaluation to assist in targeting the activities of this program.

Finally, the third question that warrants attention is whether programs, such as the Resource Coordinator Program, can be targeted during the preschool year to children in the non-resilient group. For example, the resource coordinators could identify non-resilient children early in the Pre-K year. This early identification could lead to targeted services for the parents. This type of targeting, if followed up with effective services, may allow these children to post gains in kindergarten similar to the ones that they are presently showing in first grade.

Another option is to expand Pre-K services to economically disadvantaged three-year-olds, especially from families most likely to have non-resilient children. In the previous chapter, families with low levels of parental education, single parent households, and households receiving TANF were shown to have children with lower skill levels. A first step could be to build a more integrated partnership with other publicly funded programs, in particular with Head Start. Expanded cooperation between the Georgia Pre-K Program and Head Start may lead to refinements that could benefit children living in poverty. For example, Head Start may be able to shift some resources to provide more economically disadvantaged three-year-olds with comprehensive family services and an earlier introduction to preschool. These children could receive medical, dental, and sight and hearing screenings at an earlier age than many of them do now. Moreover, they could receive developmentally oriented preschool services from Head Start providers that have been shown to be effective in studies of Early Head Start.



The Georgia Early Childhood Study

Chapter 4

Development of Four-Year-Olds in Georgia: Differences by Program

One important purpose of preschool is to prepare children for kindergarten and future school success by developing the skills, behaviors, and attitudes that will contribute to success in school. The purpose of this chapter is to describe the influence of children's preschool experiences on their developmental progress from the beginning of preschool through the end of first grade. This chapter will report some of the developmental differences between groups of children from three preschool programs and a separate group of children who did not attend a formal, full-day, preschool program. It is important to realize that children's developmental status at the end of first grade is partially dependent upon the level at which they started, as well as the influence of their family and environment.

In this chapter, the status of Georgia's early elementary students at the end of first grade as well as their gains over time, are presented on several important measures of development. The comparisons of the four groups of children cannot be construed as an estimate of the impact of each program. There are two main reservations in attributing any differences to the children's preschool program. First, parents chose their child's preschool; and second, different children may develop skills and attitudes at different rates. If parents have made optimal preschool choices for their children, the children will, on average, experience the highest levels of developmental outcomes that are possible.

Overall, students enrolled in the study made significant gains on both the language development and problem-solving skills by nearly doubling their raw scores between preschool and the end of first grade. Moreover, students from each program gained at approximately the same rate. Across all standardized tests, Georgia's elementary students made advances against national norms when compared with their performance prior to preschool. However, Georgia's first graders lost ground against the national norms on word identification and vocabulary, though their scores remained at or above the national norms for their age group on all four standardized assessments for which trend data was available.

This chapter describes differences in the developmental outcomes that were presented in chapter 2. The overall gains and the average for each program type, including those with

no formal preschool, are reported through the end of first grade or the latest point at which the outcome was measured. Sections are divided by the subject areas referenced earlier: language development and communication, cognition and general knowledge, social and emotional skills, health and well being, readiness, and attitudes toward school and learning. Finally, we present and analyze differences in placements including decisions to retain students in grade.

Language and Communication Skills

Georgia’s first graders scored close to or above the national norms on all five standardized assessments of language and communications skills. Students enrolled in Georgia’s Pre-K program exceeded the national norms on letter-word identification at every point they were assessed. For the first time in the study, they exceeded the national norms on expressive language skills by the end of first grade. Children in all four groups were able to answer more questions correctly in each test period than they had in the prior period and experienced similar growth rates. However, important differences in the scores appeared when categorized by the type of preschool the children attended. (For a complete breakdown of the three years of raw and standardized scores, please see Appendix E and F).

Differences in Overall Raw Score Changes

Overall, students enrolled in the study made significant gains on the language development direct assessments by nearly doubling their raw scores between preschool and the end of first grade. Moreover, across all program types, students from each program gained at approximately the same rate.

Specifically, on their receptive language skills (PPVT), the original sample of children gained 43.3 points over the three-year period. However, an examination of these scores by preschool program type revealed interesting trends. All three programs began their preschool year on significantly different achievement levels. At the end of first grade, students who had been enrolled in Head Start finished first grade significantly behind students enrolled in the other types of programs. Students who had been enrolled in a private preschool or who did not attend formal preschool performed better on this assessment than Pre-K students at the end of the first grade (Table 4.1).

TABLE 4.1. RECEPTIVE LANGUAGE (PPVT) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3-group sample – 3 yr.)	93.8 (16.5)	+43.3
	Including all (4-group sample – 2 yr.)	95.3 (16.8)	+23.0
Georgia Pre-K		94.3 (16.0) ^{c,d}	+43.4
Head Start		83.6 (13.7) ^b	+44.6
Private		100.4 (15.4)	+42.6
Non-Preschool		98.7 (17.1)	+23.9*

^b Head Start differs from Pre-K, private, and non-preschool.

^c Pre-K differs from private.

^d Pre-K differs from non-preschool.

* $p \leq 0.05$.

In their beginning reading skills and ability to identify letters (WJ- Letter Word), preschoolers in the study gained an average of 29.2 points by the end of first grade (Table 4.2). This is a significant gain from their preschool average. Students enrolled in a private preschool outperformed their peers on this assessment, gaining an average of 31.6 points by the end of first grade, compared to 29.7 points for Pre-K students and 25.9 points for Head Start students. Head Start students began preschool significantly behind

TABLE 4.2. WJ- LETTER WORD END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3-group sample – 3 yr.)	36.5 (7.8)	+29.2
	Including all (4-group sample – 2 yr.)	36.9 (7.9)	+21.7
Georgia Pre-K		37.0 (7.1) ^c	+29.7
Head Start		31.2 (8.1) ^b	+25.9
Private		40.2 (6.4)	+31.6
Non-Preschool		37.9 (8.2)	+22.4*

^b Head Start differs from Pre-K, private, and non-preschool.

^c Pre-K differs from private.

*p≤0.05.

their peers and ended first grade even further behind. For example, Head Start students were 2 points behind their Pre-K counterparts at the beginning of preschool. By the end of first grade, they were testing 5.8 points behind the same students.

Children’s expressive language skills (OWLS) took on a similar trend to the reading skills tests. Over the three years, students more than doubled their raw scores from 23.3 in preschool to 49.3 by the end of first grade (Table 4.3). On average, Pre-K and private preschool students began preschool significantly different from each other, and both gained 26.5 points by the end of first grade. However, students enrolled in Head Start began preschool significantly behind both Pre-K and private preschool students and gained an average of 24.5 points by the end of first grade.

TABLE 4.3. EXPRESSIVE LANGUAGE (OWLS) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3 group sample – 3 yr.)	49.3 (9.8)	+26.0
	Including all (4 group sample – 2 yr.)	50.1 (10.0)	+9.5
Georgia Pre-K		50.2 (9.6)	+26.5
Head Start		43.1 (8.8)	+24.5
Private		53.1 (8.6)	+26.5
Non-Preschool		51.9 (10.0)	+10.0*

*p≤0.05.

Finally, with regards to phonemic awareness, a predictor of later success in reading, students enrolled in a private preschool gained 7.3 points between the beginning of kindergarten and the end of first grade on the Elision sub-test (Table 4.4). This compares to a 6.4 point gain by students enrolled in Pre-K and 4.9 points by students enrolled in Head Start over the same time period.

TABLE 4.4. PHONEMIC AWARENESS (CTOPP- ELISION) END OF FIRST GRADE DEVELOPMENT – RAW SCORE

Characteristic		Spring 2004	Fall K to Spring 1 st Change
Overall	No non-preschool (3 group sample – 3 yr.)	8.9 (4.5)	+6.2
	Including all (4 group sample – 2 yr.)	10.6 (2.9)	+7.6
Georgia Pre-K		9.2 (4.4) ^c	+6.4
Head Start		6.6 (3.4) ^b	+4.9
Private		10.8 (4.8)	+7.3
Non-Preschool		9.7 (4.7)	+6.2

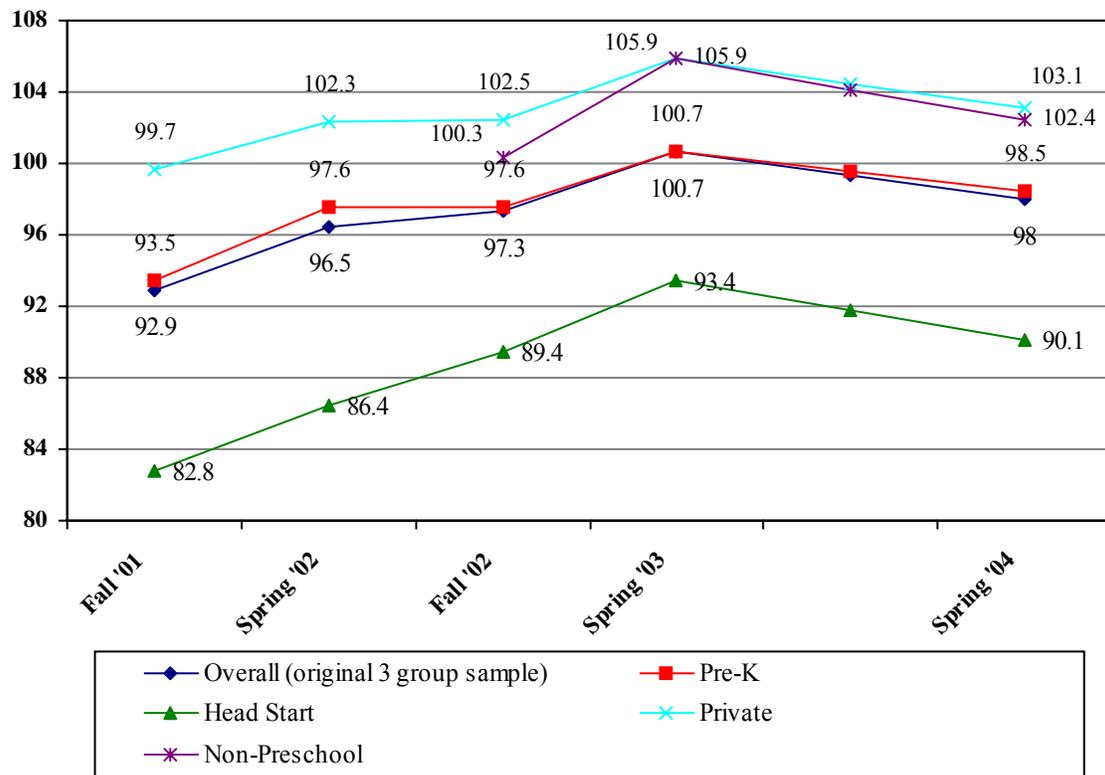
^b Head Start differs from Pre-K, private, and non-preschool.

^c Pre-K differs from private.

Gains Relative to National Norms

As presented in Chapter 2, on the standardized tests, there was an increase in receptive language skills (for a complete breakdown of outcomes by program type, see Appendix F). Across all three standardized tests used to assess these skills, students made gains against the national norm compared with their preschool scores (Figure 4.1).

FIGURE 4.1. PPVT STANDARDIZED SCORE

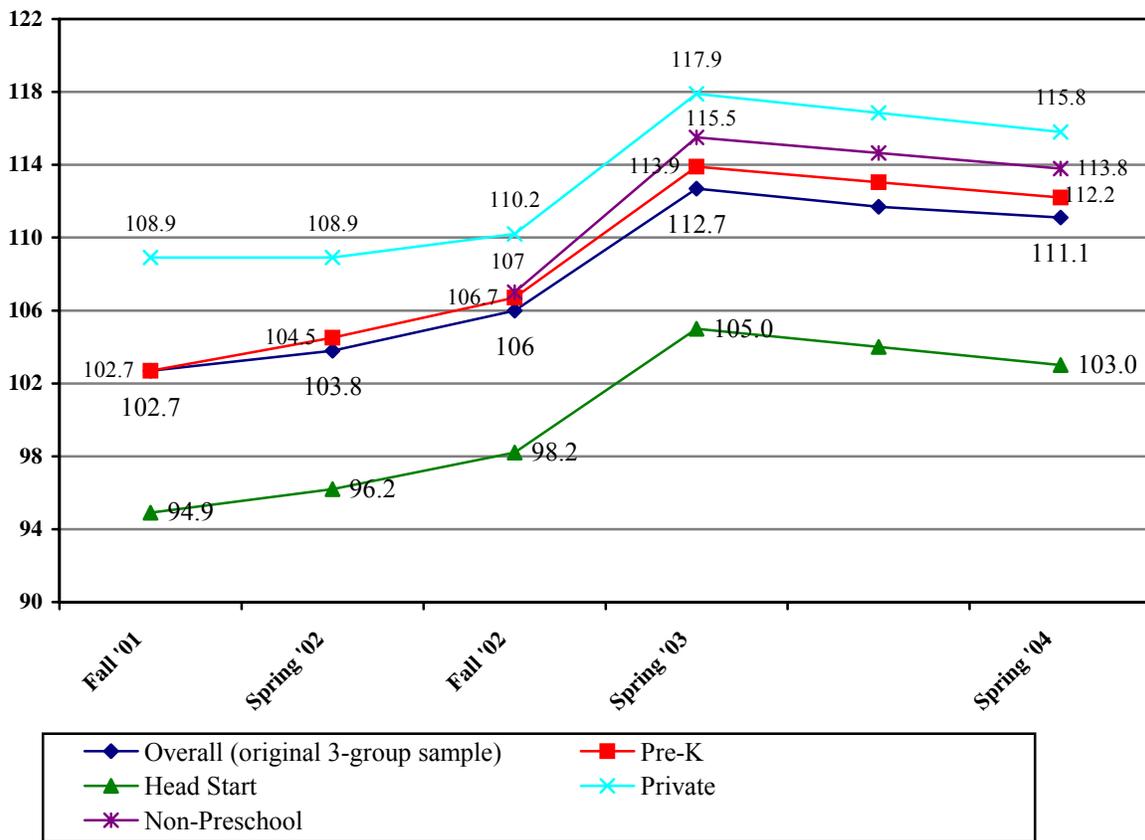


In terms of receptive language, overall, students began preschool behind the national norm (92.9), but had reached it by the end of their kindergarten year (100.7). However, by the end of their first grade year, the students had dropped slightly below the national norm (98.0).

When analyzed by program type, there were significant differences. Students enrolled in the Head Start program consistently tested below the national norm and significantly behind their peers. Students enrolled in the Pre-K program exceeded the national norm and significantly behind their peers. Students enrolled in the Pre-K program exceeded the national norm by the end of kindergarten but fell slightly below it by the end of first grade. Students who either enrolled in a private preschool program or did not attend an all day four-year-old program consistently performed at or above the national norm.

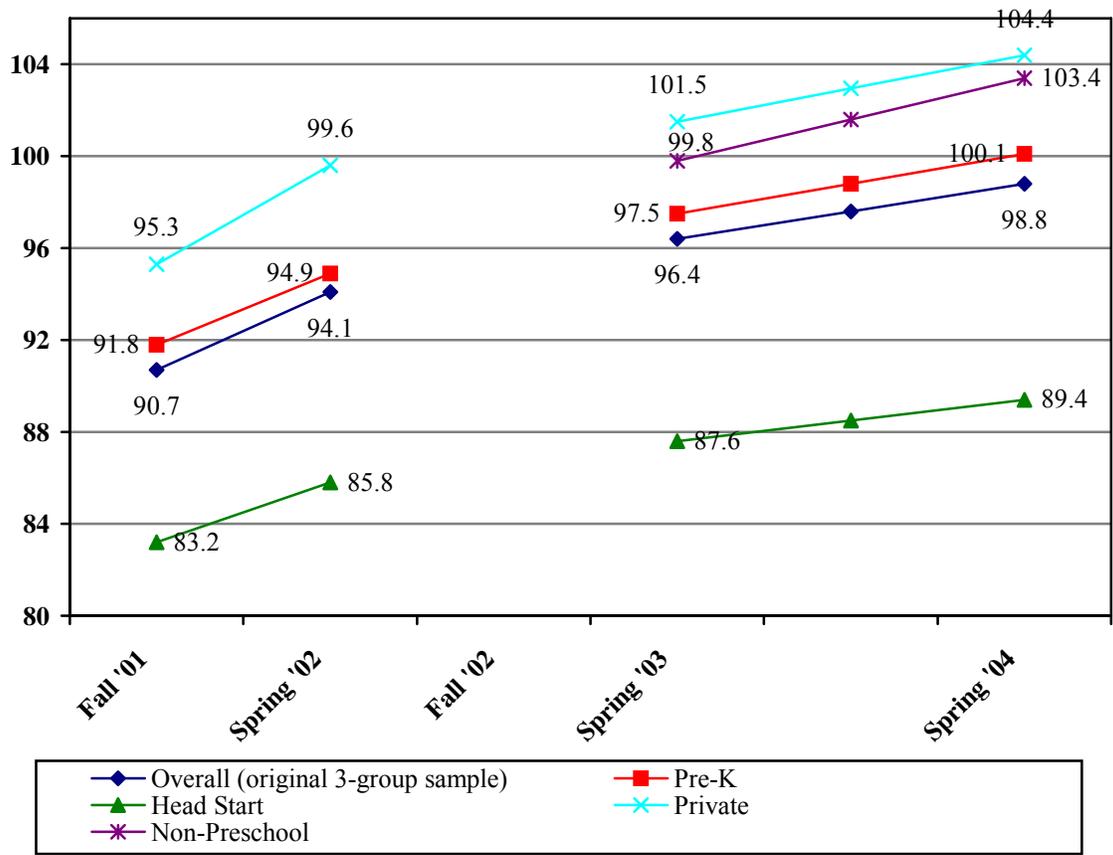
On tests to assess their ability to identify letters and words (WJ- Letter Word), students in the study began preschool above the national average and remained there through the first grade (Figure 4.2). When analyzed by program type, students enrolled in Head Start were consistently and significantly behind their peers enrolled on other types of programs. However, the Head Start students did make significant gains, and by the end of their kindergarten year were also above the national norm. Though their scores dropped slightly during first grade, Head Start students remained above the norm through the end of first grade. Students enrolled in Pre-K, a private program or no preschool at all, consistently scored above the national norm.

FIGURE 4.2. WJ- LETTER WORD STANDARDIZED SCORE



In terms of expressive language (OWLS), students in the study began preschool behind the national norm (Figure 4.3). However, each year they were able to gain on the national norms. As with the other language and communication tests, there were significant differences between students enrolled in Head Start and those enrolled in other

FIGURE 4.3. OWLS STANDARDIZED SCORES



programs. By the end of the first grade, students who had been enrolled in Pre-K, a private program, or no program had caught up to and exceeded the national norm.

Factors Influencing First Grade Assessment Outcomes

For this study, it was important to understand both the gains posted by children and their skills at the end of first grade. Ideally, preschool programs will stimulate gains and success in early education. Two approaches were used to assess outcomes at the end of first grade. The first focused on language skills at the end of first grade. In this method, the child’s individual and family characteristics were controlled when the effects of their preschool setting were analyzed. The second approach looked at gains over time and differences at the end of first grade simultaneously. However, since the second approach could only be used for skills that were directly assessed throughout the study, we present the results of the first approach for all of the developmental outcomes analyzed in this chapter.

Across all three tests, scores at the beginning of preschool (baseline) were closely related to scores at the end of first grade (Table 4.5). However, on both the receptive language and expressive language skills tests, African-American students scored significantly lower than White students. Lower income children scored significantly lower on the

TABLE 4.5. COMPARING EFFECTS OF CHILD AND FAMILY CHARACTERISTICS ON LANGUAGE AND COMMUNICATION SKILLS

	Receptive Language (PPVT)	WJ - Letter- Word Recognition	Expressive Language (OWLS)
Baseline	0.56***	0.79***	0.66***
Age at school entry	-0.37	1.06	-0.25
Gender (Boy = 1)	2.08*	-0.71	1.04
Other Race	1.22	1.20	0.14
African – American	-2.70*	0.03	-2.70**
Mother’s Ed. (Less than HS =1)	-2.80	-1.73	-2.83
Mother Ed. (More than HS =1)	1.47	0.10	0.65
Not lived with both parents since birth	-2.23	-0.94	0.21
Pre-K	0.37	0.57	0.00
Income	-0.23	-0.27*	0.00
TANF	1.56	1.21	-1.29
Working Poor	0.56	0.79	0.66
Intercept	64.55***	22.98***	35.46***

*p≤0.05. **p≤0.01. ***p≤0.001.

Letter-Word Recognition than their more affluent counterparts. After controlling for individual and family characteristics, there were no significant differences between children who had been enrolled in Pre-K and those who had been enrolled in other types of preschool programs.

The second method for estimating the influences of individual child, family, and program characteristics is to analyze gains over time using a Hierarchical Linear Model (HLM) to estimate the effects of a specific program on the developmental trajectory of a group of children. All preschoolers made significant developmental gains on all three language and communication skills tests between preschool and first grade (Table 4.6). Overall, the results of this model suggest that across all three assessments, children enrolled in Pre-K gained skills at similar rates to children attending either private preschool or Head Start.

In a similar model comparing children who attended Georgia Pre-K with those enrolled in either Head Start or private preschool, Pre-K students made higher gains on letter and word identification than children in Head Start. The gain for Pre-K attendees amounted to nearly 2.5 more correct answers from the beginning of preschool until the end of first grade on top of the increase of nearly 30 questions answered correctly by the average child over the same period. In no case did the gains posted by private preschoolers significantly exceed those of Pre-K attendees.

TABLE 4.6. PREDICTORS OF CHILDREN’S DEVELOPMENTAL STATUS AT THE END OF FIRST GRADE AND THEIR RATES OF GROWTH FROM PRESCHOOL THROUGH FIRST GRADE (PRE-K VS. OTHER PROGRAM)

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification
Model for status at end of 1 st grade			
Mean status at end of 1 st grade	94.0*** (1.07)	47.8*** (0.54)	35.2*** (0.47)
Georgia Pre-K (1)/Other program	0.55 (1.32)	1.08 (0.86)	1.06 (0.60)
Age	10.6*** (1.94)	4.38*** (1.32)	4.04*** (1.00)
Boy	1.90 (1.10)	-1.22 (0.69)	-2.18*** (0.58)
African-American (1)/White	-6.92*** (1.76)	-3.82** (1.25)	-1.57 (0.87)
Other race (1)/White	-0.37 (2.47)	-0.31 (1.45)	3.19* (1.30)
Income	0.87* (0.40)	0.37 (0.25)	0.69** (0.21)
TANF	-2.00 (1.79)	-1.19 (0.76)	-0.32 (0.87)
Working Poor	0.36 (1.33)	-0.82 (1.41)	-0.10 (0.46)
Mother ed HS (1)/Mother ed < HS	0.11 (1.93)	2.87* (1.15)	1.12 (0.95)
Mother ed > HS (1)/Mother ed < HS	7.83** (2.32)	6.46*** (1.44)	3.39* (1.31)
Not lived with both parents since birth	-2.09 (1.96)	0.24 (1.03)	-0.44 (0.81)
Model for rates of growth from PS-1 st grade			
Mean rate of change from PS-1 st grade	26.4*** (3.86)	15.4*** (2.17)	9.59*** (1.90)
Georgia Pre-K (1)/Other program	-0.43 (0.57)	0.27 (0.33)	0.30 (0.25)
Age	-1.97* (0.83)	-1.18* (0.47)	0.33 (0.41)
Boy	1.43** (0.48)	0.72** (0.27)	-0.16 (0.24)
African-American (1)/White	0.41 (0.80)	-0.76 (0.47)	-0.50 (0.37)
Other race (1)/White	1.07 (1.35)	0.79 (0.57)	0.38 (0.54)
Income	-0.14 (0.20)	-0.04 (0.09)	0.07 (0.08)
TANF	-0.05 (0.85)	0.12 (0.38)	0.03 (0.34)
Working Poor	0.71 (2.13)	-0.46 (0.46)	-0.23 (0.71)
Mother’s ed HS (1)/Mother ed < HS	-0.60 (0.89)	0.27 (0.44)	0.35 (0.35)
Mother’s ed > HS (1)/Mother ed < HS	-0.10 (0.97)	0.49 (0.51)	0.56 (0.54)
Not lived with both parents since birth	-0.35 (0.95)	0.23 (0.34)	-0.40 (0.38)

*p≤0.05. **p≤0.01. ***p≤0.001.

Communication Readiness Score

In addition to the direct assessments, preschool, kindergarten, and first grade teachers were asked to rate the students’ communication skills ranging from 1 “extraordinarily poor” to 7 “extraordinarily good.” Overall, the students received an approximate rating of ‘good’ (average of 5) on their communication skills (Table 4.7). Across the six time periods, children who had been enrolled in Head Start were rated consistently lower than those enrolled in other programs. For all groups, the first grade teachers rated the children’s communication skills much lower at the beginning of the first grade year (in fall 2003) than the kindergarten teachers had at the end of the year (in spring 2003). However, ratings of communications skills rebounded by the end of first grade.

TABLE 4.7. COMMUNICATION SKILLS BY PROGRAM TYPE

Communication Skills	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall – 3-group sample	4.7(1.1)	5.0(1.1)	4.9(1.3)	5.4(1.2)	4.8(1.2)	5.2(1.2)
Overall – 4-group sample	N/A	N/A	4.9(1.3)	5.5(1.2)	4.9(1.2)	5.3(1.2)
Georgia Pre-K	4.7(1.1)	4.9(1.2)	5.0(1.2)	5.6(1.2)	4.9(1.2)	5.3(1.2)
Head Start	4.7(1.0)	5.1(1.0)	4.0(1.2)	4.7(1.2)	4.2(1.0)	4.6(1.1)
Private	4.7(1.0)	5.2(1.2)	5.3(1.1)	5.6(1.2)	5.3(1.0)	5.6(1.0)
Non-Preschool	N/A	N/A	5.0(1.4)	5.7(1.1)	5.2(1.2)	5.4(1.2)

Factors Influencing First Grade Communication Outcomes

Teacher ratings of students' communication skills at the end of first grade were significantly related to their preschool (baseline) performance on the language standardized assessments. All three language tests were significant predictors of student communication skills (Table 4.8). Moreover, boys had significantly lower communication skill ratings than girls. While Pre-K students' communication skills were rated higher than others after controlling for family and child characteristics, the difference was not significant.

TABLE 4.8. FACTORS INFLUENCING COMMUNICATION SKILL RATINGS

	Spring 2004 Communication Rating
Baseline PPVT	0.01**
Baseline OWLS	0.02*
Baseline WJ – Letter Word	0.03*
Baseline WJ – Applied Problems	0.02
Age at school entry	0.16
Gender (Boy = 1)	-0.25*
Other Race	-0.05
African-American	-0.11
Mother's Ed (Less than HS =1)	-0.27
Mother Ed (More than HS =1)	0.01
Not lived with both parents since birth	-0.28
Pre-K	0.04
Income	-0.01
TANF	-0.28
Working Poor	-0.01
Intercept	3.54**

*p≤0.05. **p≤0.01. ***p≤0.001.

Cognitive and General Knowledge

As stated in Chapter 2, Georgia's first graders scored above the national norms for all three standardized assessments for cognitive skills by the end of first grade. However, the overall gains on each test varied by preschool type. All students were able to answer more questions correctly in each test period than they had in the prior period and experienced similar growth rates. (For a complete breakdown of the three years of raw and standardized scores, please see Appendixes G and H).

Differences in Overall Raw Score Changes

Like the language and communication tests, students more than doubled their mathematics raw scores across the three-year study period. On basic problem-solving skills (WJ-AP), students gained an average of 15.4 points across three years (Table 4.9). Students enrolled in each program type began their preschool year significantly different from each other. However, children enrolled in Head Start and Pre-K were able to slightly close the gap between their scores and those of their private preschool counterparts, rendering the differences insignificant.

TABLE 4.9. WJ- APPLIED PROBLEMS END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3-group sample – 3 yr.)	26.1 (3.9)	+15.4
	Including all (4-group sample – 2 yr.)	26.4 (3.9)	+9.4
Georgia Pre-K		26.3 (3.8)	+15.5
Head Start		24.0 (3.8)	+15.2
Private		27.5 (3.3)	+15.1
Non-Preschool		27.0 (3.8)	+9.6*

*p≤0.05.

In terms of basic calculation and math fluency skills, children enrolled in Head Start began kindergarten with significantly lower overall scores than the other groups and were unable to keep pace with their peers, falling further behind. They ended their first grade year scoring significantly lower on both tests (Table 4.10 and Table 4.11).

TABLE 4.10. WJ- CALCULATION END OF FIRST GRADE DEVELOPMENT – RAW SCORE

	Characteristic	Spring 2004	Overall Change
Overall	No non-preschool (3-group sample – 3 yr.)	9.7 (2.8)	+5.1
	Including all (4-group sample – 2 yr.)	9.8 (2.7)	+5.0
Georgia Pre-K		9.8 (2.3)	+5.0
Head Start		8.2 (2.9) ^b	+4.8
Private		10.6 (3.5)	+5.2
Non-Preschool		10.0 (2.2)	+4.8

^b Head Start differs from Pre-K, private, and non-preschool.

TABLE 4.11. WJ- MATH FLUENCY END OF FIRST GRADE DEVELOPMENT – RAW SCORE

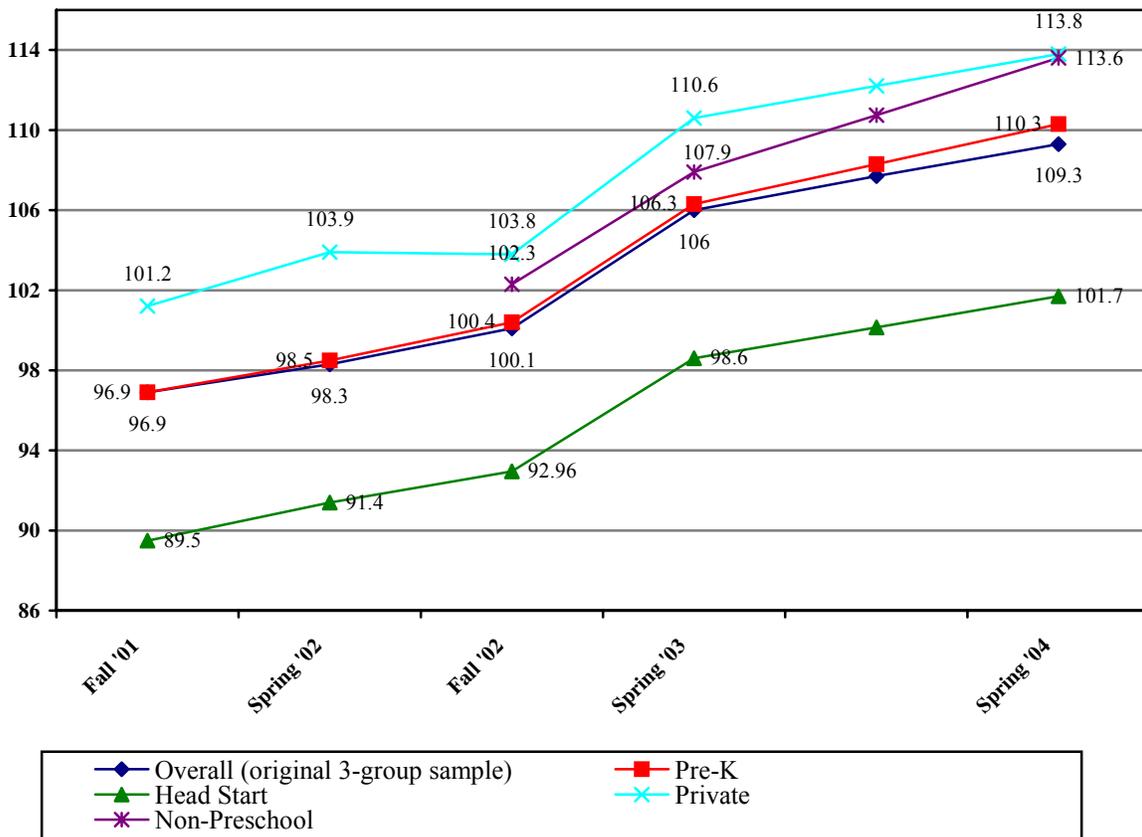
Characteristic		Spring 2004	Overall Change
Overall	No non-preschool (3-group sample – 3 yr.)	31.4 (12.2)	+21.4
	Including all (4-group sample – 2 yr.)	31.7 (12.1)	+21.3
Georgia Pre-K		32.0 (12.4)	+21.6
Head Start		26.6(12.6) ^b	+20.2
Private		34.5 (9.8)	+22.0
Non-Preschool		32.5 (11.7)	+21.4

^b Head Start differs from Pre-K, private, and non-preschool.

Gains Relative to National Norms

In terms of problem-solving skills, Georgia students in this study began their preschool year slightly behind the national norm. However, by the beginning of kindergarten, they had equaled the norm, and had well exceeded it by the end of first grade (Figure 4.4). When analyzed by program type, students enrolled in Head Start were consistently and significantly behind their peers enrolled in other programs. However, the Head Start students made significant gains, and by the end of first grade were above the national norm. Students enrolled in Pre-K, private programs, or no preschool at all, consistently scored well above the national norm.

FIGURE 4.4. WJ – APPLIED PROBLEMS STANDARDIZED SCORE



Factors Influencing First Grade Cognitive Outcomes – Assessments

As with language and communication skills, there are two approaches used to examine factors that influence a child’s development. The first is a statistical approach (regression) that controls for the child’s individual and family characteristics, including each child’s skills prior to preschool. This approach also allows comparisons between Pre-K participants with other children. The second approach analyzes gains over time using a Hierarchical Linear Model (HLM) to estimate the effects of a specific program on the developmental trajectory of a group of children.

Using the first statistical approach, race and mother’s education were significant factors in acquisition of math skills (Table 4.12). Students whose mothers had not completed high school scored significantly lower on applied problem-solving and calculation assessments than children whose mother had a high school diploma. Additionally, boys were able to complete fewer calculations correctly than girls. Race and age at school entry were influential in the outcome of the Math Fluency assessment. Both African-American students and Other Minorities, including Hispanic and Asian-American students, scored significantly higher than White students. Although children attending Pre-K scored higher than others in problem-solving and calculation skills, the differences were not significant.

TABLE 4.12. COMPARING EFFECTS OF CHILD AND FAMILY CHARACTERISTICS ON COGNITIVE OUTCOMES

	Applied Problems	Calculation	Math Fluency
Baseline	0.47***	0.36***	0.60***
Age at school entry	0.58	1.03	4.65**
Gender (Boy = 1)	-0.10	-0.01**	-1.55
Other Race	0.97	0.52	4.81*
African-American	-1.05**	0.09	3.13**
Mother’s Ed. (Less than HS =1)	-1.66***	-1.14**	-4.49
Mother Ed. (More than HS =1)	-0.52	0.11	-1.40
Not lived with both parents since birth	-0.41	0.12	0.06
Pre-K	0.11	0.14	-1.43
Income	0.43	-0.12	1.19
TANF	-0.13	0.36	0.60
Working Poor	0.47	0.36	1.41
Intercept	18.47***	2.49	1.40

*p≤0.05. **p≤0.01. ***p≤0.001.

The second method for estimating the influences of individual child, family, and program characteristics (HLM) on the gains in children’s skills revealed that children made significant improvements between preschool and first grade on their problem-solving skills (WJ-Applied Problems). In addition, the results of this model indicate that students enrolled in Pre-K ended first grade with more problem-solving skills than children enrolled in other programs. Their gains in these skills since the beginning of preschool were higher but not significantly so (Table 4.13). Younger children, children whose mothers had not received a high school diploma, and African-American children

TABLE 4.13. PREDICTORS OF CHILDREN’S DEVELOPMENTAL STATUS AT THE END OF FIRST GRADE AND THEIR RATES OF GROWTH FROM PRESCHOOL THROUGH FIRST GRADE (PRE-K VS. OTHER PROGRAM)

	Applied Problem-Solving
Model for status at end of 1st grade	
Mean status at end of 1 st grade	26.1*** (0.32)
Georgia Pre-K (1)/Other program	0.81* (0.41)
Age	2.53*** (0.59)
Boy	-0.15 (0.35)
African-American (1)/White	-2.20*** (0.55)
Other race (1)/White	1.18 (0.78)
Income	0.45* (0.15)
TANF	0.16 (0.48)
Working Poor	0.41 (0.44)
Mother ed HS (1)/Mother ed < HS	1.10* (0.48)
Mother ed > HS (1)/Mother ed < HS	0.51 (0.81)
Not lived with both parents since birth	-0.00 (0.39)
Model for rates of growth from PS-1st grade	
Mean rate of change from PS-1 st grade	8.07*** (1.19)
Georgia Pre-K (1)/Other program	0.20 (0.15)
Age	-0.43 (0.26)
Boy	0.20 (0.15)
African-American (1)/White	-0.02 (0.27)
Other race (1)/White	0.36 (0.37)
Income	-0.00 (0.05)
TANF	0.22 (0.22)
Working Poor	0.41 (0.44)
Mother ed HS (1)/Mother ed < HS	0.37 (0.24)
Mother ed > HS (1)/Mother ed < HS	-0.44 (0.31)
Not lived with both parents since birth	-0.11 (0.21)

*p≤0.05. ***p≤0.001.

ended first grade with fewer problem-solving skills. However, rates of growth since preschool were similar for all of the children.

Academic Skills Ratings

When asked to rate basic academic skills on the scale of 1 “extraordinarily poor” to 7 “extraordinarily good”, children averaged (4.4) from slightly above average (4.0) at the beginning of their preschool year to a high of nearly very good (5.8) at the end of kindergarten. These ratings fell slightly by the beginning of first grade (Table 4.14).

The children who attended Head Start had the lowest academic skills ratings when compared to all other groups. While children in the other groups steadily progressed during their preschool and kindergarten years, the children from the Head Start program had significantly lower ratings during the kindergarten year than the other groups.

TABLE 4.14. ACADEMIC SKILLS RATINGS BY PROGRAM TYPE

Academic Skills	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall— 3-group sample	4.4(1.1)	4.7(1.2)	4.8(1.4)	5.8(1.1)	4.5(1.4)	5.2(1.3)
Overall – 4-group sample	N/A	N/A	4.8(1.5)	5.8(1.1)	4.6(1.4)	5.2(1.3)
Georgia Pre-K	4.4(1.1)	4.6(1.2)	4.9(1.4)	5.9(1.0)	4.5(1.4)	5.2(1.2)
Head Start	4.2(1.0)	4.6(1.4)	3.9(1.4)	4.9(1.3)	3.6(1.3)	4.5(1.4)
Private	4.9(1.1)	5.1(1.1)	5.4(1.1)	6.2(0.8)	5.3(1.0)	5.6(1.0)
Non-Preschool	N/A	N/A	4.7(1.6)	5.9(1.1)	4.7(1.3)	5.4(1.3)

Factors Influencing Academic Skills

A student’s performance on the WJ- Letter Word and Applied Problems prior to preschool was positively and significantly related to their academic skills ratings score at the end of first grade (Table 4.15). Moreover, a student whose mother did not finish high school was rated significantly lower on their academic skills than a student whose mother had a high school diploma. The academic skills ratings of children who participated in Pre-K were similar to those of the other groups at the end of first grade.

TABLE 4.15. FACTORS INFLUENCING ACADEMIC SKILL RATINGS

	Spring 2004 Communication Rating
Baseline PPVT	0.01
Baseline OWLS	0.01
Baseline WJ – Letter Word	0.05**
Baseline WJ – Applied Problems	0.07**
Age at school entry	0.18
Gender (Boy = 1)	-0.14
Other Race	0.23
African-American	0.04
Mother’s Ed. (Less than HS =1)	-0.49***
Mother Ed. (More than HS =1)	0.04
Not lived with both parents since birth	-0.15
Pre-K	-0.05
Income	-0.00
TANF	-0.16
Working Poor	0.03
Intercept	2.91

p≤0.01. *p≤0.001.

Social Behaviors

Overall, children’s behavior did not appear to keep pace with teachers’ behavioral expectations. When asked to rate behavioral skills on the scale of 1 “extraordinarily poor” to 7 “extraordinarily good”, children averaged from nearly very good (4.8) at the beginning of their preschool year to slightly above average (4.3) at the end of first grade (Table 4.16).

TABLE 4.16. SOCIAL BEHAVIOR RATINGS BY PROGRAM TYPE

Behavioral Ratings	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall – 3-group sample	4.8(1.1)	5.0(1.2)	4.9(1.2)	5.3(1.3)	5.0(1.4)	4.0(0.8)
Overall – 4-group sample	N/A	N/A	5.1(1.2)	5.4(1.3)	5.1(1.4)	4.1(0.8)
Georgia Pre-K	4.9(1.2)	4.9(1.2)	5.1(1.2)	5.4(1.2)	5.1(1.4)	4.1(0.8)
Head Start	4.7(1.0)	5.1(1.2)	4.3(1.1)	4.7(1.3)	4.4(1.2)	3.8(0.9)
Private	4.8(1.1)	5.0(1.2)	5.0(1.3)	5.3(1.4)	5.1(1.5)	4.0(0.9)
Non-Preschool	N/A	N/A	5.3(1.2)	5.7(1.2)	5.4(1.3)	4.3(0.8)

While students in Head Start were rated lower than their peers, on average, all students were rated lower by their first grade teachers than by their kindergarten teachers. Children who attended either Georgia Pre-K or a private preschool program scored similarly on teacher ratings of behavior. Their scores differed by no more than one tenth of a point on any report. The children who did not attend preschool were rated highest on their behavior.

Factors Influencing Behavior Ratings

The analysis of social behavior does not indicate any characteristic of the children or their families significantly affects their ratings. Controlling for these characteristics, Pre-K children were rated slightly higher than others, but insignificantly so (Table 4.17).

TABLE 4.17. FACTORS INFLUENCING BEHAVIOR RATINGS

	Spring 2004 Behavioral Ratings
Baseline PPVT	0.00
Baseline OWLS	0.00
Baseline WJ – Letter Word	0.01
Baseline WJ – Applied Problems	0.00
Age at school entry	0.19
Gender (Boy = 1)	-0.18
Other Race	0.23
African-American	-0.07
Mother’s Ed. (Less than HS =1)	-0.00
Mother Ed. (More than HS =1)	0.08
Not lived with both parents since birth	-0.14
Pre-K	0.17
Income	0.00
TANF	-0.09
Working Poor	0.01
Intercept	2.76**

**p<0.01.

The ability to focus and stay on task is important to school success. However, like the behavioral ratings, students were not able to keep pace with teacher expectations. When asked to rate the students’ ability to stay on task using the scale of 1 “extraordinarily poor” to 7 “extraordinarily good”, Georgia’s preschoolers averaged from above very good (5.13) at the end of kindergarten year to slightly below average (3.68) at the end of first grade (Table 4.18). Georgia Pre-K participants were rated more persistent than other

TABLE 4.18. TASK PERSISTENCE RATINGS

Task Persistence	Spring 2003	Fall 2003	Spring 2004
Overall— 3 group sample	5.13 (1.6)	4.67 (1.7)	3.68 (1.0)
Overall – 4 group sample	5.46 (1.4)	5.18 (1.6)	3.86 (1.0)
Georgia Pre-K	5.30 (1.6)	4.74 (1.7)	3.79 (1.1)
Head Start	4.46 (1.5)	4.02 (1.4)	3.32 (1.0)
Private	5.28 (1.6)	5.06 (1.7)	3.70 (0.9)
Non-Preschool	5.4 (1.3)	5.18 (1.7)	3.86 (0.9)

preschoolers, but the difference was insignificant. Children who did not attend full-time preschool were rated as having the highest levels of task persistence.

Factors Influencing Task Persistence

Gender and race were significant factors in the ratings of students' task persistence. Boys were rated significantly lower on task persistence than girls (Table 4.19). Hispanic and Asian students (Other Minorities) had significantly higher task persistence ratings than White students.

TABLE 4.19. FACTORS INFLUENCING TASK PERSISTENCE RATINGS

	Spring 2004 Task Persistence
Baseline PPVT	0.00
Baseline OWLS	0.01
Baseline WJ – Letter Word	0.02
Baseline WJ – Applied Problems	0.03
Age at school entry	0.24
Gender (Boy = 1)	-0.48**
Other Race	0.40**
African-American	0.17
Mother's Ed. (Less than HS =1)	-0.37
Mother Ed. (More than HS =1)	0.05
Not lived with both parents since birth	-0.30
Pre-K	0.06
Income	-0.03
TANF	-0.25
Working Poor	-0.06
Intercept	2.39

** $p \leq 0.01$.

Health and Well-Being

One of the primary goals of the Head Start program is to promote the general health and well-being of children enrolled in the program. During the Head Start year (2001-2002), teachers reported gains in the health and well-being of their students (Table 4.20). However, the children were unable to maintain the advantage in these ratings after leaving the program. Both kindergarten and first grade teachers rated the health and well-being of children who had been enrolled in Head Start lower than that of their peers.

TABLE 4.20. HEALTH AND WELL-BEING RATINGS BY PROGRAM TYPE

Health & Wellness	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004
Overall --3-group sample	5.5(1.0)	5.6(1.0)	5.7(1.1)	5.8(1.1)	5.6(1.1)	5.7(1.1)
Overall – 4-group sample	N/A	N/A	5.7(1.1)	5.8(1.1)	5.7(1.1)	5.8(1.1)
Georgia Pre-K	5.5(1.0)	5.5(1.1)	5.8(1.1)	5.9(1.1)	5.7(1.1)	5.8(1.1)
Head Start	5.3(1.0)	5.6(1.0)	5.2(1.1)	5.3(1.2)	5.1(0.9)	5.5(1.1)
Private	5.5(0.9)	5.7(0.9)	5.9(0.9)	6.0(0.9)	5.8(1.1)	5.8(1.1)
Non-Preschool	N/A	N/A	5.7(1.1)	5.9(1.0)	5.8(1.1)	6.0(1.0)

When comparing the overall ratings with the ratings by program type, the children who attended Georgia Pre-K, private preschool, and those who did not attend preschool scored equivalent to or higher than the overall average. The children from Head Start consistently scored lower than the overall average on ratings of health and well-being over time.

Factors Influencing Health and Well-Being

Gender and family structure influence children's health and well-being. Boys had significantly lower health ratings than girls (Table 4.21). Moreover, students who had not lived with both parents since birth also had significantly lower health ratings. Children who attended Georgia Pre-K were rated as neither more nor less healthy than other children.

TABLE 4.21. FACTORS INFLUENCING HEALTH AND WELL-BEING RATINGS

	Spring 2004 Health and Well-Being
Baseline PPVT	0.01
Baseline OWLS	0.01
Baseline WJ – Letter Word	0.01
Baseline WJ – Applied Problems	0.03
Age at school entry	0.34
Gender (Boy = 1)	-0.32**
Other Race	0.15
African-American	0.20
Mother's Ed. (Less than HS =1)	-0.34
Mother's Ed. (More than HS =1)	0.07
Not lived with both parents since birth	-0.36**
Pre-K	-0.05
Income	-0.01
TANF	-0.21
Working Poor	-0.11
Intercept	3.92***

p<0.01. *p<0.001.

Readiness

At the end of their preschool year (spring 2002), teachers were asked to rate their students' readiness for kindergarten on a scale from 1 "extraordinarily poor" to 7 "extraordinarily good." In the fall of 2002, kindergarten teachers were asked to rate the same children on their readiness for kindergarten (Table 4.22). Overall, the students received a "good" rating in terms of their developmental preparedness for kindergarten. However, kindergarten teachers rated children who had been enrolled in Head Start (4.3) closer to "average" (4.0). Similarly, first grade teachers rated Head Start students closer to 'average' when asked about first grade readiness in the fall of 2003.

TABLE 4.22. READINESS SCORES BY PROGRAM TYPE

Readiness	Spring 2002	Fall 2002	Spring 2003	Fall 2003
Overall – 3-group sample	5.3(1.3)	5.2(1.5)	5.6(1.5)	5.1(1.6)
Overall -- 4-group sample	NA	5.2(1.6)	5.7(1.4)	5.2(1.6)
Georgia Pre-K (SD)	5.2(1.3)	5.4(1.4)	5.8(1.3)	5.1(1.5)
Head Start (SD)	5.3(1.3)	4.3(1.6)	4.5(1.7)	4.2(1.5)
Private (SD)	5.6(1.1)	5.7(1.3)	6.0(1.2)	5.7(1.4)
Non-Preschool (SD)	N/A	5.3(1.7)	5.8(1.3)	5.4(1.6)

The children who attended private preschool scored the highest across all time periods on teacher ratings of readiness. Interestingly, the children who did not attend any preschool scored equal to or higher than the children who attended Georgia Pre-K and Head Start on teacher ratings of readiness. Georgia Pre-K is aimed at preparing Georgia's children for public school, and children served by this program are rated consistently above "good" by their teachers. It should be noted that the differences in average readiness ratings do not control or compensate for differences in families or parental choice of preschool.

Attitudes Toward School

Children's Attitude Toward Schooling, CATS (Mashburn and Henry, 2004), a new assessment tool, was introduced to investigate the children's attitudes towards a variety of school activities and specific subjects. Students and teachers were separately asked to rate how engaged the student was in their school on a scale of 1 "does not like at all" to 4 "really likes it." On average, there was not much variation among students on their attitudes, which averaged just below "liked it." However, teachers did not believe that the children were as positive about school as the children themselves indicated (Table 4.23).

TABLE 4.23. CHILDREN'S ATTITUDE TOWARD SCHOOL

	Characteristic	Child CATS	Teacher CATS
Overall	No non-preschool (3-group sample – 3 yr.)	2.76 (0.8)	2.55 (0.7)
	Including all (4-group sample – 2 yr.)	2.69 (0.7)	2.72 (0.7)
Georgia Pre-K		2.69 (0.8)	2.61 (0.7)
Head Start		2.88 (0.8)	2.40 (0.7)
Private		2.82 (0.7)	2.49 (0.6)
Non-Preschool		2.69 (0.7)	2.72 (0.7)

Factors Influencing CATS

Some interesting trends are revealed when the child and teacher answers are compared. African-American children were significantly more likely to report higher levels of satisfaction with school than White children (Table 4.24). This was the only significant difference expressed by the children. However, from the teacher's perspective, academic performance played a larger role. Receptive language skills (PPVT), and problem-solving skills (WJ-AP) were both significantly related to teachers' ratings of children's attitudes toward school and learning. Also, boys were rated significantly lower than girls on their school attitudes by their teachers. However, when self-reported by the children, boys were neither more nor less positive about school than girls.

TABLE 4.24. CHILD ATTITUDE TOWARDS SCHOOL

	Child CATS	Teacher CATS
Baseline PPVT	-0.00	-0.01*
Baseline OWLS	-0.00	0.01
Baseline WJ – Letter Word	-0.01	0.03
Baseline WJ – Applied Problems	0.01	0.04**
Age at school entry	0.27*	0.244
Gender (Boy = 1)	-0.07	-0.27**
Other Race	0.22	0.12
African-American	0.22**	0.19
Mother's Ed. (Less than HS =1)	0.15	-0.18
Mother's Ed. (More than HS =1)	0.02	0.07
Not lived with both parents since birth	-0.02	-0.08
Pre-K	-0.12	0.06
Income	0.03	-0.01
TANF	0.03	0.13
Working Poor	0.04	-0.25
Intercept	1.43*	1.20

*p<0.05. **p<0.01.

School Placement

By the end of kindergarten, a majority of the children (94.3%) were promoted to the first grade (Table 4.25). When examined by program type, students who attended Head Start were significantly more likely to repeat kindergarten (13.6%) than other students. Children who attended Pre-K were the least likely to repeat kindergarten (2.8%), an important indicator of school readiness.

TABLE 4.25. 2003-2004 PLACEMENT DATA

-----2003-2004 School Year-----			
Characteristic		Kindergarten Placement	First Grade Placement
Overall	No non-preschool sample	5.3	94.7
	Full sample	5.5	94.3
Pre-K		2.8	97.2
Head Start		13.6	86.4
Private		4.4	95.6
Non-Preschool		5.9	94.1

For the 2004-2005 school year, 90% of the students in the Georgia Early Childhood Study had been promoted to the second grade (Table 4.26). Head Start students were significantly less likely to be promoted with nearly 23% retained in the first grade for the 2003-2004 school year. Of the students enrolled in Pre-K, nearly 8% were retained in first grade, up from the 2.8% that repeated kindergarten.

TABLE 4.26. 2004-2005 PLACEMENT DATA

-----2004-2005 School Year-----			
Characteristic		First Grade Placement	Second Grade Placement
Overall	No non-preschool sample	9.8	90.2
	Full sample	9.8	90.2
Pre-K		7.9	92.1
Head Start		22.7	77.3
Private		4.4	95.6
Non-Preschool		8.3	91.7

Factors Influencing Placement

Mother's education level appeared to effect promotion and retention rates among kindergarten and first-grade students (Table 4.27). If a mother did not complete high school, that student was significantly more likely to repeat kindergarten and be placed in an Early Intervention Plan (EIP) kindergarten program for children who need additional support. Children who were younger when they started school were more likely to repeat a grade. However, the only significant factors effecting EIP placement in the first grade were family structure and gender. Children who had not lived with both parents since birth were significantly more likely to have an EIP placement by the first grade than children who had lived with both parents. Finally, boys were significantly more likely

TABLE 4.27. COMPARING EFFECTS OF CHILD AND FAMILY CHARACTERISTICS ON PLACEMENT

	Kindergarten EIP Placement	2003-2004 Placement ^a	First Grade EIP Placement	2004-2005 Placement ^b
Age at school entry	-3.51	-1.66*	-0.35	-2.05***
Gender (Boy = 1)	-0.81	0.26	1.17*	0.54
Other Race	-2.01	-1.29	-0.76	-1.03
African-American	1.44	-0.15	-0.28	-0.31
Mother's Ed. (Less than HS =1)	3.99**	2.75***	0.90	2.01***
Mother's Ed. (More than HS =1)	0.88	0.74	-0.60	0.19
Not lived with both parents since birth	0.38	0.16	-1.15*	0.28
Pre-K	-0.09	-0.10	-0.25	-0.17
Income	-1.29	-1.17	0.05	-0.55
TANF	1.48	0.40	-0.19	0.38
Working Poor	-3.51	-1.67	-0.35	-2.05
Intercept	8.45	4.74	0.27	7.25**

^a 1 = 1st Grade.

^b 1 = 2nd Grade.

*p≤0.05. **p≤0.01. ***p≤0.001.

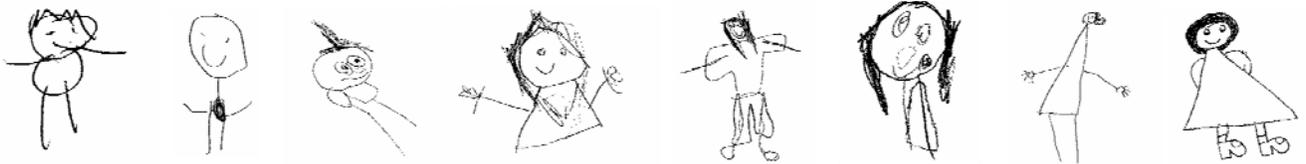
than girls to have had an EIP placement in the first grade. It is important to note that neither factor had a significant effect on EIP placement in kindergarten. Children who participated in Georgia's Pre-K program were less likely to be retained or placed in an EIP program; however, these differences were not significant.

Conclusion

Georgia's preschoolers posted significant gains since the beginning of preschool compared to the national norms for children their age. For the children who were enrolled in preschool, their skills at the end of first grade reflected differences in their skills at the beginning of preschool. This may indicate that the Georgia Pre-K Program has provided a preschool experience that has allowed most parents to choose a beneficial experience for their children as four-year-olds. Children who participated in Pre-K had attained similar skills as the other children by the end of first grade.

Pre-K participation was associated with more positive outcomes than other preschool experiences on 11 of 16 measures. However, in no case was the difference statistically significant during the first grade. This is not an assessment of the effectiveness of Georgia Pre-K: children who participated in the Pre-K program gained more skills than they began with relative to the national norms. The growth of skills for these Pre-K children is parallel to the growth of other children, including those in private programs and Head Start. One way to interpret these findings is that children enrolled in private programs and Head Start, which is almost two times as costly as Georgia Pre-K (Barnett, et al 2004), developed skills at the same rate as children in the Pre-K program.

In the next chapter, we assess the extent to which the test score gap is closed by Georgia's Pre-K program for minority children and those children from high-poverty families.



The Georgia Early Childhood Study

Chapter 5

Effects of Georgia Pre-K on Children in Poverty and Minorities

While families have the most substantial impacts on the skill development of young children, most publicly funded pre-kindergarten programs share the goal of preparing children to be successful in school, especially those whose family resources may jeopardize their chances for success. In this chapter, we estimate the differential effects of the Georgia Pre-K program on four groups of such children: children whose families receive Temporary Assistance for Needy Families (TANF) or cash subsidies from the government; children whose families are part of the working poor (i.e. they qualify for government aid, but not TANF); low income children; and minority children, including both African-Americans and other minorities.

We build on the analysis presented in Chapter Four to estimate the effects of preschool options on these four groups of children. The analysis provides an estimate of the increased benefit of attending Georgia Pre-K for children in each of these four categories over and above the benefits received by other children attending Head Start or private preschool.

In all three categories children benefited by attending the Georgia Pre-K program more than the overall positive effects registered cumulatively by all of Georgia's preschoolers in this study. Children from families that received TANF were able to identify more letters and words at the end of first grade if they attended the Georgia Pre-K program. Children from families classified as working poor posted similar benefits. Moreover, the program appeared to help children from lower income families close the gap between themselves and more advantaged peers in letter and word identification (Table 5.1).

TABLE 5.1. EFFECTS OF GEORGIA PRE-K ON RELATIONS BETWEEN CHILD CHARACTERISTICS AND RATES OF GROWTH FROM PRESCHOOL THROUGH FIRST GRADE*

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification	Applied Problem-Solving
Model 1: Georgia Pre-K*TANF (se)	2.8 (2.3)	-0.02 (1.4)	2.30 (1.1)*	0.39 (0.5)
Model 2: Georgia Pre-K*Income (se)	-0.10 (0.3)	-0.08 (0.3)	-0.48 (0.2)*	-0.09 (0.1)
Model 3: Georgia Pre-K*Working Poor (se)	-0.60 (2.4)	0.90 (1.6)	2.22 (1.1)*	0.62 (0.6)
Model 4: Georgia Pre-K*African-Amer (se)	1.08 (2.3)	-0.89 (1.7)	1.69 (1.4)	0.46 (0.7)
Georgia Pre-K*Other race (se)	2.21 (3.0)	0.78 (1.9)	0.41 (1.8)	0.73 (0.9)

Note: Child and family characteristics and type of preschool program were included in these models as control variables.

*p≤0.05.

Although the effects of attending Pre-K on other skills, such as math fluency, expressive vocabulary and problem-solving were generally positive for these same groups of children, these effects were not significant (Table 5.2). Because the added benefits from attending Pre-K for other skills measured at the end of first grade were not statistically significant, we will focus on the analysis of the four skills that were measured from the beginning of preschool through the end of first grade.

TABLE 5.2. EFFECTS OF GEORGIA PRE-K ON RELATIONS BETWEEN CHILD CHARACTERISTICS AND RATES OF GROWTH FROM PRESCHOOL THROUGH FIRST GRADE*

	WJ- Calculation	WJ – Math Fluency	CTOPP- Elision
Model 1: Georgia Pre-K*TANF (se)	0.67 (0.5)	0.42 (2.0)	0.39 (0.8)
Model 2: Georgia Pre-K*Income (se)	-0.05 (0.1)	-0.22 (0.4)	-0.13 (0.2)
Model 3: Georgia Pre-K*Working Poor (se)	0.30 (0.5)	1.50 (2.0)	0.90 (0.7)
Model 4: Georgia Pre-K*African-Amer(se)	0.38 (0.5)	1.45 (2.6)	-0.13 (0.7)
Georgia Pre-K*Other minorities (se)	0.33 (0.7)	-0.52 (3.4)	0.80 (1.1)

Note: Child and family characteristics and type of preschool program were included in these models as control variables

*p≤0.05. **p≤0.01. ***p≤0.001.

The Differential Effects of Georgia’s Pre-K Program on Children from High Poverty and Minority Families

One goal of the Georgia Early Childhood Study was to determine whether Georgia’s Pre-K Program had any effects on children who may have been at-risk of school failure and to establish whether these children received benefits that were greater than or less than those of other children. Positive effects on these groups indicate that they profited from their participation in the Pre-K Program over and above the benefits received by other groups. Additionally, the study tested these effects by level of income. Our findings indicate that poor children benefited more from participation in Pre-K than children in families with middle or higher incomes.

Georgia Pre-K had a positive effect on students whose families were enrolled in the TANF program. Arguably, these are some of the poorest children in the state. After

controlling for family and child characteristics, the Pre-K program was shown to have a significant and positive effect on a child’s ability to identify letters and words (Table 5.3)

TABLE 5.3. EFFECT OF PRE-K ON TANF RECIPIENTS

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification	Applied Problem-Solving
Pre-K*TANF	2.81	-0.02	2.31*	0.39
Baseline	0.56***	0.66***	0.79***	0.46***
Age at school entry	-0.29	-0.25	1.10	0.59
Gender (Boy = 1)	2.14*	1.04	-0.66	-0.09
Other Minorities	1.14	0.13	1.15	0.95
African-American	-2.69*	-2.70*	0.06	-1.05*
Mother’s Ed. (Less than HS)	-2.62	-2.83	-1.56	-1.63**
Mother’s Ed. (Greater than HS)	1.39	0.65	0.04	-0.53
Both Parents not in the home	-2.20	0.21	-0.91	-0.41
Pre-K	-1.82	1.06	-0.38	0.15
Income	0.35	0.00	0.56	0.11
TANF	-1.99	0.02	-1.70	0.19
Working Poor	1.51	-1.29	1.18	-0.14

*p≤0.05. **p≤0.01. ***p≤0.001.

The Pre-K Program also had a positive effect on students whose families were categorized as ‘working poor,’ meaning they were eligible for means tested benefits, such as Food Stamps and Medicaid but earned too much to qualify for TANF. For this population, Pre-K significantly improved the ability of these children to recognize letters and words (Table 5.4). Except for receptive language, the effects of Pre-K were positive for these children from working poor families though the differences were insignificant.

TABLE 5.4. EFFECT OF PRE-K ON CHILDREN ELIGIBLE FOR MEANS TESTED BENEFITS

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification	Applied Problem-Solving
Pre-K*Working Poor	-0.60	0.90	2.22*	0.62
Baseline	0.56***	0.65***	0.79***	0.46***
Age at school entry	-0.33	-0.28	0.97	0.56
Gender (Boy = 1)	2.07*	1.04	-0.69	-0.10
Other Minority	1.20	0.14	1.23	0.98
African-American	-2.73*	-2.66*	0.12	-1.03*
Mother’s Ed. (Less than HS)	-2.86	-2.73	-1.48	-1.59*
Mother’s Ed. (Greater than HS)	1.47	0.67	0.13	-0.51
Both Parents not in the home	-2.24	0.22	-0.92	-0.41
Pre-K	-0.01	0.58	-0.29	0.04
Income	0.37	0.00	0.56*	0.11
TANF	-0.25	0.00	-0.28	0.43
Working Poor	1.92	-1.81	-0.09	-0.49

*p≤0.05. ***p≤0.001.

Additionally, Georgia Pre-K had varied effects on students from families of different household income levels. In their ability to identify letters and words, there was a significant, negative relationship (Table 5.5), indicating that Georgia Pre-K raised the test scores of lower income children more than their higher income peers. Only for the identification of letters and words was the effect significant. However, for the other

skills, Pre-K had a more positive effect on children from poorer families. Children from lower income families began preschool significantly behind their more affluent peers, and Pre-K contributed to the closure of the gap between lower and upper income children.

Finally, the Georgia Pre-K Program had varying effects on children when divided by race (Table 5.6). In the areas of applied problem-solving and language skills, the effect of Pre-K for minorities was generally more positive than for other children, though the differences were not significant. Factors such as income, mother's education and the children's skills assessments when entering preschool had a greater influence on skills at the end of first grade than other variables in the model.

TABLE 5.5. EFFECT OF PRE-K BY INCOME

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification	Applied Problem-Solving
Pre-K*Income	-0.11	-0.08	-0.49*	-0.09
Baseline	0.56***	0.65***	0.79***	0.46***
Age at school entry	-0.36	-0.25	1.00	0.57
Gender (Boy = 1)	2.09*	1.04	-0.66	-0.09
Other Minority	1.23	0.13	1.30	0.98
African-American	-2.70*	-2.69*	0.16	-1.04*
Mother's Ed. (Less than HS)	-2.73	-2.79	-1.44	-1.61*
Mother's Ed. (Greater than HS)	1.47	0.65	0.09	-0.52
Both Parents not in the home	-2.23	0.21	-0.88	-0.41
Pre-K	0.16	1.41	3.03*	0.78
Income	0.43	0.05	0.86*	0.17
TANF	-0.24	0.01	-0.25	0.43
Working Poor	1.55	-1.30	1.23	-0.13

*p≤0.05. ***p≤0.001.

TABLE 5.6. EFFECTS OF PRE-K BY RACE

	Receptive Vocabulary	Expressive Vocabulary	Letter-Word Identification	Applied Problem-Solving
Prek*African-American	1.08	-0.89	1.69	0.46
Prek*Minorities	2.21	0.78	0.41	0.73
Baseline	0.56***	0.65***	0.80***	0.46***
Age at school entry	-0.28	-0.25	1.09	0.60
Gender (Boy = 1)	2.09*	1.04	-0.65	-0.09
Other Minority	-0.01	-0.24	0.92	0.57
African-American	-3.36	-2.19	-0.96	-1.32*
Mother's Ed. (Less than HS)	-2.78	-2.88	-1.65	-1.65**
Mother's Ed. (Greater than HS)	1.47	0.67	0.07	-0.52
Both Parents not in the home	-2.23	0.20	-0.92	-0.41
Pre-K	-1.00	1.31	0.14	0.09
Income	0.36	0.00	0.57*	0.11
TANF	-0.26	0.00	-0.27	0.42
Working Poor	1.55	-1.33	1.28	-0.12

*p≤0.05. **p≤0.01. ***p≤0.001.

Conclusion

Children in the study who were at-risk of school failure received benefits from attending Georgia Pre-K that were over and above those received by children who were not at-risk and greater than those attending Head Start or private preschool. This was true for very low income children, such as those receiving TANF, and children of the working poor who were less likely to be eligible for other programs targeted at children in high-poverty families. The benefits over and above those received by other children attending Pre-K were significant only for identification of letters and words but were generally positive direction for all skills tested.

These results provide an additional motivation for extensive collaboration or partnerships with agencies that deliver more targeted services. This collaboration could produce better outcomes for children. For example, Head Start, which has demonstrated effectiveness in providing developmental services for younger children, could concentrate on providing comprehensive services for two- to three-year-olds. Then, when these children turn four years old, they could be transitioned into universal preschool classes, while continuing some auxiliary or supplemental services if needed. This type of partnership could expand developmentally oriented services available to children from economically disadvantaged households.



The Georgia Early Childhood Study

Chapter 6

Conclusions

While students' math and reading skills are on the rise in the state, Georgia's students continue to trail their peers in other states. In both reading and math skills, only 27% of Georgia's fourth graders were considered proficient, according to the National Assessment of Educational Progress conducted in 2003. Children from 30 states scored higher than Georgia's fourth graders on reading and math skills assessments. Georgia's students, on average, only posted higher scores than children from a handful of states, leaving Georgia in the bottom third of the states from the standpoint of educational skill development in the early elementary years.

Children of preschool age in Georgia in this study gained skills more rapidly during their first years of formal education than would be expected based on national norms. The gains by children in this study attending Pre-K were large and significant, even after taking the normal development for children their age into account. On applied problem-solving skills and expressive language, Georgia's preschoolers in this study posted steady gains relative to national norms each year. In expressive language assessments, the scores of children who attended Georgia Pre-K equaled the national norms; however, on receptive language and recognition of letters and words, the average scores for Georgia's first graders in this study fell, relative to the national norms.

The drop-off of skills relative to national norms for letter-word identification and receptive language is troublesome. It may be a leading indicator of the relatively low levels of proficiency that have been observed among Georgia's fourth graders in the National Assessment of Education Progress.

These declines are somewhat paradoxical given that the children from economically disadvantaged families, who were classified as non-resilient, made the greatest gains during their first grade year relative to their resilient peers. To be sure, the non-resilient children still significantly trailed the resilient children in skill development, but they were closing the gap somewhat by the end of first grade.

The paradox may be explained by the language skills being taught in first grade. If basic skills are being taught rather than higher-order language skills, the result could be increasing gains for the children who lack basic skills. However, this concentration on

basic skills could also result in a lapse in language skill development for first graders who have mastered the basics and are not being taught the higher-order skills that their peers around the country are learning. The current study can neither prove nor disprove this explanation, but a further investigation of the teaching of language skills in the first grade could shed light on its accuracy.

In the meantime, it is prudent to ask how teachers and schools can organize themselves to ensure that the children who are behind in developing language skills can make gains *and* children who are at or above grade level expectations can develop higher-order language skills. This may require solutions that begin to breakdown the traditional assignment of children to a single teacher in elementary schools. Promising approaches include pre-testing all children within a grade level at the beginning of an instructional unit and regrouping them according to their scores. This approach allows each child to receive instruction at the highest level they are prepared to handle. Children may have more than one teacher in a day and be grouped with different students at different times. Certainly, it will be challenging to find ways to maintain the rapid development of children with highly developed language skills and close the gap for children who have lagged behind simultaneously.

The findings from this study lead to the development of conclusions around two central themes, families and the benefits of universal preschool programs. Families and the children's home environments account for the greatest differences in children's skills. Overcoming the effects of poverty on children may require public programs, including preschool and working directly with families in poverty. However, the effects for children in poverty may be better achieved through universal preschool programs than targeted programs.

Parents who have completed less formal education and families that are less stable provide environments in which children tend to fall behind their peers in terms of their skills and abilities. However, these differences are not inescapable, as the resilient children, discussed in Chapter 3, demonstrate. Parents who spend time with their children and interact with them with a strong sense of purpose can have positive effects. Parents who know when to guide and when to be a friend to their children can instill resiliency that allows the children to overcome adverse circumstances. Rejecting fatalism is also an important attribute for engendering resiliency. However, these parental qualities can be difficult to muster when families are buffeted by dire economic issues. Moreover, it is difficult to identify a program or government intervention that could help directly instill these deeply seated values and the convictions needed to act upon them.

One difference between parents of resilient and non-resilient children was the extent to which they worked with their children's teachers and other school personnel. Perhaps, programs, such as the Resource Coordinator program, which is administered by Bright from the Start: Georgia Department of Early Care and Learning, could identify methods that develop these skills in parents while their children attend Pre-K. In addition, more work in achieving successful transitions for the Pre-K children *and* their parents into kindergarten may lay the groundwork for more successful parent-school partnerships. Despite programs proven to enhance children's development and success in school, some

in the public continue to doubt that public pre-kindergarten programs should be universally available.

Two rationales are often offered for universal pre-kindergarten. The first is associated with program quality. This argument states that to enroll children from middle class and more affluent families, program quality will need to be high. The subsequent high quality program would benefit all children in the state. A corollary to this argument suggests that parents may not choose to enroll their children in a high quality preschool, even if they can afford it. The corollary, if true, means that children from families that are economically better off would also benefit from high quality preschool. In this study, we found that the Georgia Pre-K program does produce higher levels of skills among children of very poor and working poor families. Children from families that received Temporary Assistance for Needy Families (TANF) and children from working poor families were able to identify more letters and words at the end of first grade if they attended the Georgia Pre-K program. Furthermore, attending the Georgia Pre-K program appeared to help children from lower income families close the gap between themselves and their more advantaged peers in letter and word identification. However, more support for economically disadvantaged children may be needed.

Given that the children who did not appear to be resilient began to close the gap with their peers during the first grade, it may be important to begin providing preschool services earlier for these children. Identifying these children and enrolling them in developmentally oriented programs as three-year-olds may provide needed resources at an age that would allow them to begin to close the gap sooner.

The second rationale for universal pre-kindergarten is that children learn a great deal from their peers in their preschool classes. Children, according to this argument, will develop more rapidly in classes where they have peers with more skills. Programs targeted only at disadvantaged children are likely to include fewer children with high skill levels in preschool classes. Therefore, these programs are unlikely to have significant peer effects.

Research focused on the extent to which peers affect development in early education classes is in its initial stages. The results from this study are promising and support this second rationale for universal pre-kindergarten programs. In an analysis of the effects of the skills of peers in the classroom, we found that children in classes with higher ability levels post higher gains during kindergarten (Table 6.1). These effects were significant and positive when controlling for the children's characteristics, family characteristics, other preschool resources (e.g. teacher's qualifications and program quality), and the children's own skills upon entry to preschool. Therefore, achieving a mix of children in Pre-K classrooms may be important for skill development, which the universal nature of the program allows.

While the findings relating peer ability to skill acquisition are preliminary, they support the belief that universal programs can promote greater skill attainment than programs targeted only to poor children. These findings about peer abilities may provide yet another reason that programs for three-year-olds, whose skills may be under-developed for their age, could be important. If skills for these children can be developed more

quickly as three-year-olds, the average skill level for four-year-olds in Georgia Pre-K or Head Start could be increased. These initial increases may stimulate greater skill acquisition on the part of four-year-olds in preschool classes. However, these findings cast doubt on the placement of three- and four-year-olds in the same classroom. Mixed-age grouping might explain why children in Head Start develop skills more rapidly as three-year-olds than as four-year-olds. As three-year-olds, they have more skilled four-year-old children in their classrooms. As a result, they gain more skills as three-year olds than they will as four-year-olds, when many of the children in the classroom have lower skill levels.

TABLE 6.1. EFFECTS OF PEER SKILLS ON PRE-READING AND PRE-MATH SKILLS

-----Children's Skills During Kindergarten-----					
	Receptive -----Language-----		Applied Problem- -----Solving-----		Print Familiarity and Understanding
	Fall	Spring	Fall	Spring	Fall
Peer Effects					
Class ability score	4.90**	0.71	5.64**	3.84**	0.98**
Class Composition					
Percent of boys	0.74	2.29	-1.16	-25.25^^	-0.73
Percent of African-American students	9.19^	0.46	-1.74	7.82^^	0.08
Percent of Hispanic students	7.34	-3.94	-4.67	-1.13	2.36
School Resources					
Total number of students	0.52^^	0.14	0.09	0.17	0.02
Teacher experience (yrs teaching)	0.14	0.01	-0.10	-0.15	-0.01
Teacher has a bachelor's degree	-1.33	0.18	-1.47	-5.06^^	0.18
ECERS-R rating	2.03	0.03	-1.99^	-1.19	-0.08
Time teacher spends on discipline	0.40	-0.49	-0.14	0.44	0.06
Program Type					
Head Start	-1.76	3.56	4.15	-2.63	0.03
Private	1.56	1.16	-3.46	-2.60	0.33
Child Individual Characteristics					
Pre-reading skill (Baseline score)	0.53^^	0.60^^	0.56^^	0.49^^	-0.00^^
Sex (Male = 1)	3.76^^	3.07^^	-2.10	1.70	-1.03^^
Race (African-American = 1)	-5.72^^	-2.34	-3.39	-6.64^^	-0.56
Race (Other = 1)	-2.43	-0.23	0.45	2.38	0.04
Family Characteristics					
Income	0.04	-0.01	0.24	0.66^	0.15
TANF	-3.33	-0.96	1.07	0.47	-0.10
Lived continuously with both parents	-1.18	1.32	0.65	2.17	0.03
Mother's ed. (High School = 1)	2.39	-0.20	0.13	-0.01	-0.44
Mother's ed. (Less than HS = 1)	0.50	-2.49	1.26	4.10	-0.81
Constant	24.97	40.94	56.23	69.44	7.70
R ²	0.62	0.65	0.62	0.56	0.29

**1-tailed significance level at the 0.01 level.

^ 2-tailed significance level at the 0.05 level.

^^ 2-tailed significance level at the 0.01 level.

The availability of Georgia's universal pre-kindergarten program provides parents with more choices. Its availability seems to have resulted in parents placing their four-year-olds in environments where they gain skills faster than expected by the national norm. Some children will need more support to attain the skill level of their peers, and schools must adjust to maintain the positive trajectories of these children and to keep them on the path toward proficiency in reading, math, writing, science, and social studies.

References

- Abbott-Shim, M., & Sibley, A. (1998). *Assessment profile for early childhood programs - research edition II*. Atlanta, GA: Quality Assist.
- Arnett, J. (1989). Caregivers in day-care centers: Does training really matter? *Journal of Applied Developmental Psychology, 10*, 541-52.
- Baker, L. D., Scher, D., & Mackler, K. (1997). Home and family influences on motivations for reading. *Educational Psychologist, 32*(2), 69-82.
- Barnett, W. S., Hustedt, J. T., Robin, K. B., & Schulman, K. L. (2004). *The state of preschool: 2004 state preschool yearbook*. New Brunswick, NJ: NIEER.
- Bryant, D. (2001). *Number naming subtest*. Chapel Hill, NC: University of North Carolina, National Center for Early Development and Learning, Frank Porter Graham Child Development Center.
- Burchinal, M., Roberts, J., Riggins, R., Zeisel, S., Neebe, E., & Bryant, D. (2000). Relating quality of center-based child care to early cognitive and language development longitudinally. *Child Development, 71*(1), 339-57.
- Carrow-Woolfolk, E. (1995). *Oral and written language scales*. Circle Pines, MN: American Guidance Service.
- Conger, R. D., & Conger, K. J. (2002). Resilience in Midwestern families: Selected findings from the first decade of a prospective, longitudinal study. *Journal of Marriage and Family, 64*(2), 361-373.
- Congressional Research Service. (2003). *Head Start: Background and funding* (RL30952). Washington, DC: CRS.
- Coolahan, K., McWayne, C. M., Fantuzzo, J. W., & Grim, S. M. (2002). Validation of multidimensional assessment of parenting styles for low-income African-American families with preschool children. *Early Childhood Research Quarterly, 17*(6), 356-73.
- Department of Early Care and Learning (Georgia, Bright From the Start) (2005). *Pre-K guidelines & appendix*. Department of Early Care and Learning Web Site: <http://www.decal.state.ga.us/PreK/PreKGuidelines.html> [2005]
- Dunn, L. M., & Dunn, L. M. (1997). *Peabody picture vocabulary test- third edition*. Circle Pines, MN: American Guidance Service.
- Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist, 59*(2), 77-92.

- Georgia Head Start Collaboration Office. (2003). *Georgia Head Start facts and figures*. Office of School Readiness Web Site: www.osr.state.ga.us/headstart1.html [2003]
- Georgia Office of Educational Accountability. (2002). *Report card*. The Georgia Office of School Readiness Web Site: www.reportcard.gaosa.org/yr2003/osr/ [2003] .
- Harms, T., Clifford, R. M., & Cryer, D. (1998). *Early childhood environment scale-revised edition*. New York, NY: Teacher College Press.
- Hemmeter, M. L., Maxwell, K. L., Ault, M. J., & Schuster, J. W. (2001). *Assessment of practices in early elementary education*. New York, NY: Teachers College Press.
- Henry, G. T., Gordon, C. S., Henderson, L. W., & Ponder, B. D. (2003). *Georgia Pre-K longitudinal study, final report 1996-2001* . Atlanta, GA: Georgia State University, Andrew Young School of Policy Studies.
- Kagan, S. L., Moore, E., & Bradenkamp, S. (1995). *National education goals panel of school readiness*. National Educational Goals Panel [2003].
- Kid's Count (2003). *Kids count 2003 data book*. Baltimore, MD: The Annie E. Casey Foundation.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543-62.
- Mashburn, A., and Henry G.T. (2004). *Children's attitude towards school (CATS)*. Developed for the Georgia Early Childhood Study. Atlanta, GA: Georgia State University, Andrew Young School of Policy Studies
- McCubbin, H. I., & McCubbin, M. A. (1988). Typologies of resilient families: Emerging roles of social class and ethnicity. *Family Relations, 37*, 247-54.
- National Early Childhood Longitudinal Study (1999). *Fall parent interview guide*. Washington, DC: National Center for Educational Statistics.
- Rosier, K. B. (2000). *Mothering inner-city children: The early school years*. New Brunswick, NJ: Rutgers University Press.
- Sameroff, A., R., S., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores for 4-year old children: Social environmental risk factors. *Pediatrics, 79*, 343-50.
- Secombe, K. (2002). 'Beating the odds' versus 'changing the odds': Poverty, resilience, and family policy. *Journal of Marriage and Family, 62(2)*, 384-95.

- US Department of Health and Human Services. (2002). *Head Start: A descriptive study of Head Start families: FACES technical report I*. US Administration for Children, Youth, and Families - Head Start Bureau Web site: www.acf.dhhs.gov/programs/core/ongoing_research/faces/technical_report [2003].
- Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1999). *Comprehensive test of phonological processes*. Austin, TX: PRO-ED.
- Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III tests of achievement*. Ithaca, IL: Riverside Publishing.
- Zill, N., & Resnick, G. (1998). *Head Start family and child experiences survey*. Rockville, MD: Westat.

**APPENDIX A:
LANGUAGE DEVELOPMENT: RAW SCORES BY CHILD AND FAMILY CHARACTERISTICS**

Income	\$0-39,999	6.3 (3.7)	9.8 (4.4)	13.2 (4.7)	22.3 (6.8)	33.8 (7.9)	+27.5
	\$40,000-79,999	9.2 (5.1)	12.9 (5.8)	17.6 (6.5)	27.2 (7.6)	39.3 (7.0)	+30.1
	\$80,000+	7.5 (4.7)	12.4 (7.7)	17.5 (9.9)	26.0 (8.7)	39.9 (9.3)	+32.4
Living with Both Parents Since Birth	Yes	8.3 (5.0) ^k	12.2 (5.7) ^k	16.6 (6.5) ^l	26.4 (7.5) ^l	38.9 (7.0) ^l	+30.6
	No	6.4 (4.0) ^k	10.1 (4.4) ^k	13.7 (5.4) ^l	22.7 (7.2) ^l	34.5 (8.6) ^l	+28.1
Mother's Education	Less than HS	4.4 (2.3)	7.8 (4.3)	10.9 (4.8)	18.9 (5.3)	31.1 (7.5)	+26.7
	HS diploma	6.7 (4.5)	10.4 (5.1)	14.6 (5.3)	24.0 (6.7)	35.4 (7.3)	+28.7
	Greater than HS	8.8 (4.5)	12.4 (5.4)	16.9 (6.5)	26.5 (7.9)	38.8 (7.6)	+30.0
Overall	3 group sample	7.3 (4.5)	10.8 (5.3)	15.1 (6.0)	24.3 (7.5)	36.5 (7.8)	+29.2
	4 group sample	N/A	N/A	15.2 (6.2)	24.7 (7.6)	36.9 (7.9)	+21.7
OWLS							
Entry Age	4	22.5 (8.3) ^a	30.0 (9.3) ^b	N/A	40.7 (9.8)	48.8 (10.1)	+26.3
	5	25.4 (9.1) ^a	32.3 (9.1) ^b	N/A	41.0 (10.3)	49.8 (9.6)	+24.4
Gender	Male	22.6 (8.3) ^c	30.2 (9.3) ^c	N/A	41.0 (10.3)	48.6 (10.1)	+26.0
	Female	25.7 (9.2) ^c	32.3 (9.1) ^c	N/A	42.3 (9.7)	49.3 (9.7)	+23.6
Race	White	26.8 (8.6)	34.2 (8.9)	N/A	44.2 (9.2)	52.3 (9.1) ^e	+25.5
	African-American	20.3 (8.0)	27.1 (8.0) ^h	N/A	36.0 (9.0) ^g	44.2 (9.2) ^e	+23.9
	Other	22.6 (8.5)	29.3 (9.3)	N/A	40.9 (10.6)	47.1 (9.3) ^e	+24.5
Working Poor	Yes	21.4 (8.4) ^r	28.0 (8.5) ^r	N/A	36.6 (9.2) ^r	46.4 (10.2) ^r	+25.0
	No	27.0 (8.8) ^r	34.0 (9.4) ^r	N/A	45.1 (9.2) ^r	54.2 (8.4) ^r	+27.2
TANF	Received	18.5 (7.6) ⁱ	25.7 (8.5) ⁱ	N/A	35.5 (10.7)	46.4 (9.1) ⁱ	+27.9
	Did not receive	24.7 (8.8) ⁱ	31.7 (9.2) ⁱ	N/A	42.2 (9.8)	52.9 (9.4) ⁱ	+28.2
Income	\$0-39,999	21.1 (8.1)	28.0 (8.4)	N/A	36.5 (9.3)	46.2 (9.7)	+25.1
	\$40,000-79,999	26.9 (8.5)	34.2 (9.2)	N/A	44.4 (9.6)	53.1 (9.2)	+26.2
	\$80,000+	27.5 (12.9)	31.9 (13.8)	N/A	40.8 (12.5)	52.4 (10.9)	+24.9
Living with Both Parents Since Birth	Yes	25.5 (8.9)	32.5 (9.3) ^k	N/A	43.0 (9.8)	51.5 (9.6) ^k	+26.0
	No	21.4 (8.2)	28.4 (8.5) ^k	N/A	38.2 (9.6)	46.5 (9.9) ^k	+25.1
Mother's Education	Less than HS	16.7 (6.7)	23.0 (6.2)	N/A	32.8 (6.6)	41.0 (7.8)	+24.3
	HS diploma	23.0 (8.1)	29.7 (8.7)	N/A	39.0 (9.5)	48.6 (9.7)	+25.6
	Greater than HS	26.4 (8.8)	33.4 (9.3)	N/A	43.4 (10.1)	52.7 (9.3)	+26.3
Overall	3 group sample	23.3 (8.8)	30.2 (9.3)	N/A	40.1 (9.9)	49.3 (9.8)	+26.0
	4 group sample	N/A	N/A	N/A	40.6 (10.0)	50.1 (10.0)	+9.5
CTOPP-Elision							
Entry Age	4	N/A	N/A	3.0 (2.6)	5.9 (3.5)	9.7 (4.8)	+6.7
	5	N/A	N/A	3.5 (3.1)	6.2 (3.9)	9.5 (4.6)	+6.0

Gender	Male	N/A	N/A	3.1 (2.9)	5.8 (3.8)	9.6 (4.7)	+6.5
	Female	N/A	N/A	3.4 (2.8)	6.3 (3.6)	9.7 (4.8)	+6.3
Race	White	N/A	N/A	3.7 (2.9)	7.0 (3.7)	10.7 (4.9) ^e	+7.0
	African-American	N/A	N/A	2.1 (2.5) ^g	4.1 (2.9) ^h	7.3 (3.5) ^e	+5.2
	Other	N/A	N/A	3.2 (2.9)	5.6 (3.6)	9.4 (4.4) ^e	+6.2
Working Poor	Yes	N/A	N/A	2.2 (2.3) ^r	4.7 (3.3) ^r	8.2 (4.5) ^r	+6.0
	No	N/A	N/A	4.1 (3.1) ^r	6.9 (3.8) ^r	10.7 (4.7) ^r	+6.6
TANF	Received	N/A	N/A	2.0 (2.5)	4.3 (3.3) ⁱ	7.0 (3.5) ⁱ	+5.0
	Did not receive	N/A	N/A	3.3 (2.9)	6.2 (3.7) ⁱ	9.9 (4.7) ⁱ	+6.6
Income	\$0-39,999	N/A	N/A	2.0 (2.2)	4.6 (3.4)	8.1 (4.4)	+6.1
	\$40,000-79,999	N/A	N/A	3.8 (2.9)	6.6 (3.6)	10.3 (4.7)	+6.5
	\$80,000+	N/A	N/A	3.3 (3.0)	6.9 (5.0)	10.0 (4.2)	+6.7
Living with Both Parents Since Birth	Yes	N/A	N/A	3.6 (3.0)	4.9 (3.4) ^k	10.3 (4.7) ^l	+6.7
	No	N/A	N/A	2.3 (2.4)	6.5 (3.8) ^k	7.9 (4.2) ^l	+5.6
Mother's Education	Less than HS	N/A	N/A	1.1 (1.5)	2.9 (3.0)	6.8 (3.6)	+5.7
	HS diploma	N/A	N/A	2.5 (2.4)	5.4 (3.5)	8.5 (4.4)	+6.0
	Greater than HS	N/A	N/A	3.7 (2.9)	6.4 (3.7)	10.3 (4.7)	+6.6
Overall	3 group sample	N/A	N/A	2.7 (2.7)	5.4 (3.7)	8.9 (4.5)	+6.2
	4 group sample	N/A	N/A	3.0 (2.8)	5.7 (3.7)	10.6 (2.9)	+7.6
CTOPP-Sound Matching							
Entry Age	4	N/A	N/A	7.4 (5.3)	12.6 (5.4)	N/A	+5.2
	5	N/A	N/A	8.0 (5.6)	13.1 (5.5)	N/A	+5.1
Gender	Male	N/A	N/A	7.2 (5.0) ^c	12.5 (5.4)	N/A	+5.3
	Female	N/A	N/A	8.3 (5.9) ^c	13.2 (5.5)	N/A	+4.9
Race	White	N/A	N/A	8.4 (5.4)	13.5 (5.3)	N/A	+5.1
	African-American	N/A	N/A	6.2 (5.1) ^g	11.2 (5.6) ^g	N/A	+5.0
	Other	N/A	N/A	7.7 (5.8)	13.2 (5.2)	N/A	+5.5
Working Poor	Yes	N/A	N/A	5.4 (4.6) ^r	11.3 (5.5) ^r	N/A	+5.9
	No	N/A	N/A	9.5 (5.6) ^r	14.2 (5.0) ^r	N/A	+4.7
TANF	Received	N/A	N/A	5.0 (4.4) ⁱ	10.7 (5.8)	N/A	+5.7
	Did not receive	N/A	N/A	8.0 (5.5) ⁱ	13.0 (5.4)	N/A	+5.0
Income	\$0-39,999	N/A	N/A	5.6 (4.5)	11.0 (5.6)	N/A	+5.4
	\$40,000-79,999	N/A	N/A	9.0 (5.6)	13.8 (5.2)	N/A	+4.8
	\$80,000+	N/A	N/A	6.9 (4.4)	12.9 (6.3)	N/A	+6.0
Living with Both Parents Since Birth	Yes	N/A	N/A	8.5 (5.5) ^k	13.6 (5.2)	N/A	+5.1
	No	N/A	N/A	5.9 (4.9) ^k	10.9 (5.7)	N/A	+5.0
Mother's Education	Less than HS	N/A	N/A	3.9 (3.2)	9.2 (4.9)	N/A	+5.3
	HS diploma	N/A	N/A	6.2 (5.0)	11.6 (5.4)	N/A	+5.4

	Greater than HS	N/A	N/A	8.6 (5.3)	13.4 (5.3)	N/A	+4.8
Overall	3 group sample	N/A	N/A	6.8 (5.1)	12.0 (5.5)	N/A	+5.2
	4 group sample	N/A	N/A	7.2 (5.3)	12.3 (5.5)	N/A	+5.1
Skills Test: Story and Print							
Gender	Male	3.3 (2.2)	4.4 (2.5)	6.6 (2.6)	N/A	N/A	+3.3
	Female	3.9 (2.4)	5.4 (2.6)	7.2 (2.7)	N/A	N/A	+3.3
Race	White	4.2 (2.3)	5.7 (2.6)	7.6 (2.6)	N/A	N/A	+3.4
	African-American	2.8 (2.1)	3.6 (2.2)	6.0 (2.5)	N/A	N/A	+3.2
	Other	3.8 (2.8)	5.3 (2.5)	7.0 (2.8)	N/A	N/A	+3.2
Working Poor	Yes	3.4 (2.2) ^f	4.5 (2.4) ^f	6.6 (2.5) ^f	N/A	N/A	+3.2
	No	4.6 (2.6) ^f	6.0 (2.6) ^f	8.0 (2.4) ^f	N/A	N/A	+3.4
TANF	Received	3.3 (2.3)	4.3 (2.4)	6.4 (2.6)	N/A	N/A	+3.1
	Did not receive	4.3 (2.4)	5.8 (2.6)	7.8 (2.5)	N/A	N/A	+3.5
Income	\$0-39,999	3.2 (2.1)	4.5 (2.3)	6.4 (2.5)	N/A	N/A	+3.2
	\$40,000-79,999	4.5 (2.6)	6.0 (2.5)	8.1 (2.4)	N/A	N/A	+3.6
	\$80,000+	3.5 (1.9)	5.6 (3.6)	7.5 (3.0)	N/A	N/A	+4.0
Living with Both Parents Since Birth	Yes	4.2 (2.5)	5.8 (2.6)	7.7 (2.5)	N/A	N/A	+3.5
	No	3.4 (2.1)	4.3 (2.3)	6.6 (2.6)	N/A	N/A	+3.2
Mother's Education	Less than HS	2.7 (1.8)	3.6 (2.0)	5.6 (2.3)	N/A	N/A	+2.9
	HS diploma	3.7 (2.3)	4.9 (2.5)	6.9 (2.4)	N/A	N/A	+3.2
	Greater than HS	4.3 (2.4)	5.6 (2.5)	7.8 (2.6)	N/A	N/A	+3.5
Overall	3 group sample	3.7 (2.4)	4.9 (2.6)	7.1 (2.6)	N/A	N/A	+3.4
	4 group sample	N/A	N/A	7.1 (2.6)	N/A	N/A	N/A

^a Age differences are significant at 0.05 level.

^b Age differences are significant at 0.01 level.

^c Gender differences are significant at 0.05 level.

^d Gender differences are significant at 0.01 level.

^e Means for all groups differ significantly at 0.05 level.

^f Means for all groups differ significantly at 0.01 level.

^g African-Americans differ significantly from Whites and Others at 0.05 level.

^h African-Americans differ significantly from Whites and Others at 0.01 level.

ⁱ TANF differences are significant at 0.05 level.

^j TANF differences are significant at 0.01 level.

^k Living with Both Parents Since Birth differences are significant at 0.05 level.

^l Living with Both Parents Since Birth differences are significant at 0.01 level.

^m Mother's education differences are significant at 0.05 level.

ⁿ Mother's education differences are significant at 0.01 level.

^o Whites and African-Americans differ significantly at 0.05 level.

^p African-Americans and Others differ significantly at 0.01 level.

^q African-Americans and Others differ significantly at 0.05 level.

^r Working Poor differences are significant at 0.01 level.

APPENDIX B
LANGUAGE DEVELOPMENT: STANDARDIZED SCORES BY CHILD AND FAMILY
CHARACTERISTICS

Living with Both Parents Since Birth	Yes	106.2 (16.2) ^l	107.1(13.2)	103.0(12.2) ^l	116.5(12.1) ^l	114.6(10.9) ^l	+8.4
	No	99.3 (13.9) ^l	102.0(11.8)	109.1(12.7) ^l	110.4(13.0) ^l	108.4(13.6) ^l	+9.1
Mother's Education	Less than HS	92.2 (10.2)	94.8 (12.1)	96.0 (11.4)	102.7 (9.6)	102.5 (12.5)	+10.3
	HS diploma	100.3 (14.7)	102.5(12.4)	105.1 (11.2)	112.3 (12.4)	109.6 (11.8)	+9.3
	Greater than HS	108.1 (14.9)	108.1 (13.0)	109.7 (12.1)	116.5 (12.1)	114.5 (11.4)	+6.4
Overall	3 group sample	102.7 (15.4)	103.8(13.3)	106.0(12.3)	112.7 (12.7)	111.1 (12.2)	+11.1
	4 group sample	N/A	N/A	107.0(13.8)	115.1 (12.9)	113.8 (12.1)	+5.1
Standardized Test: OWLS							
Gender	Male	89.9 (13.1) ^c	94.0 (14.2) ^d	N/A	98.0 (15.5)	98.5 (14.4)	+8.6
	Female	94.4 (13.9) ^c	97.1 (13.8) ^d	N/A	99.9 (14.4)	98.0 (15.2)	+3.6
Race	White	96.4 (13.0)	100.2(13.8)	N/A	103.0(14.3)	103.7 (14.0) ^e	+7.3
	African-American	85.9 (12.2)	88.9 (11.4) ^h	N/A	90.1 (12.3) ^h	91.0 (12.7) ^e	+5.1
	Other	89.6 (13.0)	92.3 (13.8)	N/A	97.4 (15.7)	94.6 (13.8) ^e	+5.0
Means Tested	Received	87.4 (12.7) ^r	90.3 (12.9) ^r	N/A	90.9 (12.8) ^r	94.4 (14.5) ^r	+7.0
	Did not receive	96.7 (13.1) ^r	100.1 (14.2) ^r	N/A	104.2 (14.1) ^r	106.4 (13.3) ^r	+9.7
TANF	Received	83.8 (11.7)	87.0 (12.0) ⁱ	N/A	90.1 (14.9)	94.0 (12.9) ⁱ	+10.2
	Did not receive	92.9 (13.5)	96.3 (14.0) ⁱ	N/A	99.7 (14.8)	104.5(14.4) ⁱ	+11.6
Income	\$0-39,999	86.9 (11.9)	89.9 (12.1)	N/A	90.5 (12.5)	93.8 (13.3)	+6.9
	\$40,000-79,999	96.7 (12.8)	100.5 (14.0)	N/A	103.2 (14.9)	104.7 (14.3)	+8.0
	\$80,000+	98.6 (19.4)	98.5 (21.5)	N/A	99.8 (18.2)	105.2 (15.9)	+6.6
Living with Both Parents Since Birth	Yes	94.3 (13.6)	97.6 (14.2) ^k	N/A	101.1(14.9)	102.1(14.8) ^k	+7.8
	No	87.5 (12.5)	90.9 (12.6) ^k	N/A	93.5 (13.8)	94.6 (13.9) ^k	+7.1
Mother's Education	Less than HS	80.0 (10.6)	82.7 (9.1)	N/A	85.0 (9.9)	86.1 (10.1)	+6.1
	HS diploma	90.2 (12.2)	93.2 (13.3)	N/A	94.8 (13.8)	97.6 (14.0)	+7.4
	Greater than HS	95.6 (13.3)	99.0 (14.2)	N/A	101.7 (15.2)	104.0 (14.2)	+8.4
Overall	3 group sample	90.7 (13.4)	94.1 (14.1)	N/A	96.4 (14.8)	98.8 (14.7)	+8.1
	4 group sample	N/A	N/A	N/A	97.5 (15.0)	100.2(15.0)	+2.7
Standardized Test: CTOPP-Elision							
Gender	Male	N/A	N/A	9.2 (2.5)	10.3 (2.8)	10.8 (3.0)	+1.6
	Female	N/A	N/A	9.4 (2.5)	10.7 (2.7)	11.0 (3.0)	+1.6
Race	White	N/A	N/A	9.8 (2.4)	11.2 (2.5)	11.5 (3.1) ^e	+1.7
	African-American	N/A	N/A	8.2 (2.3) ^g	8.9 (2.5) ^h	9.4 (2.3) ^e	+1.2
	\$80,000+	105.5 (17.4)	108.4 (20.2)	112.3 (18.7)	117.4 (14.0)	117.8 (13.7)	+12.3

	Other	N/A	N/A	9.2 (2.6)	10.1 (2.6)	10.8 (2.7) ^e	+1.6
Working Poor	Yes	N/A	N/A	8.3 (2.2) ^f	9.4 (2.7) ^r	9.9 (2.9) ^r	+1.6
	No	N/A	N/A	10.1 (2.5) ^r	11.1 (2.6) ^r	11.6 (3.0) ^r	+1.5
TANF	Received	N/A	N/A	8.2 (2.3)	9.0 (2.8)	9.3 (2.4) ⁱ	+1.1
	Did not receive	N/A	N/A	9.4 (2.5)	10.6 (2.7)	11.0 (3.0) ⁱ	+1.6
Income	\$0-39,999	N/A	N/A	8.1 (2.0)	9.3 (2.7)	9.8 (2.9)	+1.7
	\$40,000-79,999	N/A	N/A	9.8 (2.5)	10.9 (2.6)	11.3 (2.9)	+1.5
	\$80,000+	N/A	N/A	9.6 (2.8)	11.3 (3.3)	11.2 (2.7)	+1.6
Living with Both Parents Since Birth	Yes	N/A	N/A	8.4 (2.2) ^k	10.8 (2.7)	11.3 (3.0) ^k	+2.9
	No	N/A	N/A	9.6 (2.5) ^k	9.6 (2.7)	9.8 (2.8) ^k	+0.2
Mother's Education	Less than HS	N/A	N/A	7.3 (1.6)	7.7 (2.6)	8.9 (2.6)	+1.6
	HS diploma	N/A	N/A	8.6 (2.2)	10.0 (2.6)	10.1 (2.8)	+1.5
	Greater than HS	N/A	N/A	9.7 (2.5)	10.8 (2.6)	11.3 (2.9)	+1.6
Overall	3 group sample	N/A	N/A	8.9 (2.4)	10.0 (2.8)	10.4 (2.9)	+1.5
	4 group sample	N/A	N/A	9.1 (2.5)	10.2 (2.7)	10.6 (2.9)	+1.5
Standardized Test: CTOPP-Sound Matching							
Gender	Male	N/A	N/A	9.4 (2.1) ^c	10.4 (2.1)	N/A	+1.0
	Female	N/A	N/A	9.9 (2.4) ^c	10.8 (2.3)	N/A	+0.9
Race	White	N/A	N/A	9.9 (2.2)	10.9 (2.2)	N/A	+1.0
	African-American	N/A	N/A	8.9 (2.2) ^h	9.9 (2.2)	N/A	+1.0
	Other	N/A	N/A	9.6 (2.3)	10.6 (2.0)	N/A	+1.0
Working Poor	Yes	N/A	N/A	8.7 (2.1) ^r	9.9 (2.1) ^r	N/A	+1.2
	No	N/A	N/A	10.4 (2.2) ^r	11.1 (2.0) ^r	N/A	+0.7
TANF	Received	N/A	N/A	8.5 (2.0) ⁱ	9.7 (2.5)	N/A	+1.2
	Did not receive	N/A	N/A	9.7 (2.3) ⁱ	10.7 (2.2)	N/A	+1.0
Income	\$0-39,999	N/A	N/A	8.7 (1.9)	9.8 (2.2)	N/A	+1.1
	\$40,000-79,999	N/A	N/A	10.2 (2.3)	10.9 (2.1)	N/A	+0.7
	\$80,000+	N/A	N/A	9.4 (1.9)	10.9 (2.3)	N/A	+1.5
Living with Both Parents Since Birth	Yes	N/A	N/A	10.0 (2.2) ^l	10.9 (2.1)	N/A	+0.9
	No	N/A	N/A	8.8 (2.2) ^l	9.8 (2.3)	N/A	+1.0
Mother's Education	Less than HS	N/A	N/A	7.9 (1.7)	9.0 (2.1)	N/A	+1.1
	HS diploma	N/A	N/A	9.0 (2.1)	10.1 (2.1)	N/A	+1.1
	Greater than HS	N/A	N/A	10.0 (2.1)	10.8 (2.1)	N/A	+0.8
Overall	3 group sample	N/A	N/A	9.2 (2.2)	10.2 (2.2)	N/A	+1.0
	4 group sample	N/A	N/A	9.4 (2.3)	10.4 (2.2)	N/A	+1.0

- ^a Age differences are significant at 0.05 level.
- ^b Age differences are significant at 0.01 level.
- ^c Gender differences are significant at 0.05 level.
- ^d Gender differences are significant at 0.01 level.
- ^e Means for all groups differ significantly at 0.05 level.
- ^f Means for all groups differ significantly at 0.01 level.
- ^g African-Americans differ significantly from Whites and Others at 0.05 level.
- ^h African-Americans differ significantly from Whites and Others at 0.01 level.
- ⁱ TANF differences are significant at 0.05 level.
- ^j TANF differences are significant at 0.01 level.
- ^k Living with Both Parents Since Birth differences are significant at 0.05 level.
- ^l Living with Both Parents Since Birth differences are significant at 0.01 level.
- ^m Mother's education differences are significant at 0.05 level.
- ⁿ Mother's education differences are significant at 0.01 level.
- ^o Whites and African-Americans differ significantly at 0.05 level.
- ^p African-Americans and Others differ significantly at 0.01 level.
- ^q African-Americans and Others differ significantly at 0.05 level.
- ^r Working poor differences are significant at 0.01 level.

APPENDIX C
COGNITIVE AND GENERAL KNOWLEDGE RAW SCORES BY CHILD AND FAMILY
CHARACTERISTICS

Tests	Characteristic	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Spring 2004	Overall Change
WJ-Applied Problems							
Entry Age	4	10.4 (4.1) ^a	13.7 (4.1) ^b	17.1 (4.2)	21.1 (4.0)	26.4 (4.1)	+16.0
	5	11.7 (4.3) ^a	15.2 (4.3) ^b	17.9 (4.3)	21.9 (4.1)	27.0 (3.6)	+15.3
Gender	Male	10.8 (4.3)	14.1 (4.4) ^c	17.2 (4.5)	21.8 (4.1)	26.6 (4.1)	+15.8
	Female	11.4 (4.2)	15.0 (4.1) ^c	17.7 (4.2)	21.3 (4.0)	26.8 (3.7)	+15.4
Race	White	12.6 (4.0)	16.0 (3.8) ^e	18.6 (3.9)	22.6 (3.8)	27.7 (3.5)	+15.1
	African-American	9.0 (3.7) ^h	12.5 (4.0) ^e	14.9 (4.3) ^g	18.9 (3.6) ^g	24.2 (3.7) ^g	+15.2
	Other	10.3 (4.1)	13.9 (4.3) ^e	17.1 (4.4)	21.6 (4.2)	27.1 (3.3)	+16.8
Working Poor	Yes	9.7 (3.9) ^o	13.3 (4.2) ^o	15.8 (4.3) ^f	20.1 (4.1) ^o	25.0 (4.0) ^o	+15.3
	No	12.5 (4.3) ^o	15.7 (4.0) ^o	18.6 (4.2) ^f	22.6 (3.8) ^o	27.7 (3.5) ^o	+15.2
TANF	Received	8.5 (4.0) ⁱ	11.8 (4.4) ⁱ	14.5 (4.6)	19.5 (3.5) ⁱ	24.1 (4.4) ^j	+15.6
	Did not receive	11.4 (4.2) ⁱ	14.8 (4.2) ⁱ	17.7 (4.2)	21.7 (4.1) ⁱ	26.9 (3.7) ^j	+15.5
Income	\$0-39,999	9.6 (3.9)	13.1 (4.0)	15.9 (4.2)	19.9 (4.0)	24.8 (4.1)	+15.2
	\$40,000-79,999	12.5 (4.2)	15.9 (4.0)	18.5 (4.2)	22.6 (3.9)	27.4 (3.7)	+14.9
	\$80,000+	12.9 (5.3)	15.0 (5.0)	18.0 (5.0)	21.3 (4.6)	27.5 (3.8)	+14.6
Living with Both Parents Since Birth	Yes	11.8 (4.1) ^k	15.1 (4.1) ^k	18.0 (4.1)	22.0 (4.0) ^k	27.3 (3.7) ^k	+15.5
	No	9.8 (4.1) ^k	13.3 (4.4) ^k	16.1 (4.6)	20.3 (4.0) ^k	25.3 (3.9) ^k	+15.5
Mother's Education	Less than HS	8.2 (3.4) ⁿ	11.2 (3.7) ⁿ	13.8 (4.0)	18.4 (3.6) ^m	23.4 (4.1) ^m	+15.2
	HS diploma	10.5 (3.9) ⁿ	13.7 (4.2) ⁿ	16.9 (4.2)	21.3 (3.4) ^m	26.1 (3.8) ^m	+15.6
	Greater than HS	12.2 (4.1) ⁿ	15.3 (4.1) ⁿ	18.0 (4.2)	21.9 (4.4) ^m	26.9 (3.7) ^m	+14.7
Overall	No non-preschool	10.7 (4.2)	13.9 (4.3)	16.8 (4.4)	21.1 (4.0)	26.1 (3.9)	+15.4
	Including all	N/A	N/A	17.0 (4.4)	21.2 (4.0)	26.4 (3.9)	+9.4
WJ-Calculation							
Entry Age	4	N/A	N/A	N/A	4.8 (2.8)	9.6 (2.4)	+4.8
	5	N/A	N/A	N/A	5.2 (2.8)	10.2 (2.9)	+5.0
Gender	Male	N/A	N/A	N/A	4.9 (2.9)	9.9 (3.2)	+5.0
	Female	N/A	N/A	N/A	5.0 (2.8)	9.9 (2.2)	+4.9
Race	White	N/A	N/A	N/A	5.4 (2.8)	10.2 (2.8)	+4.8
	African-American	N/A	N/A	N/A	3.7 (2.7) ^g	9.0 (2.5) ^g	+5.3
	Other	N/A	N/A	N/A	5.5 (2.8)	10.2 (2.1)	+4.7
Working Poor	Yes	N/A	N/A	N/A	3.9 (2.9) ^o	9.0 (2.7) ^o	+5.1
	No	N/A	N/A	N/A	5.6 (2.7) ^o	10.5 (2.8) ^o	+4.9
TANF	Received	N/A	N/A	N/A	3.5 (2.2)	8.2 (3.0) ^j	+4.7
	Did not receive	N/A	N/A	N/A	5.1 (2.8)	10.0 (2.7) ^j	+4.9

Income	\$0-39,999	N/A	N/A	N/A	4.0 (3.1)	9.0 (2.9)	+5.0
	\$40,000-79,999	N/A	N/A	N/A	5.5 (2.8)	10.1 (2.2)	+4.6
	\$80,000+	N/A	N/A	N/A	5.3 (2.6)	10.3 (2.2)	+5.0
Living with Both Parents Since Birth	Yes	N/A	N/A	N/A	5.3 (2.8)	10.2 (2.7) ^k	+4.9
	No	N/A	N/A	N/A	4.1 (2.8)	9.2 (2.8) ^k	+5.1
Mother's Education	Less than HS	N/A	N/A	N/A	3.5 (2.3)	8.0 (3.4) ⁿ	+4.5
	HS diploma	N/A	N/A	N/A	4.7 (2.8)	9.6 (2.3) ⁿ	+4.9
	Greater than HS	N/A	N/A	N/A	5.1 (2.9)	10.2 (3.1) ⁿ	+5.1
Overall	No non-preschool	N/A	N/A	N/A	4.6 (2.8)	9.7 (2.8)	+5.1
	Including all	N/A	N/A	N/A	4.8 (2.8)	9.8 (2.7)	+5.0
WJ-Math Fluency							
Entry Age	4	N/A	N/A	N/A	9.8 (7.4) ^a	30.6 (11.9)	+20.8
	5	N/A	N/A	N/A	11.8 (8.6) ^a	33.5 (11.6)	+21.7
Gender	Male	N/A	N/A	N/A	10.4 (7.9)	32.0 (12.5)	+21.6
	Female	N/A	N/A	N/A	11.2 (8.2)	32.2 (11.2)	+21.0
Race	White	N/A	N/A	N/A	11.7 (8.2)	32.6 (11.1)	+20.9
	African-American	N/A	N/A	N/A	8.0 (6.7) ^g	29.2 (12.4) ^g	+21.2
	Other	N/A	N/A	N/A	12.2 (8.9)	35.5 (12.9)	+23.3
Working Poor	Yes	N/A	N/A	N/A	8.0 (6.8) ^o	29.3 (12.8) ^o	+21.3
	No	N/A	N/A	N/A	12.7 (8.4) ^o	34.1 (11.3) ^o	+21.4
TANF	Received	N/A	N/A	N/A	6.9 (6.6) ⁱ	26.3 (13.0)	+19.4
	Did not receive	N/A	N/A	N/A	11.2 (8.1) ⁱ	32.6 (11.6)	+21.4
Income	\$0-39,999	N/A	N/A	N/A	8.5 (7.2)	29.7 (12.8)	+21.2
	\$40,000-79,999	N/A	N/A	N/A	12.2 (8.4)	33.9 (11.7)	+21.7
	\$80,000+	N/A	N/A	N/A	15.0 (13.9)	35.7 (11.9)	+20.7
Living with Both Parents Since Birth	Yes	N/A	N/A	N/A	11.8 (8.3) ^k	33.4 (11.3)	+21.6
	No	N/A	N/A	N/A	8.4 (7.0) ^k	28.8 (12.7)	+20.4
Mother's Education	Less than HS	N/A	N/A	N/A	6.2 (5.3) ^m	25.2 (13.1)	+19.0
	HS diploma	N/A	N/A	N/A	9.8 (7.6) ^m	31.6 (12.5)	+21.8
	Greater than HS	N/A	N/A	N/A	11.6 (8.8) ^m	32.9 (11.2)	+21.3
Overall	No non-preschool	N/A	N/A	N/A	10.0 (8.0)	31.4 (12.2)	+21.4
	Including all	N/A	N/A	N/A	10.4 (8.0)	31.7 (12.1)	+21.3

^a Age differences are significant at 0.05 level.

^b Age differences are significant at 0.01 level.

^c Gender differences are significant at 0.05 level.

^d Gender differences are significant at 0.01 level.

- ^e Means for all groups differ significantly at 0.05 level.
- ^f Means for all groups differ significantly at 0.01 level.
- ^g African-Americans differ significantly from Whites and Others at 0.05 level.
- ^h African-Americans differ significantly from Whites and Others at 0.01 level.
- ⁱ TANF differences are significant at 0.05 level.
- ^j TANF differences are significant at 0.01 level.
- ^k Living with Both Parents Since Birth differences are significant at 0.05 level.
- ^l Living with Both Parents Since Birth differences are significant at 0.01 level.
- ^m Mother's education differences are significant at 0.05 level.
- ⁿ Mother's education differences are significant at 0.01 level.
- ^o Working poor differences are significant at 0.01 level.

APPENDIX D
COGNITIVE AND GENERAL KNOWLEDGE STANDARD SCORES BY CHILD AND FAMILY
CHARACTERISTICS

Characteristic	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Spring 2004	Overall Change
Living with Both Parents Since Birth	N/A	N/A	N/A	110.2 (14.8)	112.7 (16.8) ^k	+2.5
WJ-Applied Problems	N/A	N/A	N/A	106.2 (15.0)	108.2 (14.5) ^k	+2.0
Gender						
Male	97.5 (14.9) ^c	98.8 (13.9) ^c	101.4 (14.3)	108.3 (14.2)	110.7 (16.5)	+13.2
Female	99.4 (13.5) ^c	101.1 (12.5) ^c	103.2 (12.8)	108.7 (13.0)	109.7 (14.8)	+11.3
Race						
White	103.7 (13.4)	104.5 (12.0)	106.1 (12.6)	107.3 (15.5)	108.7 (12.8)	+4.4
African-American	91.0 (12.7) ^g	93.2 (12.5) ^h	94.1 (12.2) ^g	98.9 (14.5) ^g	102.6 (14.6) ^g	+11.1
Other	95.3 (12.9)	97.6 (12.7)	100.1 (13.1)	107.5 (15.9)	109.8 (16.3)	+12.3
Working Poor						
Yes	92.5 (15.4) ^o	96.0 (13.2) ^o	96.8 (12.8) ^o	102.9 (15.0) ^o	104.9 (16.6) ^o	+12.4
No	N/A	N/A	N/A	N/A	N/A	N/A
TANF						
Received	N/A	N/A	N/A	97.7 (7.8)	101.7 (13.9) ⁱ	+4.0
Did not receive	N/A	N/A	N/A	101.3 (9.1)	107.1 (13.7) ⁱ	+5.8
Income						
\$0-39,999	N/A	N/A	N/A	98.4 (7.8)	103.7 (12.5)	+5.3
\$40,000-79,999	N/A	N/A	N/A	102.4 (8.6)	108.1 (16.5)	+5.7
\$80,000+	N/A	N/A	N/A	108.8 (13.8)	112.6 (11.4)	+3.8
Living with Both Parents Since Birth						
Yes	N/A	N/A	N/A	102.2 (9.0) ^k	107.8 (13.8) ^k	+5.6
No	N/A	N/A	N/A	98.2 (8.4) ^k	103.8 (13.4) ^k	+5.6
Mother's Education						
Less than HS	N/A	N/A	N/A	94.6 (6.8)	97.6 (19.1)	+3.0
HS diploma	N/A	N/A	N/A	99.9 (8.6)	106.4 (13.1)	+6.5
Greater than HS	N/A	N/A	N/A	101.7 (9.0)	107.4 (13.7)	+5.7
Overall						
3 group sample	N/A	N/A	N/A	100.0 (9.0)	106.0 (14.2)	+6.0
4 group sample	N/A	N/A	N/A	100.7 (8.9)	106.4 (14.1)	+5.7
Poor						
No	N/A	N/A	N/A	112.2 (14.5) ^o	114.0 (15.6) ^o	+1.8
TANF						
Received	N/A	N/A	N/A	103.1 (12.2) ^j	103.3 (14.1) ⁱ	+0.2
Did not receive	N/A	N/A	N/A	110.1 (15.1) ^j	112.1 (16.3) ⁱ	+2.0
Income						
\$0-39,999	N/A	N/A	N/A	105.6 (15.2)	107.4 (21.0)	+1.8
\$40,000-79,999	N/A	N/A	N/A	111.3 (14.8)	112.0 (15.8)	+0.7
\$80,000+	N/A	N/A	N/A	111.6 (14.5)	114.5 (12.0)	+2.9

- ^a Age differences are significant at 0.05 level.
- ^b Age differences are significant at 0.01 level.
- ^c Gender differences are significant at 0.05 level.
- ^d Gender differences are significant at 0.01 level.
- ^e Means for all groups differ significantly at 0.05 level.
- ^f Means for all groups differ significantly at 0.01 level.
- ^g African-Americans differ significantly from Whites and Others at 0.05 level.
- ^h African-Americans differ significantly from Whites and Others at 0.01 level.
- ⁱ TANF differences are significant at 0.05 level.
- ^j TANF differences are significant at 0.01 level.
- ^k Living with Both Parents Since Birth differences are significant at 0.05 level.
- ^l Living with Both Parents Since Birth differences are significant at 0.01 level.
- ^m Mother's education differences are significant at 0.05 level.
- ⁿ Mother's education differences are significant at 0.01 level.
- ^o Working poor differences are significant at 0.01 level.

APPENDIX E
LANGUAGE DEVELOPMENT: RAW SCORES BY PROGRAM TYPE

Test	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Spring 2004	Overall Change
PPVT						
Georgia Pre-K	50.9 (17.1) ^a	64.6 (16.1) ^a	71.1 (11.7) ^c	84.0 (15.5) ^{c,d}	94.3 (16.0) ^{c,d}	+43.4
Head Start	39.0 (16.6) ^a	51.2 (17.3) ^a	61.3 (13.1) ^b	74.5 (13.9) ^c	83.6 (13.7) ^b	+44.6
Private	57.8 (19.0) ^a	70.2 (17.8) ^a	77.1 (18.0)	92.5 (19.4)	100.4 (15.4)	+42.6
Non-Preschool	N/A	N/A	74.8 (18.9)	88.1 (18.5)	98.7 (17.1)	+23.9
Overall - 3 group sample	50.5 (18.4)	63.2 (17.9)	71.0 (16.4)	83.7 (17.1)	93.8 (16.5)	+43.3
Overall - 4 group sample	N/A	N/A	72.3 (17.4)	85.1 (17.7)	95.3 (16.8)	+44.8
WJ-Letter Word						
Georgia Pre-K	7.3 (4.5) ^a	11.0 (5.6) ^a	15.5 (6.0)	24.8 (7.2) ^c	37.0 (7.1) ^c	+29.7
Head Start	5.3 (3.5) ^a	7.9 (4.1) ^a	11.6 (4.8) ^b	19.8 (6.3) ^b	31.2 (8.1) ^b	+25.9
Private	8.6 (4.2) ^a	12.8 (4.6) ^a	16.5 (5.4)	27.5 (7.5)	40.2 (6.4)	+31.6
Non-Preschool	N/A	N/A	15.5 (6.7)	25.4 (7.9)	37.9 (8.2)	+22.4
Overall—No non-preschool	7.3 (4.5)	10.8 (5.3)	15.1 (6.2)	24.3 (7.5)	36.5 (7.8)	+29.2
Overall	N/A	N/A	15.2 (6.2)	24.7 (7.6)	36.9 (7.9)	+29.6
OWLS						
Georgia Pre-K	23.7 (8.6) ^a	30.7 (8.7) ^a	N/A	40.7 (9.5) ^c	50.2 (9.6)	+26.5
Head Start	18.6 (7.5) ^a	24.8 (8.0) ^a	N/A	34.4 (8.7) ^b	43.1 (8.8)	+24.5
Private	26.6 (8.6) ^a	34.0 (10.0) ^a	N/A	44.0 (9.8)	53.1 (8.6)	+26.5
Non-Preschool	N/A	N/A	N/A	41.9 (10.1)	51.9 (10.0)	+10.0
Overall - 3 group sample	23.3 (8.8)	30.2 (9.3)	N/A	40.1 (9.9)	49.3 (9.8)	+26.0
Overall - 4 group sample	N/A	N/A	N/A	40.6 (10.0)	50.1 (10.0)	+26.8
CTOPP-Elision						
Georgia Pre-K	N/A	N/A	2.8 (2.7) ^d	5.6 (3.6) ^{c,d,e}	9.2 (4.4) ^c	+6.4
Head Start	N/A	N/A	1.7 (2.2) ^b	3.4 (2.8) ^b	6.6 (3.4) ^d	+4.9

Private	N/A	N/A	3.5 (2.8)	6.7 (3.7)	10.8 (4.8)	+7.3
Non-Preschool	N/A	N/A	3.5 (3.1)	6.4 (3.7)	9.7 (4.7)	+6.2
Overall - 3 group sample	N/A	N/A	2.7 (2.7)	5.4 (3.7)	8.9 (4.5)	+6.2
Overall - 4 group sample	N/A	N/A	3.0 (2.8)	5.7 (3.7)	10.6 (2.9)	+7.6
CTOPP-Sound Matching						
Georgia Pre-K	N/A	N/A	7.3 (5.1)	12.4 (5.3)	N/A	+5.1
Head Start	N/A	N/A	4.2 (3.6) ^c	8.8 (5.1) ^b	N/A	+4.6
Private	N/A	N/A	7.4 (5.6)	13.7 (5.0)	N/A	+6.3
Non-Preschool	N/A	N/A	8.1 (5.6)	13.1 (5.4)	N/A	+5.0
Overall - 3 group sample	N/A	N/A	6.8 (5.1)	12.0 (5.5)	N/A	+5.2
Overall - 4 group sample	N/A	N/A	7.2 (5.3)	12.3 (5.5)	N/A	+5.1
Skills Test: Story and Print						
Georgia Pre-K	3.9(2.4)	5.1 (2.5)	7.2 (2.4)	N/A	N/A	+3.2
Head Start	2.9(2.1)	3.5 (2.2)	5.8 (2.5)	N/A	N/A	+2.9
Private	4.0(2.4)	5.7 (2.6)	8.0 (2.7)	N/A	N/A	+4.0
Non-Preschool	N/A	N/A	7.3(2.6)	N/A	N/A	N/A
Overall - 3 group sample	3.7(2.4)	4.9 (2.6)	7.1(2.6)	N/A	N/A	+3.4
Overall - 4 group sample	N/A	N/A	7.1(2.6)	N/A	N/A	N/A

^a All groups differ significantly from each other.

^b Head Start differs from Pre-K, Private, and non-preschool.

^c Pre-K differs from Private.

^d Pre-K differs from non-preschool.

^e Pre-K differs from Head Start.

APPENDIX F
LANGUAGE DEVELOPMENT: STANDARD SCORES BY PROGRAM TYPE

CTOPP-Elision Georgia Pre-K	N/A	N/A	9.0(2.4) ^d	10.2 (2.7) ^{c,d}	10.6(2.7)	+1.6
Head Start	N/A	N/A	7.8(2.0) ^b	8.4(2.5) ^b	8.9(2.5) ^c	+1.1
Private	N/A	N/A	9.4(2.5)	10.9(2.6)	11.4(3.1)	+2.0
Non-Preschool	N/A	N/A	9.5(2.6)	10.8(2.6)	11.0(3.0)	+1.5
Overall - 3 group sample	N/A	N/A	8.9(2.4)	10.0(2.8)	10.4(2.9)	+1.5
Overall - 4 group sample	N/A	N/A	9.1(2.5)	10.2(2.7)	10.6(2.9)	+1.5
CTOPP-SM Georgia Pre-K	N/A	N/A	9.4 (2.1)	10.4 (2.1)	N/A	+1.0
Head Start	N/A	N/A	8.1 (1.7) ^b	8.9 (1.9) ^b	N/A	+0.8
Private	N/A	N/A	9.4 (2.5)	10.9 (2.1)	N/A	+1.5
Non-Preschool	N/A	N/A	9.8 (2.3)	10.8(2.2)	N/A	+1.0
Overall - 3 group sample	N/A	N/A	9.2(2.2)	10.2(2.2)	N/A	+1.0
Overall - 4 group sample	N/A	N/A	9.4(2.3)	10.4(2.2)	N/A	+1.0
Overall - 3 group sample	102.7(15.4)	103.8(13.0)	106.0(12.2)	112.7(12.7)	111.1(12.2)	+8.4
Overall - 4 group sample	N/A	N/A	106.3(12.8)	115.5(12.9)	113.8 (12.1)	+5.6
OWLS Georgia Pre-K	91.8 (13.1) ^a	94.9 (13.1) ^a	N/A	97.5 (14.2) ^c	100.1(14.4)	+8.2
Head Start	83.2 (11.5) ^a	85.8 (12.1) ^a	N/A	87.6 (11.6) ^b	89.4 (11.6)	+6.2
Private	95.3 (12.9) ^a	99.6 (15.2) ^a	N/A	101.5(15.6)	104.4(14.1)	+9.1
Non-Preschool	N/A	N/A	N/A	99.8(15.2)	103.4(15.1)	+3.6
Overall - 3 group sample	90.7 (13.4)	94.1 (14.1)	N/A	96.4(14.8)	98.8(14.7)	+8.1
Overall - 4 group sample	N/A	N/A	N/A	97.5(15.0)	100.2(15.0)	+2.7

- ^a All groups differ significantly from each other.
- ^b Head Start differs from Pre-K, Private, and non-preschool.
- ^c Pre-K differs from Private.
- ^d Pre-K differs from non-preschool.
- ^e Pre-K differs from Head Start.

APPENDIX G
COGNITIVE AND GENERAL KNOWLEDGE RAW SCORES PROGRAM TYPE

Tests	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Spring 2004	Overall Change
WJ-Applied Problems						
Georgia Pre-K	10.8 (3.9) ^a	14.0 (4.0) ^a	16.8 (4.1)	21.4 (3.8) ^c	26.3 (3.8)	+15.5
Head Start	8.8 (4.0) ^a	11.8 (3.9) ^a	14.5 (4.4) ^b	18.9 (3.7) ^b	24.0 (3.8)	+15.2
Private	12.4 (4.2) ^a	15.8 (4.2) ^a	18.4 (4.3)	22.6 (3.9)	27.5 (3.3)	+15.1
Non-Preschool	N/A	N/A	17.4 (4.4)	21.5 (4.0)	27.0 (3.8)	+9.6
Overall - 3 group sample	10.7 (4.2)	13.9 (4.3)	16.8 (4.4)	21.1 (4.0)	26.1 (3.9)	+15.4
Overall - 4 group sample	N/A	N/A	17.0 (4.4)	21.2 (4.0)	26.4 (3.9)	+9.4
WJ-Calculations						
Georgia Pre-K	N/A	N/A	N/A	4.8 (2.9)	9.8 (2.3)	+5.0
Head Start	N/A	N/A	N/A	3.4 (2.5) ^b	8.2 (2.9) ^b	+4.8
Private	N/A	N/A	N/A	5.4 (2.7)	10.6 (3.5)	+5.2
Non-Preschool	N/A	N/A	N/A	5.2 (2.8)	10.0 (2.2)	+4.8
Overall - 3 group sample	N/A	N/A	N/A	4.6 (2.8)	9.7 (2.8)	+5.1
Overall - 4 group sample	N/A	N/A	N/A	4.8 (2.8)	9.8 (2.7)	+5.0
WJ-Math Fluency						
Georgia Pre-K	N/A	N/A	N/A	10.4 (8.4)	32.0 (12.4)	+21.6
Head Start	N/A	N/A	N/A	6.4 (6.1) ^b	26.6(12.6) ^b	+20.2
Private	N/A	N/A	N/A	12.5 (7.7)	34.5 (9.8)	+22.0
Non-Preschool	N/A	N/A	N/A	11.1 (7.8)	32.5 (11.7)	+21.4
Overall - 3 group sample	N/A	N/A	N/A	10.0 (8.0)	31.4 (12.2)	+21.4
Overall - 4 group sample	N/A	N/A	N/A	10.4 (8.0)	31.7 (12.1)	+21.3

APPENDIX H
COGNITIVE AND GENERAL KNOWLEDGE: STANDARD SCORES BY PROGRAM TYPE

Standardized Tests	Fall 2001 n=630	Spring 2002 n=	Fall 2002 n=	Spring 2003 n=	Spring 2004 n=	Overall Change
WJ III-Applied Problems (avg=100, sd=15)						
Georgia Pre-K	96.9(13.0) ^a	98.5(12.3) ^a	100.4(12.3) ^a	106.3(13.0)	110.3(14.4)	+13.4
Head Start	89.5(16.8) ^a	91.4(12.6) ^a	92.96(12.7) ^b	98.6(11.2) ^b	101.7(13.3) ^b	+12.2
Private	101.2(14.9) ^a	103.9(13.8)	103.8(14.3)	110.6(13.8)	113.8(14.7)	+12.6
Non-Preschool	N/A	N/A	102.3(13.7)	107.9 (13.5)	113.6(15.9)	+11.3
Overall - 3 group sample	96.9(14.8)	98.3(13.3)	100.1(13.3)	106.0(13.4)	109.3(14.8)	+12.4
Overall - 4 group sample	N/A	N/A	100.9(13.5)	106.6(13.5)	110.6(15.3)	+9.7
WJ III-Calculations (avg=100, sd=15)						
Georgia Pre-K	N/A	N/A	N/A	108.4(15.4)	110.9(16.7)	+2.5
Head Start	N/A	N/A	N/A	102.6(13.1) ^b	103.9(17.0) ^b	+1.3
Private	N/A	N/A	N/A	109.3(14.9)	112.5(12.9)	+3.2
Non-Preschool	N/A	N/A	N/A	111.7(14.4)	113.6(14.9)	+1.9
Overall - 3 group sample	N/A	N/A	N/A	107.5(15.0)	109.8(16.3)	+2.3
Overall - 4 group sample	N/A	N/A	N/A	108.9(15.0)	111.0(16.0)	+2.1
WJ III-Math Fluency (avg=100, sd=15)						
Georgia Pre-K	N/A	N/A	N/A	100.5(9.2)	106.6(15.3)	+6.1
Head Start	N/A	N/A	N/A	96.4(7.8) ^b	101.3(12.8) ^b	+4.9
Private	N/A	N/A	N/A	101.8(8.4)	109.1(11.0)	+7.3
Non-Preschool	N/A	N/A	N/A	102.3(8.6)	107.4(13.9)	+5.1
Overall - 3 group sample	N/A	N/A	N/A	100.0(9.0)	106.0(14.2)	+6.0
Overall - 4 group sample	N/A	N/A	N/A	100.7(8.9)	106.4(14.1)	+5.7

^a All groups differ significantly from each other.

^b Head Start differs from Pre-K, Private, and non-preschool.

^c Pre-K differs from Private.

^d Pre-K differs from non-preschool.

^e Pre-K differs from Head Start.