NCEDL WORKING PAPER

# *Pre-Kindergarten in Eleven States: NCEDL's Multi-State Study of Pre-Kindergarten & Study of State-Wide Early Education Programs (SWEEP)*

## *Preliminary Descriptive Report*

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Diane Early[1], Oscar Barbarin, Donna Bryant, Margaret Burchinal, Florence Chang, Richard Clifford, Gisele Crawford, & Wanda Weaver
*University of North Carolina at Chapel Hill*

Carollee Howes & Sharon Ritchie
*University of California at Los Angeles*

Marcia Kraft-Sayre & Robert Pianta
*University of Virginia*

W. Steven Barnett
*Rutgers University*

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[1] Note: All authors contributed equally to these studies and this report. After the first author, all authors are listed alphabetically, within the university. Please address questions or correspondence to: Diane Early, FPG Child Development Institute, CB #8040, University of North Carolina, Chapel Hill, NC 27599-8040; 919-966-9721; diane_early@unc.edu

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*NCEDL's Multi-State Study of Pre-Kindergarten & Study of State-Wide Early Education Programs (SWEEP)*

# Overview

The National Center for Early Development and Learning (NCEDL) has conducted two major studies of state-funded pre-kindergarten programs: The Multi-State Study of Pre-Kindergarten that included six states and the State-Wide Early Education Programs Study that included five states. When combined, these two studies provide detailed information on pre-kindergarten teachers, children, and classrooms in 11 states. In 2001-2002 (when the current studies began), 79% of all children in the United States who were participating in state-funded pre-kindergarten were in one of these 11 states, and 83% of state dollars spent on pre-k were in one of these 11 states.[2] Combining the information from these two studies provides the most comprehensive look at pre-kindergarten in the United States.

The two studies shared common goals: to understand variations among pre-kindergarten (pre-k) programs and in turn, how these variations relate to child outcomes at the end of pre-k and in kindergarten.

This report is the first presentation of the combined data from these two studies. It provides a *descriptive* picture of pre-k children and classrooms, only. Future reports and research articles will cover more in-depth and fine-grained analyses. For instance, whereas this report presents information about average classroom quality and children's academic improvements during the pre-k year, future reports will show how quality is linked to those improvements. This report is a "first glance" at what pre-kindergarten looks like. Check the NCEDL website (http://www.fpg.unc.edu/~ncedl/) regularly for information on where to find future results.

# What is Pre-K?

For these studies, "pre-k" refers to school or center-based programs that serve 4-year olds, have an explicit goal of improving school readiness, and are funded fully or partially by the state.

Within a brief span of time, national investment in early childhood education has increased exponentially. State funds allocated to pre-kindergarten programs increased from 200 million in 1988 to almost 2 billion dollars by 1999. By 2001, as many as 43 states were offering some form of pre-k, many under the auspices of public schools. However, states vary dramatically in

[2] This number was calculated from information provided in Barnett, Hustedt, Robin, & Schulman (2003).

such key areas as: which children in their state are eligible to participate, where the programs are housed (in schools, private and public community centers), how many hours per week the classes meet, teacher education and training requirements, amount of funding provided by the state and the ways in which providers blend funds from non-state sources, and the ages of children who can receive services. For example, of the 11 states in this study, two are attempting to provide "universal access," whereby all 4-year olds in the state can participate; one allows any child in a district to participate, if the district decides to provide pre-k; and eight are specifically targeted toward low-income or "at-risk" children. Even among the eight states where the programs are specifically designed for disadvantaged children, family income cutoffs and other "risk" criteria vary widely. One goal of the present paper is to demonstrate the wide variability in state pre-kindergarten. Future papers will provide more information on how that variability relates to state policies, classroom quality, and children's academic gains.

# Methods

The current report combines data from two studies of state-funded pre-kindergarten programs. The data collection methods and instruments were largely the same in the two studies. Below is a description of the sampling, recruitment, response, and retention for each study.

By combining data from both studies, information is available from 705 classrooms and over 2,900 pre-kindergarten children in these 11 states.

For this report, each state's data have been weighted to represent that state or region and then combined into a single data set. Thus, in these estimates, states are equal with regard to size. States are not weighted on the basis of the number of classrooms in the state, and the estimates do not reflect the differences in size between states.

## Multi-State Study of Pre-Kindergarten

Pre-kindergarten data collection for the Multi-State Study of Pre-Kindergarten took place during the 2001-02 school year in six states: California, Georgia, Illinois, Kentucky, New York, and Ohio. These states were selected from among states that had committed significant resources to pre-k initiatives. States were selected to maximize diversity with regard to geography, program settings (public school or community setting), program intensity (full-day vs. part-day), and educational requirements for teachers.

In each state, a stratified random sample of 40 centers/schools was selected from the list of all the school/centers or programs (both contractors and sub-contractors) provided to us by each state's department of education. Budget and time constraints prohibited us from randomly selecting from the entire states of California and New York. In California, selection was limited to the

greater Los Angeles area and California's Central Valley. In New York, selection was limited to the greater New York City area and the greater Albany area. In both states, these regions include both the greatest population centers and some more rural areas. In the analyses reported here, data are weighted to represent only these regions. In the other states, programs were randomly selected from the entire state and all values have been weighted to represent the entire state.

In total, 238 sites participated in the fall and two additional sites joined the study in the spring. To obtain this sample of 240 sites, 335 sites were contacted. Selected sites that were found to be ineligible or declined to participate were replaced by another randomly selected site. Of the 95 that were contacted initially but did not participate, 26 were ineligible (e.g., did not receive state funds, did not serve 4 year-olds), 58 declined, and 11 never responded. Thus, of those sites that were eligible, 78% agreed to participate.

Within each selected site, we worked with the center director/principal to select randomly one classroom for participation. Eligible classrooms had to receive state funds and include at least five children who were eligible for the study. Of all randomly selected teachers, 16 teachers declined to participate (from 12 sites). Thus, of the teachers selected in the initial random draw, 94% agreed to participate in the study. In cases where the teacher declined, another classroom (and its lead teacher) from the same school was selected at random for participation.

Participating teachers helped the data collectors recruit children into the study by sending recruitment packets home with all children enrolled in the classroom. On the first day of data collection, the data collectors determined which of the children were eligible to participate. Eligible children were those who 1) would be old enough for kindergarten in the fall of 2002, 2) did *not* have an Individualized Education Plan, according to the teacher, and 3) spoke English or Spanish well enough to understand simple instructions, according to the teacher. On average, 61% of parents of eligible children in each room consented to have their child participate. From the group of eligible children with parental consent, data collectors randomly selected four children to participate. Whenever possible, two girls and two boys were selected in each classroom.

In the fall of 2001, 940 children participated. In the spring of 2002, study children who had disenrolled from their class ($n$ = 56) were replaced with another eligible child when possible. Also, additional study children were recruited in the spring in classes where fewer than four children participated in fall. In total, 76 children joined the study in the spring. This resulted in 960 children participating in the spring.

Within each state, a team of well-trained data collectors conducted the observations and assessments.

## Study of State-Wide Early Education Programs (SWEEP)

Pre-kindergarten data collection for the SWEEP Study took place during the 2003-04 school year in five states: Massachusetts, New Jersey, Texas, Washington, and Wisconsin. These states were selected to complement the states already in the Multi-State Study of Pre-K by including programs with significantly different funding models or modes of service delivery.

In each of the five states, we aimed to recruit 100 randomly selected state-funded pre-kindergarten sites for participation in the study from a list of all sites provided by the state. Budget and time constraints prohibited us from randomly selecting from the entire state of Texas. In Texas, selection was limited to the central and eastern portions of the state (including Dallas, Houston, San Antonio, and all points in between). This region encompasses the vast majority of the Texas population. In the analyses reported here, data are weighted to represent only this region. In the other states, programs were randomly selected from the entire state and all values have been weighted to represent the entire state[3].

In total, 465 sites participated in the fall. Two sites declined to continue participation in the spring, resulting in 463 sites participating in the spring. In order to recruit the 465 sites, 680 sites were contacted. Of the 215 that were contacted but did not participate, 79 were ineligible (e.g., did not receive state funds, did not serve 4 year-olds), and 136 declined or never responded. Thus, of those sites that were eligible, 77% agreed to participate.

Within each selected site, we worked with the center director/principal to select randomly one classroom for participation. Eligible classrooms had to receive state funds and include at least five children who were eligible for the study. Of the 465 teachers from the initial random selection, 26 (6%) declined to participate. When a teacher declined, another classroom (and its lead teacher) from the same school/center was selected at random for participation.

Participating teachers helped the data collectors recruit children into the study by sending recruitment packets home with all children enrolled in the classroom. On the first day of data collection, the data collectors determined which of the children were eligible to participate. Eligible children were those who 1) would be old enough for kindergarten in the fall of 2004, 2) did *not* have an Individualized Education Plan, according to the teacher, and 3) spoke English or Spanish well enough to understand simple instructions, according

[3] In Wisconsin, a small number of sites (less than 10%) in the extreme northwestern portion of the state were excluded from selection to prevent very long travel on the part of the data collectors. However, all data are weighted to represent all of Wisconsin, including the sites that were excluded from selection.

to the teacher. On average, 55% of parents of eligible children in each room consented to have their child participate. From the group of eligible children with parental consent, data collectors randomly selected four children to participate. Whenever possible, two girls and two boys were selected in each classroom.

In the fall of 2003, 1,775 children participated. In the spring of 2004, study children who had disenrolled from their class ($n$ = 111) were replaced with another study child when possible. Also, additional study children were recruited in the spring in classes where fewer than four children had participated in fall. In total, 176 children joined the study in the spring. This resulted in 1,840 children participating in the spring. Within each state, a team of well-trained data collectors conducted the observations and assessments.

# Findings

The next sections outline some key, descriptive findings from the Multi-State Study of Pre-Kindergarten and the SWEEP study combined.

## Pre-K Children and their Families

Families of study children were asked to complete a brief demographic questionnaire that included information about their family income, maternal education, and language spoken at home. These data have been weighted to represent all pre-kindergartners who met the study's eligibility criteria (old enough for K the following year, no IEP, speak English or Spanish) in these eight states and three regions.

- Annual Income: As shown in Figure 1, most families (57%) of pre-kindergarten students had annual incomes of $30,000 or less. Most pre-k students (55%) were from families whose annual incomes were less than or equal to 150% of the federal poverty income guidelines for their family's size.
- Maternal Education: As depicted in Figure 2, maternal education varied with the largest proportion reporting high school (41%) as their highest education level. Seventeen percent did not finish high school.
- Home Language: Families were asked what language(s) were spoken at home. In some cases, more than one language was reported. English was the most frequently reported home language (86%); however, Spanish was also frequently spoken at home (26%). Some language other than English or Spanish was reported by 5% of households.
- Race/Ethnicity: The children were very diverse with regard to race/ ethnicity: 35% White, 28% Latino, and 22% African American. See Figure 3.
- Gender: Slightly over half of the children (52%) were male.

Figure 1
Annual Income of Families of Pre-Kindergartners

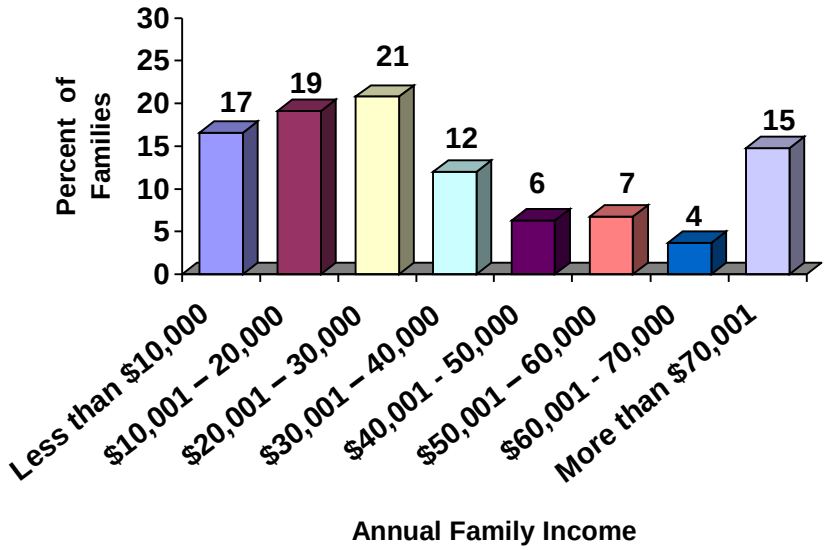



Figure 2
Maternal Education (Highest Level)

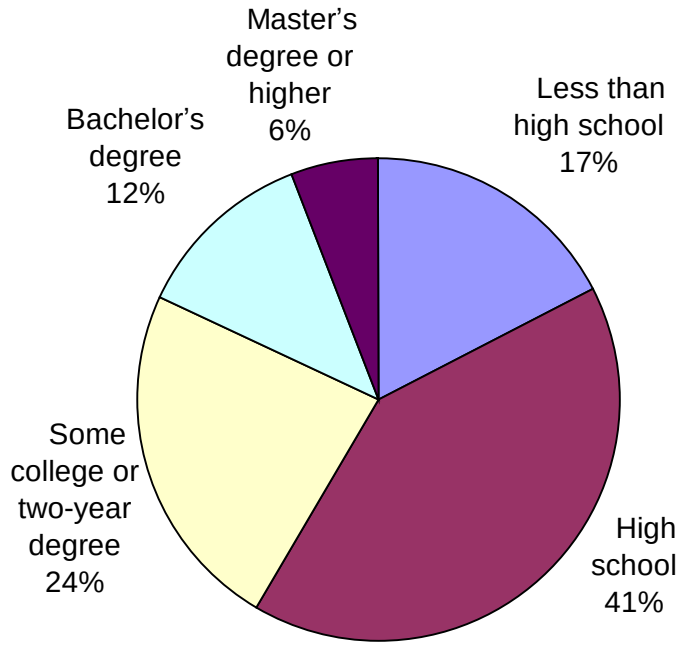
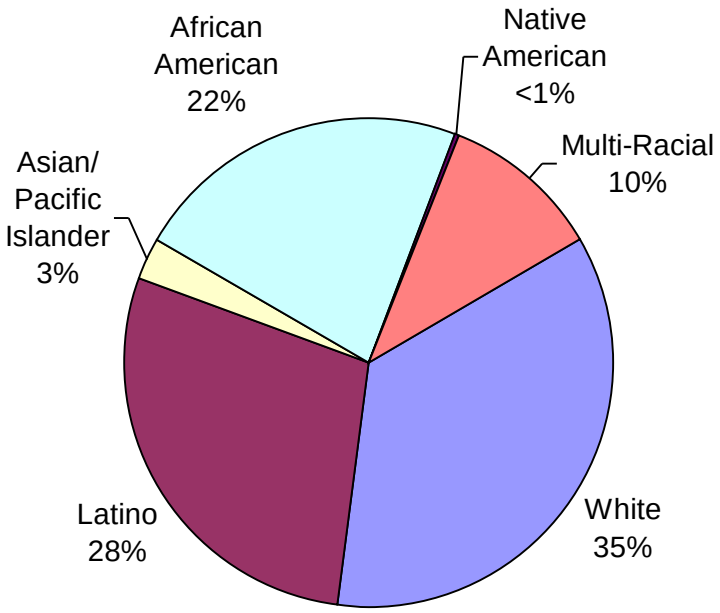


Figure 3
Ethnicity of Pre-Kindergartners




## Pre-K Teachers and their Classes

Teachers were asked to complete questionnaires in fall and spring. The fall questionnaire for teachers asked for information about:

- Teacher Demographics - information concerning teacher's age, gender, race/ethnicity, educational background, professional development, and salary

- Classroom Demographics - including children's gender, race/ethnicity, English proficiency, and special needs of all children in their classroom

The spring questionnaire for teachers asked for information about:

- Assistant Teacher - how many hours an assistant or co-teacher was in the classroom and the assistant's level of education

- Parent Involvement - quality of interactions with the study child's parents and the extent to which parents are involved in the class

- Student-Teacher Relationship - affective quality of the teacher's relationship with the child

**What are the characteristics of pre-k classes?**

- As reported by the pre-k teachers, most classrooms (67%) served only children in the year prior to kindergarten (i.e., 4- year-olds and 5-year-old who were not yet in kindergarten). Some (28%) served 3- and 4-year-olds. A small percentage of classrooms (2%) were serving 4-year-olds and kindergartners or some other age range (3%).

- On average, classes met for 24.5 hours per week. Over half of the classes (53%) met for 25 hours or less per week (see Figure 4).

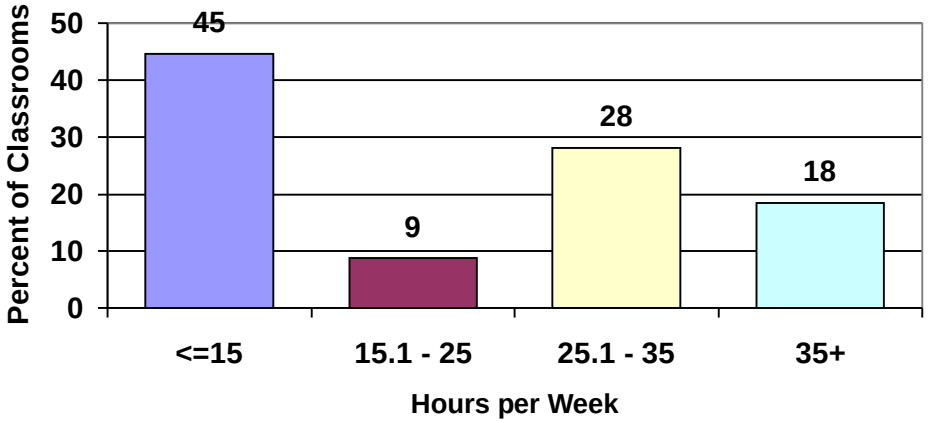
- The average pre-kindergarten class size was 17.4 in fall of the pre-k year, with ratios of 7.6 children present for each paid adult in the room.

- Teachers were asked, "What languages are spoken by children in this class?" and asked to indicate all that apply. Almost all reported that children spoke English (92%), and a large proportion also reported that some children in their class spoke Spanish (48%). An additional 21% of teachers reported that some children in their class spoke another language.

- Teachers were asked "how many of the children enrolled in this class are considered Limited English Proficient (LEP)?" In the fall, they reported that on average 21% of children in their classrooms were considered LEP.

- Teachers were asked: "How many students with special needs (with an active IEP) are enrolled in this class?" An average of 6% of students in each classroom had an IEP in the fall. In the spring, 8% had an IEP.

Figure 4
Number of hours class met per week



**Who is teaching pre-kindergarten?**

Demographic information collected on pre-k teachers indicated:

- Gender and age: Almost all teachers were female (99%). On average, they were 41 years old (range: 22 years– 73 years).

- Salary: Their average hourly wage was $20.23 (Range: $5.21 to $58.25) with an average work schedule of, 36 hours/week, 11 months/year. Pre-k teachers in public schools were generally better paid than pre-k teachers in other community settings (see Figure 5).

- Planning Time: Most teachers reported fewer than 4 hours each week of paid planning time (69%) and between 2 and 4 hours of unpaid planning time (54%).

- Race/ethnicity: As seen in Figure 6, most teachers were White (64%). Fifteen percent were Latina, and 13% were African-American.

- Language: Thirty-two percent of teachers reported that they or their assistant spoke Spanish in the classroom. Five percent reported that they or their assistant spoke a language other than English or Spanish in the classroom.

- Education: All teachers were high school graduates and most had some college experience. As shown in Figure 7, 73% of teachers had a Bachelor's degree or above.

- Major: For those teachers with a Bachelor's degree or more, 44% majored in early childhood education or child development and 25% majored in elementary education (see Figure 8). Among teachers with an Associate's degree, almost all (93%) majored in early childhood education or child development.

- Certification: Slightly over half of all teachers reported having both a Bachelor's degree (or more) and being certified by their state to teach four-year-olds (57%).

- Teaching Experience: Teachers averaged 8.56 years of experience teaching pre-kindergarten, 1.96 years teaching kindergarten, and 3.28 years teaching children older than kindergarten.

- Assistant in the classroom: Almost all teachers (87%) reported having a paid assistant or co-teacher in their classroom. In classrooms with a co-teacher or assistant, s/he was in the classroom 28 hours per week, on average.

- Assistant/Co-Teacher's Education: According to the lead teachers, the assistant/co-teachers generally had a High School degree or GED or "some college." Smaller percentages had an Associate or Bachelor's degree. See Figure 9. A Child Development Associates (CDA) credential was held by 18%.

Figure 5
Pre-K Teacher Salaries in Schools vs. Other Community Settings

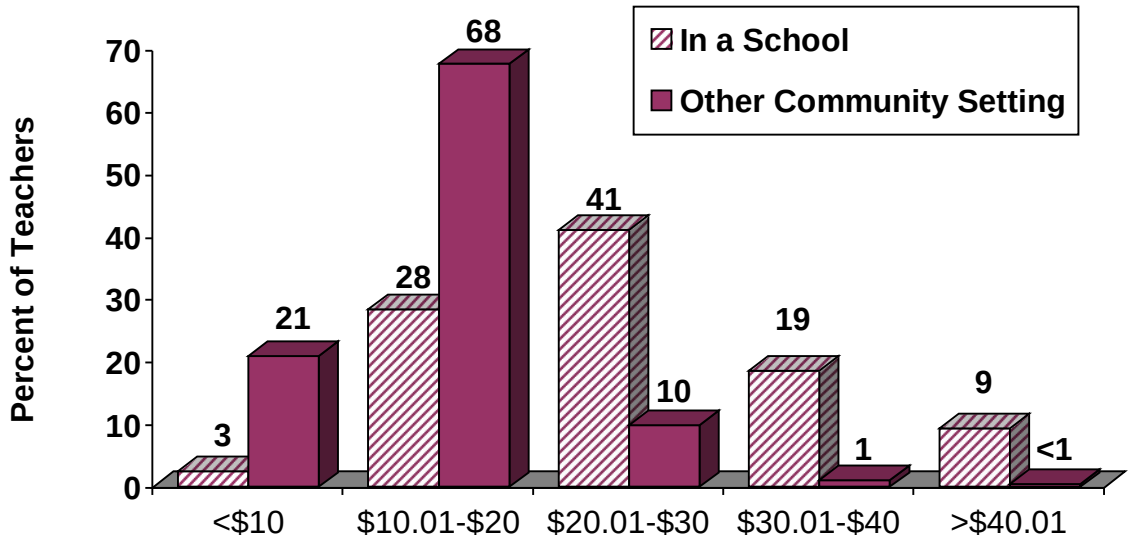



Figure 6
Race/Ethnicity of Pre-kindergarten Teachers

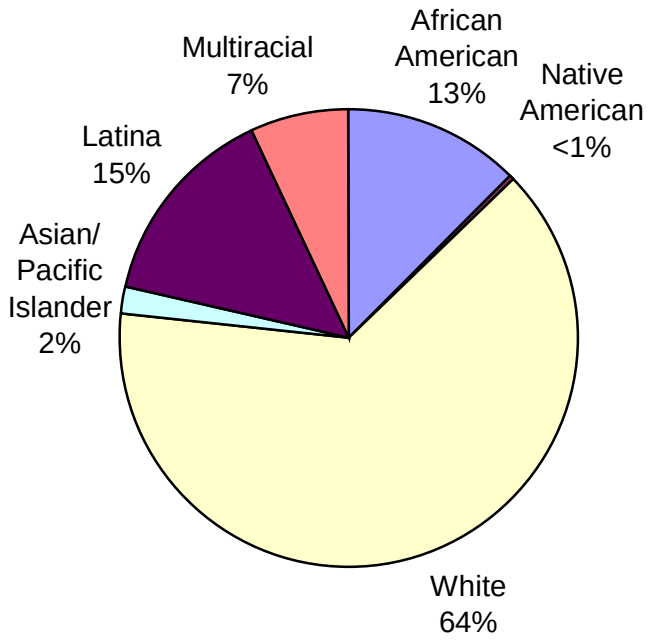


Figure 7
Education Level of Pre-Kindergarten Teachers

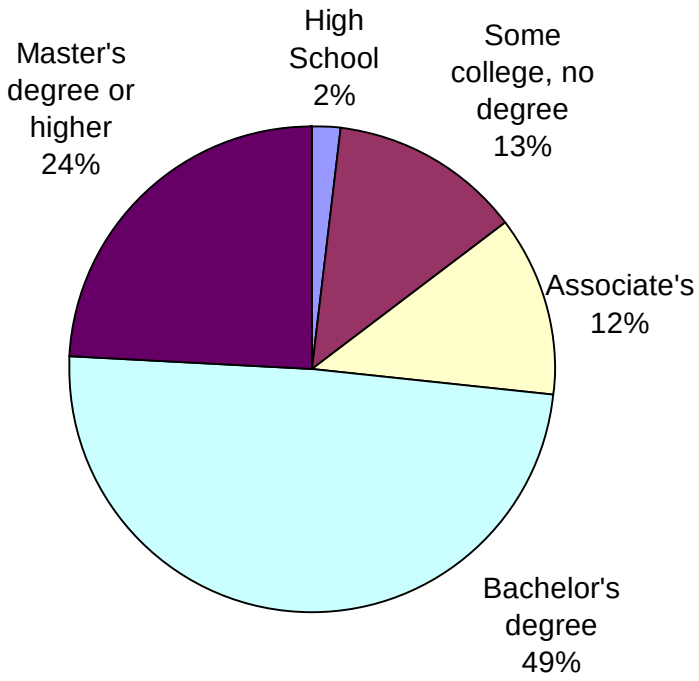



Figure 8
College Majors of Pre-Kindergarten Teachers with Bachelor's Degree or Above

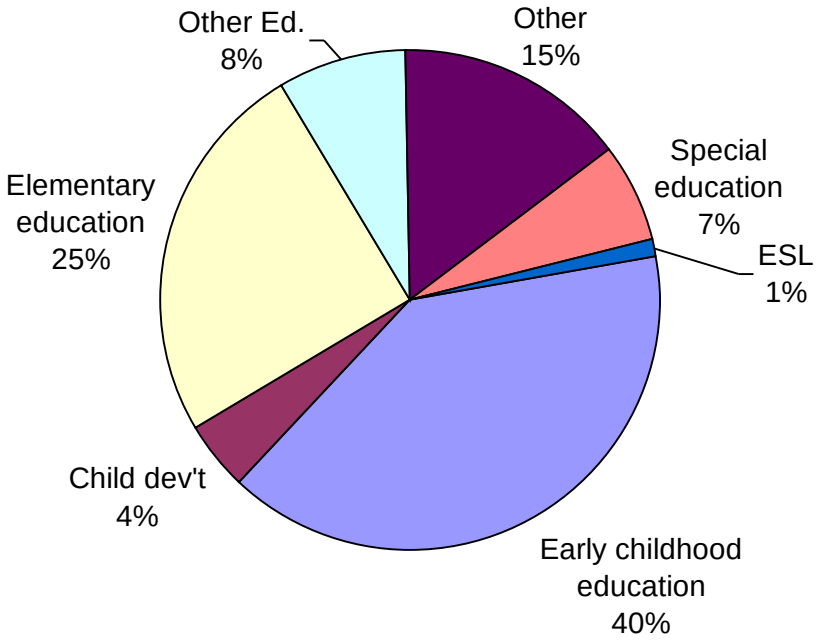
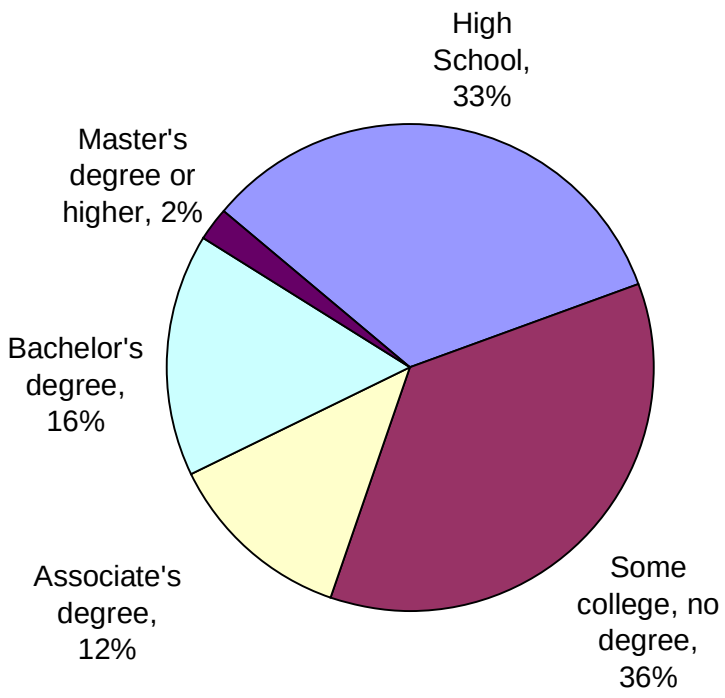


Figure 9
Education Level of Assistant/Co-Teachers




What are the characteristics of pre-k programs?
In the spring of the data collection years, each participating teacher's supervisor ($n$ = 703) received a brief questionnaire about the pre-k program. We received 619 completed questionnaires, for a response rate of 88%.

Respondents were the school principal (40%) or center director (35%), in most cases. The respondent was asked to answer all questions with regard to the specific classroom participating in the study.

- Program Characteristics: Just over half of classrooms (53%) were located in a public school building.

- Head Start: Fifteen percent were part of a Head Start program.

- Services Provided: Administrators were asked about services provided to pre-kindergarten children and their families, whether funded by state pre-k money or other funds or programs. As can be seen in Table 1, most programs offered developmental assessments of children, special services for children with special needs (e.g., speech, PT, etc.), parent education services, meals for children, and transportation. Only about one third of programs offered before school care or on-site family caseworkers.

- Teacher Benefits: As seen in Table 2, paid sick leave (93%) and fully or partially paid health insurance (93%) were available to most pre-k teachers. Only 58% had paid vacation.

Table 1
Services offered to state-funded pre-kindergarten children and families

| | % Yes |
|---|---|
| Developmental assessments | 87% |
| Special services for children with special needs | 87% |
| Parenting education or family literacy | 78% |
| Meals for children | 75% |
| Transportation | 55% |
| Health care or social services offered collaboratively by service agencies such as hospitals | 47% |
| After school care | 44% |
| Extended Care (summer or holiday) | 43% |
| Before school care | 31% |
| On-site family case workers | 36% |

Table 2
Benefits offered to pre-kindergarten lead teachers

| | % Yes |
|---|---|
| Paid sick leave | 93% |
| Fully or partially paid health insurance | 93% |
| Retirement plan | 89% |
| Unpaid maternity/paternity leave | 70% |
| Fully or partially paid dental insurance | 69% |
| Tuition reimbursement | 62% |
| Paid vacation | 58% |
| Paid maternity/paternity leave | 44% |
| Paid family leave | 37% |

**How are parents involved?**

In order to assess the amount of communication between pre-k teachers and parents, teachers were asked about the parental involvement in the classroom and the quality of the parent/teacher relationship, using a series of closed-ended, multiple-choice questions.

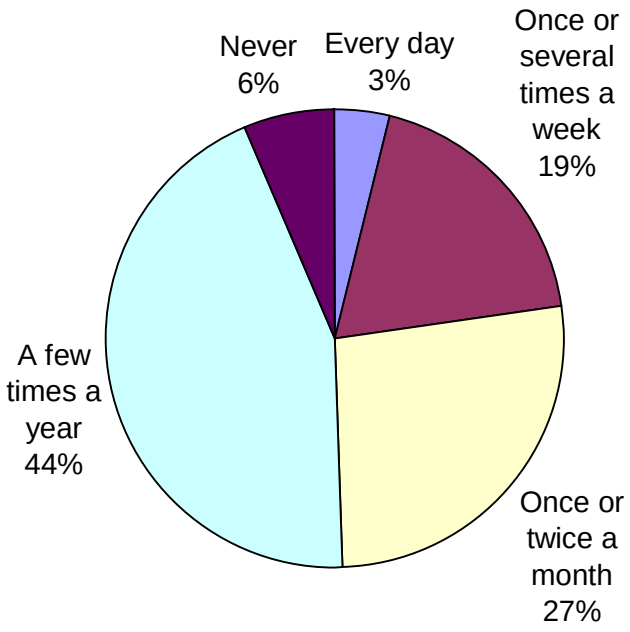
- Flexibility of Parent Visits: 89% of pre-k teachers reported parents could visit the classroom at any time, whereas 8% reported parents could only visit with advanced notice, 3% said parents could only visit at specific times, and 1% said that parents were not allowed to visit during the day.

- Parent Volunteers: When asked about their class as a whole, the largest percentage of teachers (44%) reported parent volunteers were in the classroom a few times a year. Six percent of teachers said they never had parent volunteers in the classroom (see Figure 10).

- Parent Involvement: Teachers were asked about how often the study children's parents called them, attended parent functions (e.g., PTA meetings, parent lunch), attended special events (e.g., field trips), volunteered, or sent materials to the classroom.
    - Many teachers reported that they called the parent or wrote them a note once or twice a year (42%), or almost every month (29%), though 17% said they never did. Most teachers reported that parents called them or wrote them a note once or twice during the year (46%) or almost every month (24%), though 22% of teachers said they never did.
    - Almost all teachers reported inviting parents to a parent teacher conference once or twice during the year (89%) and another 6% said they invited parents to a conference almost every month. Most teachers said the parents attended a conference once or twice during the year (84%) or almost every month (3%), but 12% said the parents never attended a conference.
    - Most teachers report that the study child's parents never volunteered at school (52%), though 31% said they volunteered once or twice a year.

- Parent-Teacher Interaction: The teachers of most study children reported that they were very satisfied with the interactions they had with parents and it was easy to work with them (62%). Teachers of about 32% of study children reported that the relationship was "okay," and teachers of 5% of study children reported that the parent-teacher relationship was "somewhat unsatisfying, could definitely be improved." Almost no teachers (<1%) said the relationship was "very unsatisfying."

Figure 10
Teacher Report of Frequency of Parent Volunteers in their Classroom




## Student-Teacher Relationships

In the spring of pre-k, teachers were asked to report the affective quality of their relationship with the children participating in the study, by rating how accurately some statements described their relationship with the child. Examples of statements about closeness include "I share a warm relationship with this child," and "This child openly shares his/her feelings with me." Statements reflecting conflict include "This child and I always seem to be struggling with each other" and "This child easily becomes angry at me." Teachers rated each statement on a 1 to 5 scale with 1 indicating "definitely does not apply" and 5 indicating, "definitely applies."

In general, teachers reported low conflict and high closeness in their relationships with students. On statements reflecting closeness, the average rating of teachers was 4.35; while on conflict statements the average rating was 1.65.

## Pre-K Classroom Activities

In order to describe a typical day in a pre-k classroom, well-trained data collectors conducted two days of classroom observation in the Multi-State Study of Pre-Kindergarten and one day in the SWEEP Study. The Emerging Academics Snapshot was used for these observations.

*Emerging Academics Snapshot* (Ritchie, Howes, Kraft-Sayre, & Weiser, 2001) The Snapshot provides information about the study children's activity setting (*e.g.*, whole group time, routine, meals, etc.) and their engagement in pre-academic activities including literacy, math, social studies, science, aesthetics, and motor. To complete the Snapshot, the observer watched the behaviors of each target child for 20 seconds, once every five minutes. In both studies, the observation day(s) lasted from the beginning of class until the end in part-day classrooms and from the beginning of the class until nap in full-day classrooms.

Figure 11 presents a summary of the proportion of time study children spent in each activity setting. Only one activity setting was selected for each 20 second interval. Activity setting was categorized as one of the following:

- Routine/Basics (e.g., toileting, standing in line, wait between activities) (22%)
- Meals/Snacks (e.g., lunch, snacks) (11%)
- Whole Group Time (teacher initiated activities like singing, calendar instruction, book reading) (28%)
- Free Choice/Center (children are able to select what and where they would like to play or learn) (28%)
- Individual Time (time assigned by teacher for children to work on their own on independent projects, worksheets, computer work, etc.) (5%)
- Small Group Time (small group activities that are teacher-organized and assigned like art projects, science experiments, etc.) (6%)

Figure 12 shows the proportion of time children were engaged in each learning activity. During a single observation interval, a child could be engaged in one, several, or no learning activities. Children were engaged in none of these activities 42% of the time (95% confidence interval: 41-44); otherwise, children's engagement in learning activities were coded as one or more of the following:

- Read to (child is being read to by an adult) (5%)
- Pre-read/read (child is reading or exploring books on his/her own or with peers) (3%)
- Letter/sound learning (phonemic awareness activities) (4%)
- Oral language development (child is involved in activities where teacher is trying to build expressive language) (7%)
- Writing (writing, pretending to write, using keyboard, tracing) (2%)
- Math (any activity involving counting, time, shapes, sorting) (8%)
- Science (activities involving exploring and learning about the environment, science equipment, animals, body parts, food/nutrition, etc.) (10%)
- Social studies (Child is talking, reading, or engaged in activities about their world including issues related to culture, family, or their school. (Dramatic/pretend play and block play is counted here.) (16%)

- Aesthetics (child is engaged in art or music activities) (16%)
- Gross motor (activities involving movement of the whole body) (7%)
- Fine motor (e.g., stringing beads, completing puzzles, using markers) (10%)

Figure 11
Percent of time pre-k children spent in various activity settings

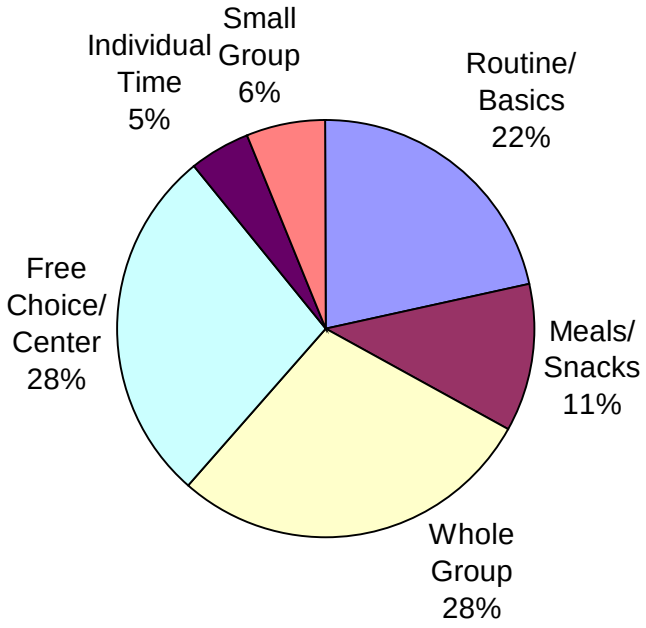
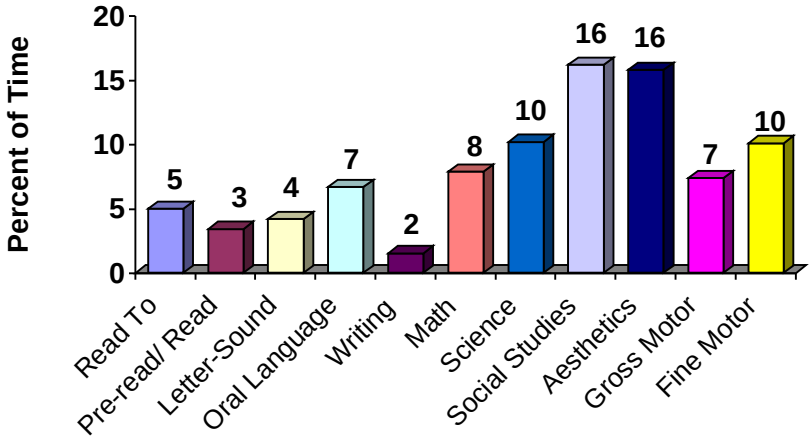



Figure 12
Percent of time pre-k children spent in various learning activities




Note: Children were not engaged in any of these activities 42% of the time.

## Pre-K Classroom Quality

Both studies included two measures of classroom quality: the Early Childhood Environment Rating Scale-Revised (ECERS-R) and the Classroom Assessment Scoring System (CLASS). The ECERS-R is a measure of global classroom quality and considers all aspects of the environment including materials, safety, health, language interactions, discipline, and relationships. The CLASS is a more focused measure of classroom quality, looking more specifically at the emotional and instructional tone of the classroom. Although the two measures both use a 7-point scale, values should not be directly compared. Descriptions of the measures are below.

## Early Childhood Environment Rating Scale-Revised (ECERS-R) (Harms, Clifford, & Cryer, 1998)

The ECERS-R is a widely used instrument for examining program quality. It was conducted during the fall of the pre-k year. It is specifically designed for use in classrooms serving children 2 ½ - 5 years of age. The study measures the following aspects of classroom quality:

- Space and Furnishings (e.g., furnishings for relaxation and comfort, room arrangement for display),
- Personal Care Routines (e.g., greeting/departing, safety practices),
- Language-Reasoning (e.g., presence/quality of books and pictures, encouraging children to communicate),
- Activities (e.g., fine motor, art, promoting acceptance of diversity),
- Interaction (e.g., supervision of children, interactions among children), and
- Program Structure (e.g., schedule, group time, provisions for children with disabilities).

Note that in these studies we do not use the "Parents and Staff" items that are part of the ECERS-R. Scores reported from this study should not be compared to ECERS-R scores from other studies that include those items.

Scores on the ECERS-R can range from 1-7 with 1 indicating "inadequate" quality, 3 indicating "minimal" quality, 5 indicating "good" quality, and 7 indicating "excellent" quality. The mean ECERS-R Total score was 3.80 (95% confidence interval: 3.73 to 3.88). See Figure 13 for the distribution of ECERS-R Total scores.

In addition to the overall score, factor analysis of the ECERS-R yielded two factors. Factor 1, labeled Teaching and Interactions, is a composite of several indicators including staff-child interactions, discipline, supervision, encouraging children to communicate, and using language to develop

reasoning skills. The mean across classrooms on this factor was 4.67 (95% confidence interval: 4.54 to 4.80). See Figure 14 for the distribution.

The second factor, termed Provisions for Learning, is a composite of indicators such as furnishings, room arrangement, gross motor equipment, art, blocks, dramatic play, and nature/science. The mean across classrooms on this factor was 3.73 (95% confidence interval: 3.63 to 3.82). See Figure 15 for the distribution.

Figure 13
Distribution of ECERS-R Total Scores (mean = 3.80)

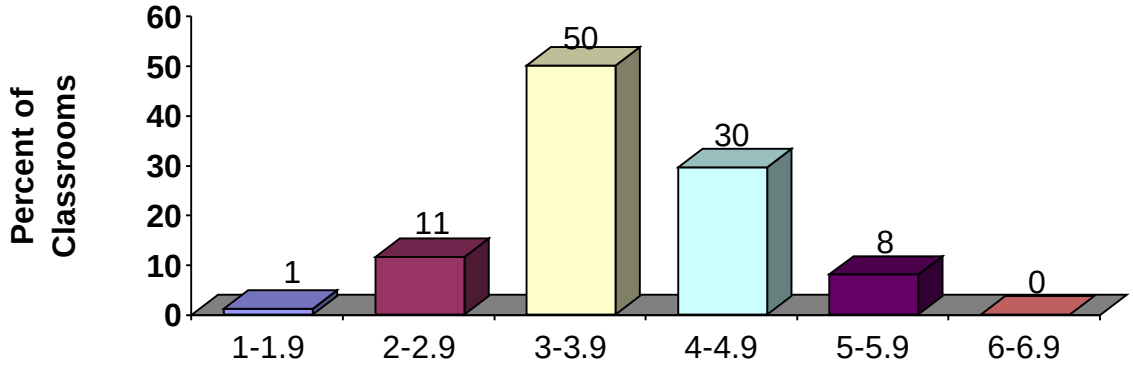



Figure 14
ECERS-R Factor 1: Teaching and Interactions (mean=4.67)

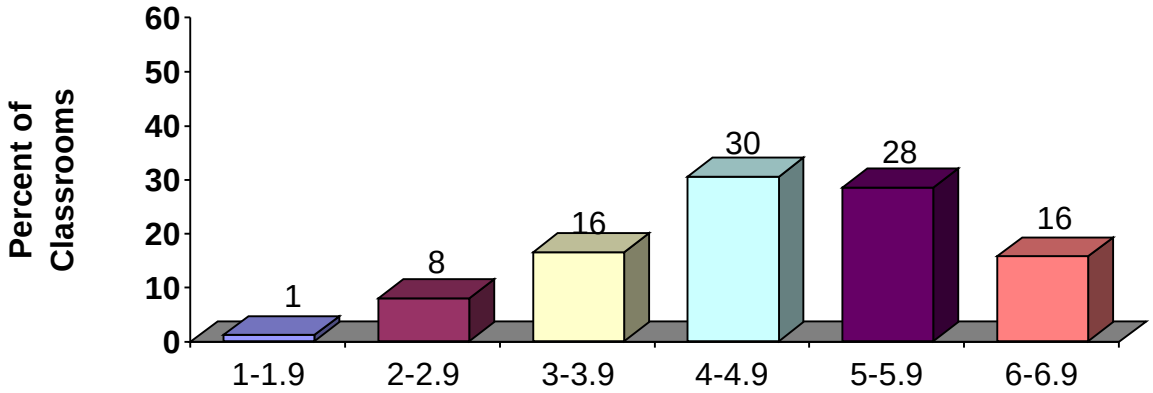
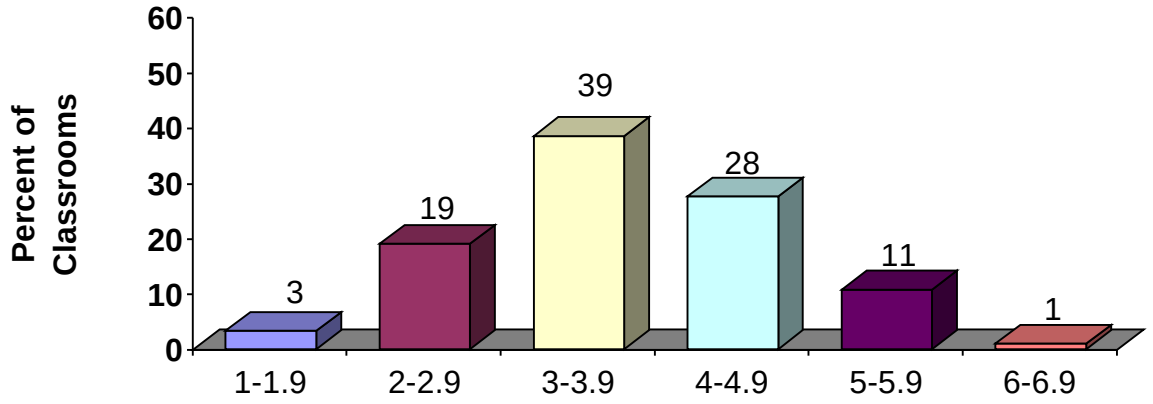


Figure 15
ECERS-R Factor 2: Provisions for Learning (mean = 3.73)




**Classroom Assessment Scoring System (CLASS)**
**(Pianta, La Paro, & Hamre, 2004)**

The CLASS provides an assessment of the classroom quality as indicated by information about the emotional climate, classroom management, and instructional methods. The observer rated the pre-k classroom and the teacher on 9 dimensions roughly every 30 minutes, throughout the spring observation day(s) (same day(s) as the Snapshot).

Each dimension is rated from 1-7 with 1 or 2 indicating the classroom is low on that dimension; and 3, 4, or 5 indicating that the classroom is in the mid-range; 6 or 7 indicating the classroom is high on that dimension.

The 9 dimensions and a short description are listed below:

- Positive climate: reflects the enthusiasm, enjoyment, and respect displayed during interactions between the teacher and children and among children
- Negative climate: considers the degree to which the classroom has a negative emotional and social tone (displays of anger, aggression, and/or harshness)
- Teacher sensitivity: includes the extent to which teachers provide comfort, reassurance, and encouragement
- Over-control: reflects the extent to which classroom activities are rigidly structured or regimented
- Effective behavior management: encompasses the teacher's ability to use effective methods to prevent and redirect children's misbehaviors
- Productivity: reflects how well the teacher manages instructional time and routines so that children learn and make progress
- Concept development: considers the strategies teachers employ to promote children's higher order thinking skills and creativity through problem-solving, integration, and instructional discussions

- Instructional learning format: includes the available activities, method of presentation, use of groupings, and range of materials that teachers use to maximize children's engagement
- Quality of feedback: focuses on the quality of verbal evaluation provided to children about their work, comments, and ideas. Feedback focuses on learning processes, not correctness or the end product.

Factor analysis of the CLASS yielded two factors. Factor 1, labeled Emotional Climate, is a composite of Positive Climate, Negative Climate (reversed), Teacher Sensitivity, Over-control (reversed), and Behavior Management. Figure 16 shows the distribution of the Emotional Climate scores (mean 5.52; 95% confidence interval = 5.44 to 5.59).

The second factor, labeled Instructional Climate, is a composite of Concept Development and Quality of Feedback. Figure 17 shows the distribution of the Instructional Climate scores (mean 2.03; 95% confidence interval = 1.95 to 2.10).

Figures 18 and 19 show the distribution of the Productivity (mean 4.51; 95% confidence interval = 4.42 to 4.61) and Instructional Learning Format (mean 3.97; 95% confidence interval = 3.87 to 4.02) items. These items are not included in either composite score, but are important aspects of classroom quality.

Figure 16
CLASS Emotional Climate Composite [Positive Climate, Negative Climate [reversed], Teacher Sensitivity, Over-control [reversed], and Behavior Management) (mean = 5.52)

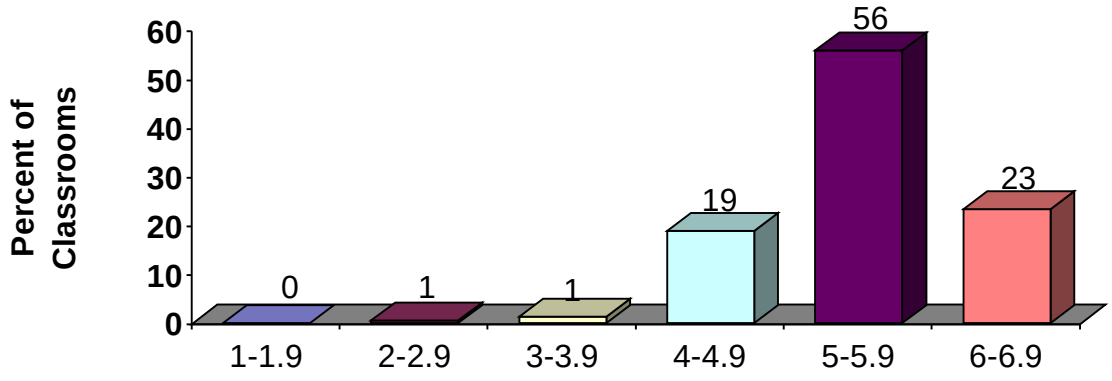


Figure 17
CLASS Instructional Climate Composite (Concept Development and Quality of Feedback) (mean = 2.03)

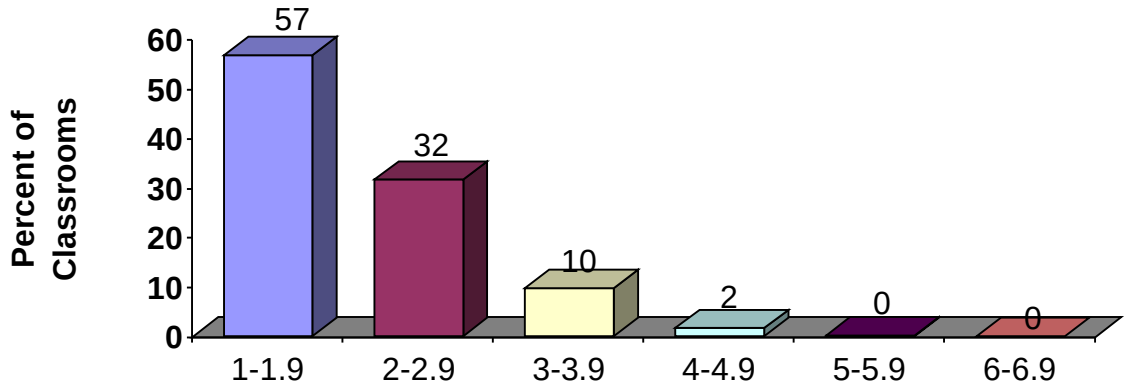



Figure 18
CLASS Productivity (mean = 4.51)

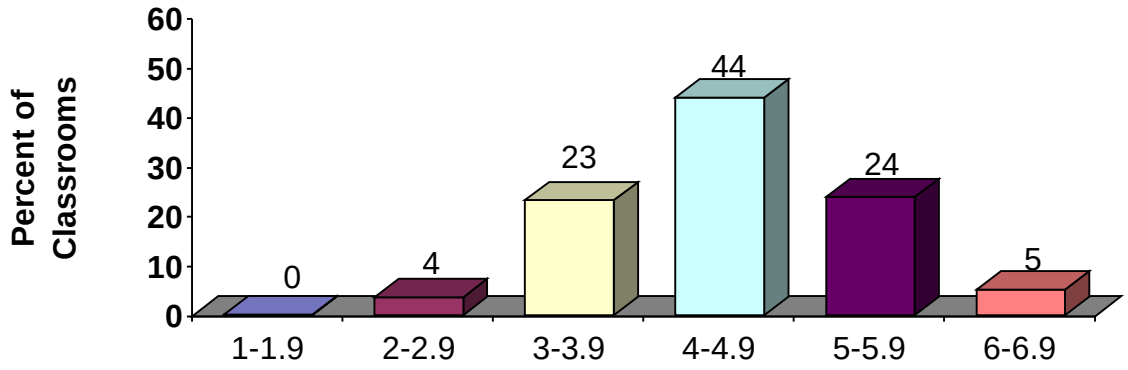
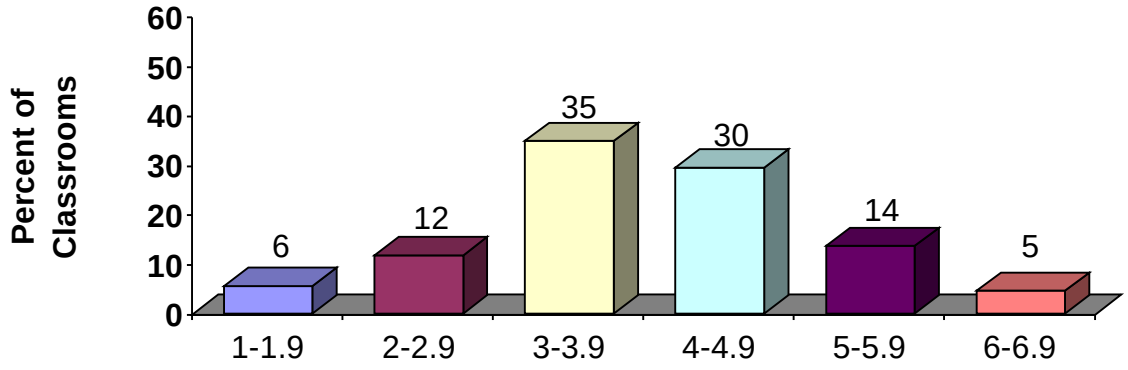



Figure 19
Instructional Learning Formats (mean = 3.97)



## Pre-K Students' Academic Assessments

Children's academic skills were assessed twice during the pre-kindergarten school year, once in the fall and once in the spring. Children who did not speak English at home were screened for English proficiency. When appropriate, children were given a similar battery in Spanish. The information presented below includes only the children who were tested in English. In the fall, 2,298 children were tested in English (85% of all children tested), and in the spring 2,443 were tested in English (89% of all children tested). Below is a description of each measure. Figures 20 and 21 show the mean scores at each time point.

*Peabody Picture Vocabulary Test 3rd edition (PPVT-III)* (Dunn & Dunn, 1997). The PPVT-III serves as an achievement test of receptive vocabulary. Children are shown a set of 4 pictures and are asked to select the picture that best represents the meaning of a word spoken by the examiner. A standard score is computed for this scale. The measure has been standardized, so that nationally, children attain an average score of 100.

*Oral & Written Language Scales* (OWLS) *(Oral Expression Scale)* (Carrow-Woolfolk, 1995). The Oral Expression Scale is a standardized measure designed to assess the understanding and use of spoken language. During the assessment, the examiner reads a verbal stimulus aloud while the child looks at a stimulus board containing one or more pictures. Children are required to respond orally by answering a question, completing a sentence, or generating a new sentence (or sentences). A standard score is computed on this scale. Nationally, the average standard score is 100.

*Woodcock-Johnson III Tests of Achievement*: *Applied Problems Subtest* (Woodcock, McGrew, & Mather, 2001). The Applied Problems subtest of this standardized measure examines the ability to analyze and solve math problems. For this task, a standard score is computed with a national average of 100.

*Identifying Letters* (NCEDL, 2001). The ability to identify letters is a key indicator of emergent literacy**.** In this assessment, children are shown a set of mixed capital and lowercase letters and asked to identify as many letters as they can. The highest possible score is 26.

*Identifying Numbers* (NCEDL, 2001). The ability to identify numbers is an indicator of emergent numeracy**.** Children are shown a sheet of numbers (1-10 printed in random order) and asked to identify as many numbers as they can. The maximum possible score is 10.

*Color Bears* (Head Start Family and Child Experiences Survey, 1998). To assess color recognition and identification, children were shown a page of 10

different colored bears and asked which colors they could name. They were asked to point to the bear as they named the color. The maximum score is 10.

Four measures (PPVT-III, OWLS, and the Applied Problems & Letter-Word Identification Subtests from the Woodcock-Johnson III) are standardized measures with a mean of 100. When scores remain the same over time, that does not indicate that children did not learn. Children who learn an average amount during the school year should obtain the same score in the spring as they did in the fall. A gain in a standardized score from fall to spring means that the child learned more than a child typically learns in that period of time.

Changes in scores across time should be interpreted with caution. These studies have no control group (e.g., a group of children who did not attend pre-kindergarten), therefore we can not be certain that these gains can be attributed to the pre-kindergarten experiences. These children may have learned the same amount if they had been at home with a parent or in child care. Because standard scores were in the low-90s when children entered pre-kindergarten, we do know that their learning prior to entering pre-k was below average.

Figure 20
Mean standard scores on standardized measures of achievement

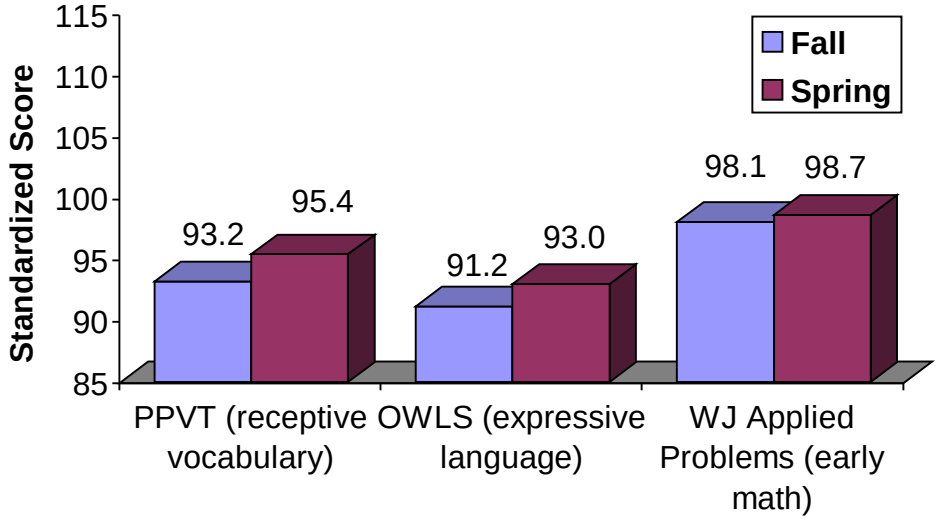
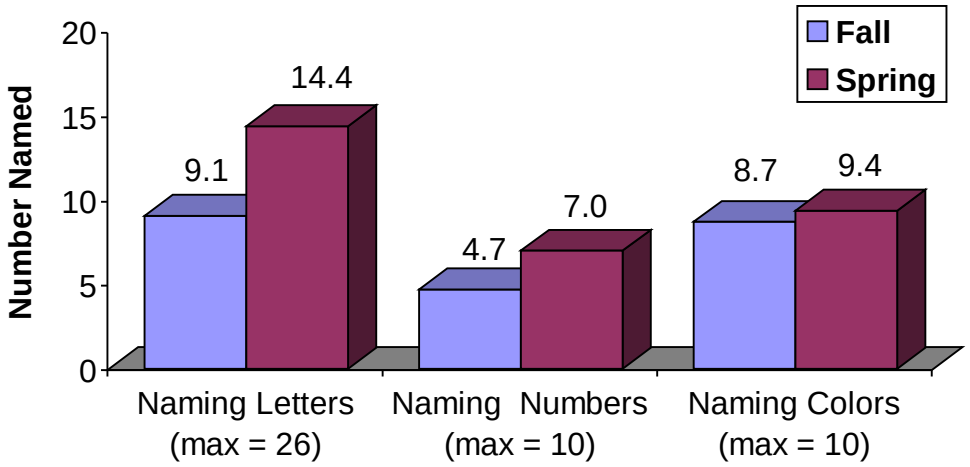


Figure 21
Mean standard scores on non-standardized measures of early academic skills




## Teachers' Reports of Children's Language, Literacy, and Math Skills

In addition to the child assessments conducted by data collectors, teachers were asked to rate the children's academic skills. Teachers rated children's language and literacy skills in both the fall and the spring of pre-k (NCES, 1999), using the items listed below. They were asked to think of the study child's skills "in comparison to other students in the same grade level."

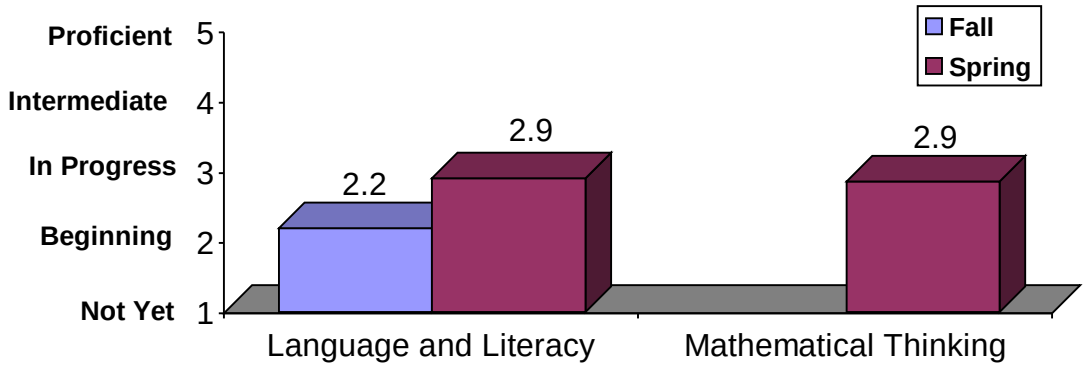
- Using complex sentence structures (e.g., "If she had brought her umbrella, she wouldn't have gotten wet")
- Understands and interprets a story or other text read to him/her (e.g., retells a story just read to the group, connects part of the story to his/her own life)
- Easily and quickly names all upper and lower case letters of the alphabet
- Produces rhyming words
- Predicts what will happen next in stories (by using the pictures and storyline for clues)
- Reads simple books independently (e.g., reads books with repetitive language pattern)
- Demonstrates early writing behaviors (e.g., using initial consonants to spell words)
- Demonstrates an understanding of some of the conventions of print (e.g., uses both upper and lower case letters, puts spaces between words)
- Uses computer for a variety of purposes (e.g., drawing, counting, typing)

In addition to language and literacy skills, teachers also rated mathematical skills in the spring of the pre-k, again "in comparison to other students of the same grade level". Mathematical skills rated included:

- Sorting, classifying, comparing math materials by various rules and attributes (e.g., sorting by several attributes such as "large plastic shapes" and "small wooden shapes")
- Ordering a group of objects (e.g., ordering sticks by length)
- Showing an understanding of the relationship between quantities (e.g., knows 10 small stones is the same quantity as 10 large stones)
- Solves problems involving numbers using concrete objects (e.g., "Vera has six blocks, George has three, how many blocks are there in all?")
- Demonstrates an understanding of graphing activities (e.g., adding a cube or coloring a graph of "how we get to school" using yellow for "bus," white for "car," and blue for "walking")
- Uses instruments accurately for measuring (e.g., using a balance scale to compare the weight of two objects)
- Uses a variety of strategies to solve math problems (e.g., using manipulative materials or looking for a pattern)

Teachers rated student's achievement using a 1 to 5 scale with 1 = Not Yet, 2 = Beginning, 3 = In Progress, 4 = Intermediate, and 5= Proficient. The language, literacy, and math skill ratings were meant to cover a broad range of skills that children in pre-kindergarten and early elementary school might show. Thus, some of the skills listed may not be appropriate for all ages of young children, but were asked to assess how children's skills change over time. See Figure 22 for mean scores on these teacher report measures.

Figure 22
Mean standard scores on non-standardized measures of early academic skills




Note: The Mathematical Thinking items were not asked in the fall of pre-kindergarten.

## Pre-K Students' Social Skills and Behavioral Problems

Teachers completed questions concerning study children's social skills and behavior problems (Hightower et al., 1986). In both the fall and spring, information gathered about social skills included:

- Assertiveness (5 items including participates in class discussions, comfortable as leader)
- Frustration Tolerance (5 items including ignores teasing, copes well with failure)
- Task Orientation (5 items including well-organized, completes work)
- Peer Social Skills (5 items including has many friends, well-liked by classmates)

For these ratings, teachers scored study children individually using a scale from 1-5 on how well statements described the child with 1 = Not at all, 3 = Moderately well, and 5 = Very well. The overall Social Skills score is the mean of all the items on the Assertiveness, Frustration Tolerance, Task Orientation, and Peer Social Skills scales.

Information gathered about behavior problems included:

- Conduct Problems (6 items including disruptive in class, overly aggressive)
- Internalizing Problems (6 items including anxious, unhappy)
- Learning Problems (6 items poor work habits, difficulty following directions)

For these ratings, teachers scored study children individually using a scale from 1-5 on how well statements described the child with 1 = Not a problem, 3 = Moderate, and 5 = Very serious problem. The overall Problem Behaviors score is the mean of all the items on the Conduct Problems, Internalizing Problems, and Learning Problems scales. Figures 23 and 24 show the mean teacher ratings of pre-k students' Social Skills and Behavior Problems.

Figure 23
Teacher ratings of children's social skills

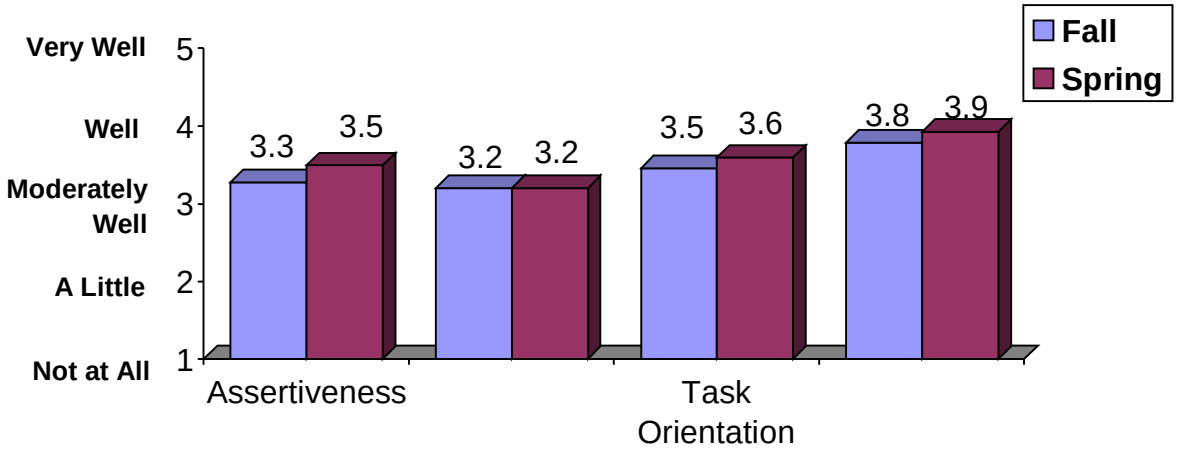
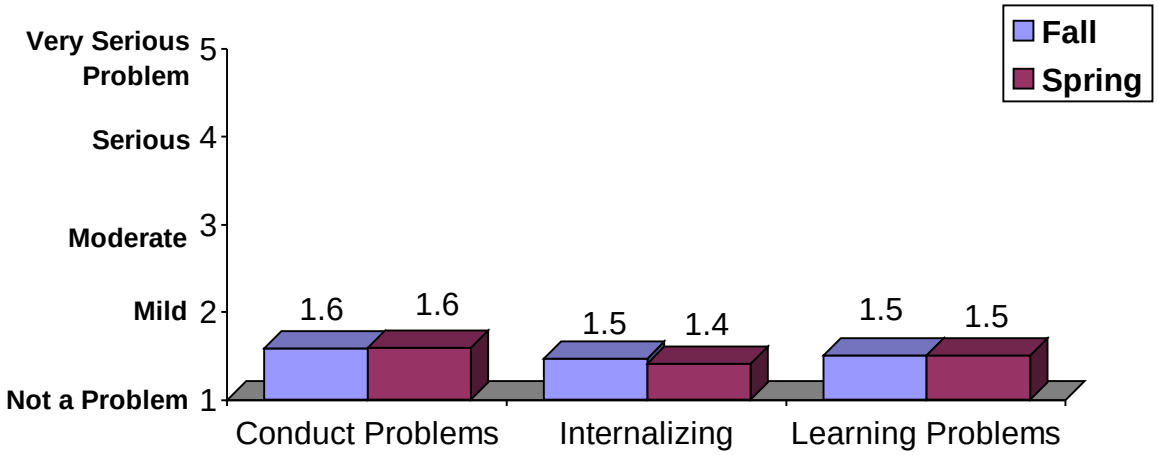



Figure 24
Teacher ratings of children's behavior problems




# Key Findings

- Most states implemented pre-k programs as an effort to decrease the achievement gap between low-income children and their more economically advantaged peers. Even states that have attempted to provide universal pre-k give priority to low-income or "at risk" children. Data from these studies indicate that across the 11 states, the majority of children enrolled in pre-k are from families with low incomes and low levels of maternal education. Many have other risk factors, such as limited English proficiency.
- The average pay for pre-kindergarten teachers is well above what has been typically reported among child care teachers, but still below typical elementary teacher salaries. Reporting overall average pay, however, masks large disparities in salaries across settings: pre-k teachers in

public schools are generally paid much more than pre-k teachers in other community settings.

- The majority of pre-kindergarten teachers in state funded programs are well educated. Most have a Bachelor's degree or more, with a major in early childhood education/child development and a state certification to teach 4-year olds. This represents substantially more education and training than early childhood educators in community child care or Head Start.
- Program hours vary widely. Children are served anywhere from 6 ½ to 60 hours per week. While 45% provide 15 or fewer hours per week, 18% provide more than 35.
- The average class size of just over 17 and the ratio of 7.6 children for each paid adult are well within the recommended standards for this age group although the standards were not developed specifically for classrooms with high proportions of children at-risk.
- A surprisingly high percentage of the pre-kindergarten day is spent eating meals and performing routines like hand-washing or standing in line. Additionally, children are not engaged in constructive learning or play a large portion of the day. Children have relatively few meaningful interactions with adults during the pre-k day.
- Pre-k classrooms typically have a pleasant, warm atmosphere; and some classrooms are achieving "good" levels of quality. However, in general, classroom quality is below what past research has indicated children need for the best learning outcomes. Instructional quality, in terms of helping children learn new concepts and providing useful feedback, is especially problematic.
- Children make progress during the pre-kindergarten year in language, literacy, and numeracy. Whereas the study design does not permit us to know if the children gained more than they would have in another setting, we can say that they finish pre-kindergarten with more skills and closer to national norms than when they start.
- At the beginning of the year, pre-k teachers see the children as having good social skills and few behavior problems. Teachers report improved social skills during the pre-kindergarten year.

## Study Limitations

The combined data from the two studies provide rich information with regard to pre-k classroom quality, teacher characteristics, and children's academic skills. Information was obtained from many different individuals (children, parents, teachers, administrators) and using multiple methods (observations, direct assessment, interview, survey). And, the observations were conducted

over multiple days, decreasing the likelihood that one exceptional day dramatically altered the findings.

Nonetheless, the information is not perfect. For instance, some data are from teachers' answers to written surveys, where sometimes questions are misread or misunderstood. Likewise, administrators are not always aware of how programs are funded and regulated, leading to some mistakes when reporting on issues such as Head Start participation and services offered. All data collectors were trained to a high-level of reliability on the classroom observation measures. Nonetheless, observational measures always contain a certain amount of observer error. Further, this study was not an experiment in which children were randomly assigned to either attend pre-k or not, making it impossible to know how much of the gains in children's academic and social skills were caused by their pre-k experiences. Readers should keep these study limitations in mind when interpreting the findings. With cautious interpretation, however, we believe these studies can help us better understand the issues, problems, and opportunities within pre-k education.

# Conclusions and Future Directions

Many of the programs in the 11 states meet current professional guidelines for structural features of quality. For instance, the National Association for the Education of Young Children (NAEYC, 1997) and the National Institute for Early Education Research (NIEER; Barnett et al., 2004) recommend that four-year-olds be in classrooms no larger than 20 with a child-to-teacher ratio of no more than 1-to-10. We estimate that in these 11 states, 79% of rooms meet both these guidelines.

Likewise, NIEER (Barnett et al., 2004) and the National Academy of Sciences Committee on Early Childhood Pedagogy (Bowman, Donovan, & Burns, 2000) recommend that every pre-kindergartner have a teacher with at least a Bachelor's degree and formal training in early childhood education. In these states, 73% of the classrooms had a teacher with at least Bachelor's degree and 57% had a teacher with both a Bachelor's degree and a state teaching certification to teach 4-year-olds or majored in early childhood education/child development. Thus, whereas some classrooms need improvement with regard to these structural features of quality, many have already attained a high level of quality in these areas.

Nonetheless, "process quality" (or the quality of interactions and activities provided for children) was, on average, lower than expected. Although the classrooms were generally friendly, warm environments (as evidenced by the ECERS-R Teaching and Interactions Sub-Scale and the CLASS Emotional Climate Sub-Scale), instructional quality was low and learning interactions between teachers and children were infrequent.

As mentioned earlier, many state pre-k programs are relatively new and have experienced recent dramatic growth. Under these circumstances, states have

largely attained adequate structural quality, but have had more difficulty attaining high levels of process quality.

These findings point to the need to improve state-funded pre-k classroom process quality and instruction. From these data it appears that states cannot rely solely on professional standards and structural indicators of quality (e.g., ratios, teacher education) to ensure that their programs are fulfilling their potential. To improve classroom quality and interactions, states may consider providing teachers with additional supports to further their knowledge and use of appropriate instruction for young children. These supports might come in the form of mentoring relationships, technical assistance, or increased supervision. Likewise, state systems of teacher preparation and professional development may require supports in order to increase their capacity and quality.

NCEDL will continue to analyze the extensive data collected for these studies, along with information from key informants and other research in early childhood education, to inform the field about strategies for quality improvement. If high levels of structural quality are not sufficient for ensuring high level of process quality, what can be done to improve process quality?

Some questions that NCEDL will try to answer using these data are:

- How are structural and process quality linked to children's academic and social gains across the pre-k and kindergarten years? Several different types of statistical techniques will be used to consider possible relations between these important types of information.
- How are various teacher characteristics like education, training, certification, year's of experience, professional beliefs and mental health linked to classroom process quality?
- How are program features, such as length of the school day, length of the school year, and per pupil expenditure related to classroom quality and children's academic growth?
- Is the classroom curriculum, as reported by the teacher, linked to classroom quality or children's academic gains?
- How are children who attend pre-k for two years different from those who attend for only one year? Are gains in the four-year-old year similar across the two groups?
- How are Spanish-speaking children faring in pre-kindergarten? Fifteen percent of the children in these studies started pre-kindergarten with limited English skills and took the assessment battery in Spanish. We will investigate these children's experiences and academic growth across the pre-kindergarten year.

- What is the mental health status of pre-kindergartners? How does their mental health relate to other aspects of their education and growth and to the quality of their classrooms?
- What about families? In-depth information was collected about parents' attitudes and home-life from a sub-set of the families in the Multi-State Study of Pre-Kindergarten. We will investigate the family's role in choosing a pre-kindergarten program and supporting their child's learning, as well as the importance of parent-teacher relationships.

## For More Information

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