

What is Pre-Kindergarten? Characteristics of Public Pre-Kindergarten Programs

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States have accumulated considerable experience in operating publicly sponsored pre-kindergarten programs. In spite of this extensive experience, only fragmentary accounts exist of how these pre-kindergarten (pre-k) programs handle issues such as program intensity, location, staffing, and population served. These issues are addressed by the National Center for Early Development and Learning's Multi-State Study of Pre-Kindergarten, which collected data from 240 programs. Data were weighted to represent the 4 states (Georgia, Illinois, Kentucky, Ohio) and each of the 2 regions in California and New York from which they were drawn. Using these weighted data, we estimate that slightly more than half of these school-related programs were part-day and slightly more than half were located outside of school buildings. Although these programs varied in process quality, on average, they met National Association for the Education of Young Children recommended standards for class size, adult:child ratios, and teacher certification. The programs served an ethnically, linguistically, and economically diverse population of children, although about half of pre-k children were from low-income backgrounds. African American, Asian, and Latino children were more likely than White children to attend a pre-k class with a high proportion of children from low-income backgrounds. Issues of process quality were highlighted in the study.

The 2000 Current Population Survey indicated that 52% of parents report that their 3- and 4-year-old children are in school—some 4 million children overall (U.S. Census Bureau, 2000). This percentage is up from only 21 % in 1970 (U.S. Census Bureau, 2001). Within a brief span of time, national investment in early child-

hood education has increased exponentially. State funds allocated to pre-kindergarten (pre-k) programs increased from \$200 million in 1988 to almost \$2 billion by 1999 (National Center for Children in Poverty, 2000; Schulman, Blank, & Ewen, 1999; Wohl, 2001). By 2001, as many as 43 states offered some form of pre-k, many under the auspices of public schools (Barnett, Robin, Hustedt, & Schulman, 2003). *Pre-k* is used here to refer to center-based programs for 4-year-olds that are fully or partially funded by state education agencies and that are operated in schools or under the direction of state and local education agencies. Head Start programs are included but only when the school system served as the grantee or delegate. Excluded are family home-based care, programs for children under 4, and programs targeted at parents or solely at children with disabilities. This definition is similar to those used in other major studies of pre-k (Barnett et al., 2003; Brown & Scott-Little, 2003).

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This surge of interest is attributable in part to an expanding awareness of the importance of children's school readiness and to the increasing numbers of mothers working outside of the home. Research confirming the effects of environmental enrichment on the number and complexity of neuronal connections made in early childhood has also fueled this interest by underscoring the importance of high-quality experiences to the development of young children (Shonkoff & Phillips, 2000). Landmark studies such as the Carolina Abecedarian Study and the Perry Pre-school High/Scope Study have demonstrated convincingly the long-term beneficial effects of early childhood programs on the cognitive, social, and emotional development of children growing up in risky environments (Campbell & Ramey, 1994; Schweinhart & Weikart, 1998). Together these factors have motivated policymakers to make early childhood initiatives a priority, especially for children who may be at risk for later school failure. Court rulings in New Jersey require pre-k programs for 4-year-old children in economically disadvantaged communities in the state. Pre-k has been an issue in several other court cases as well (Committee for Economic Development, 2002).

Although much progress has been made in providing access to pre-k programs, recent reports find that few states were serving more than 20% of their 4-year-olds (Barnett et al., 2003; Bryant et al., 2003). Because 16 states do not have pre-k programs and existing programs are only serving a fraction of the 4-year-olds in their states, considerable expansion of pre-k programs is likely in the years to come. Gilliam and Ripple's (2004) national survey of state-funded pre-k found that not only are states at varying stages in their development of pre-k but they are also making different decisions regarding design, organization, and staffing. It is becoming increasingly important to understand the implications of these varying program decisions on program quality and child outcomes as the demand for high quality early child care increases.

Because a number of states have been implementing pre-k for years, a study of their collective efforts can yield valuable lessons for other states that have yet to begin pre-k initiatives or that are still in the early stages of program implementation. Although several reports have described the status of state pre-k programs (e.g., see Barnett et al., 2003; Bellm, Burton, Whitebook, Broatch, & Young, 2002; Blank, Schulman, & Ewen, 1999; Council of Chief State School Officers, 2002; Gilliam & Ripple, 2004; Gilliam & Zigler, 2001; Knitzer & Page, 1998; Mitchell, Ripple, & Chanana, 1998; National Center for Education Statistics [NCES], 2003; Ripple, Gilliam, Chanana, & Zigler, 1999), a coherent picture of pre-k is difficult to form due to inconsistency in definitions, a failure to specify whether children and

program are in schools or school-related facilities, and the absence of data on the nature and quality of experiences and the relationship of program attributes to child outcomes.

This article presents data from the National Center for Early Development and Learning's (NCEDL) Multi-State Study of Pre-Kindergarten, the first major comprehensive study of pre-k across multiple states. The goals of this article are twofold. First, it describes the children and families served by pre-k, the quality (process and structural) of pre-k programs, the attributes of pre-k teachers, and basic policy decisions guiding the implementation of the program. The second goal is to examine the relation of structural features to other attributes of pre-k and the population of children and families served. For example, issues include whether certain groups of children attend part-day versus full-day programs or have more educated teachers than other groups of children. As pre-k programs develop and grow, policy decisions are being made with little appreciation of the implications these decisions have on programs and the children and families served. In particular, implications of decisions regarding structural features (i.e., location, length, etc.) need to be understood, as they are the most amenable to regulation. Three structural features that may be critical to the implementation and outcomes of pre-k are location of the program, length of school day, and education of the teacher.

Location

A basic decision when implementing a pre-k program is whether to house the program in public schools, community centers, or a combination of the two. *Community centers* describes a broad host of locations including for-profit child care centers, non-profit agencies, faith-affiliated programs, and Head Start. Only seven states restrict their pre-k sites to public schools, with the majority of states allowing other types of facilities to receive funding either directly or subcontracted by the local public school district (Mitchell et al., 1998). Public schools are often involved in pre-k programs as Head Start grantees or as subcontractors. Although it is not widely recognized, school districts served as the grantee or delegate agency for 17% of Head Start programs and reported serving some 135,000 children in 2001–2002 (K. Keating, Manager of Head Start Program Information Reports, personal communication, April 28, 2003).

One basic question surrounding pre-k policy is whether programs operated under the auspices of public schools differ from other programs. Co-location with other public school classrooms may increase the likelihood that the pre-k program will be influenced by

the culture of the school, perhaps with a greater emphasis on academics than in pre-k classrooms in other community settings. School-based pre-k classes may be subjected to different regulations and more monitoring than occurs in nongovernment, community-based organizations, even ones that provide services by contract with school districts. In addition, the characteristics of teachers may differ depending on where they are teaching. Pre-k teachers in public schools have been found to be more educated, obtained higher wages, and were less likely to leave their job than pre-k teachers in non-public school settings (Bellm et al., 2002). Pre-k teachers who teach in public schools are also more likely to discuss their students with public school kindergarten teachers than are pre-k teachers in nonpublic settings, due to the close proximity of the staff to one another (Vecchiotti, 2003).

Program Length

Another important policy issue regarding pre-k is deciding on the program length. Early childhood education is costly because adult to child ratios are lower for preschool age children than elementary age children (Dwyer, Chait, & McKee, 2000). States may have to choose between providing more children with part-day pre-k or providing fewer, but needier, children with longer pre-k programs. During the 2000 to 2001 school year, 79% of states with pre-k programs chose to focus on the children who were most "at-risk" (Bryant et al., 2003). Approximately half of states with pre-k required that classes be held 5 days per week for 9 to 10 months per year. Some states have no requirements on program duration and leave program duration decisions to the local level (Bryant et al., 2003). The National Institute for Early Education Research's preschool summary report found that very few states operate on a year-round basis (Barnett et al., 2003). Even states that chose to focus on children at-risk vary in program length ranging from as short as 2.5 hr per day to as long as 10 hr per day (Bryant et al., 2003).

The wide variation in program length is likely to relate to the activities that take place in the classroom and other classroom characteristics. Although the field lacks research comparing full-day versus part-day preschools, the research on kindergartens finds that length of day matters. Children in full-day kindergarten classrooms, when compared with those in part-day rooms, were more likely to experience a richer repertoire of activities including dramatic play, science, art, music, social studies, and gross motor (Elicker & Mathur, 1997). Longer programs may allow teachers the flexibility to individualize instruction to match the children's needs and interests. Kindergarten children who attend full-day programs attain higher reading and

math achievement scores than children in part-day programs (Gullo, 2000). If this finding extends downward in age, then full-day pre-k is likely to be better than part-day programs. However, how much length of day matters depends on the quality of the program (Bowman, Donovan, & Burns, 2000; Peisner-Feinberg et al., 2001).

Teacher Education

States vary widely in the education level required to teach pre-k. Minimum requirements range from a child development associate (CDA) certificate to an associate's degree or, in some cases, a bachelor's degree (Bryant et al., 2003). Furthermore, some states require that the 2- or 4-year degree be in early childhood education or child development, whereas others do not specify a field of study. Barnett et al. (2003) found that most states require some specialized training in early childhood but how *specialized training* was defined varied widely across states. Furthermore, in-service training requirements ranged from no required in-service training each year to as many as 40 required clock hr per year (Barnett et al., 2003). Thus, pre-k children are being taught by teachers with varying amounts of training and education in early childhood education.

Teachers with more years of education and more specialized training in early childhood have been shown to have higher-quality, less authoritarian teaching practices (i.e., more elaborative, encouraging) than teachers with lower educational attainment (Arnett, 1989; Howes, 1997). Although states' minimum requirements vary, the trend is toward requiring teachers to have a 4-year degree. The National Research Council has recommended that a bachelor's degree be the standard (Bowman et al., 2000). Thus, it is important to understand how having a 4-year degree or not translates to differences in classroom characteristics and relates to the population of children being taught. In theory, children who are most at-risk should be placed in the classrooms taught by teachers with higher education to maximize the chances that these children will receive a high-quality experience that will lead to improved school readiness.

Research Issues

State-funded pre-k programs differ on design and policy parameters such as the populations served (at-risk population vs. universal access), program locations (public school building, non-public school building), teacher qualifications, and program intensity. Each of these features may affect costs and benefits. Despite the growth in state-sponsored early

childhood programs, little is known about features of program design or program quality. Naturally occurring variations in program design across states make it possible to compare and draw conclusions about the implications of these design decisions for program quality and for reaching the target population. This article describes the characteristics of children, families, and teachers served by state-supported pre-k programs and structural characteristics such as program eligibility, length of day, staffing, curricula, and location. It also examines the associations between program structure (location, teacher education, and program length) and characteristics of the classrooms, teachers, families, and children involved in state-supported pre-k.

Method

Participants

State selection process. Participating states were chosen not only for their well-established pre-k programs but also because they have taken somewhat different approaches to program standards. As a first step in selecting states to participate, we used existing information (e.g., Blank et al., 1999; Bryant et al., 2003) to learn which states had significant pre-k initiatives. Because of our interest in large-scale, well-established programs, we limited our pool of potential states to those that served 15%, or at least 15,000, of the state's 4-year-olds. This limited the pool of potential states to 19.

From those 19 states, 6 were selected for participation. They were purposefully selected to be diverse with regard to (a) length of program day, (b) teacher credentialing requirements, (c) program locales (in schools vs. in nonschool settings), and (d) geography. Only state programs that were interested in supporting the study and had data systems in place to allow for an adequate sampling of programs were selected. The programs selected were California's State Preschool Program and center-based Child Care and Development Program, the Georgia Pre-Kindergarten Program, the Illinois Pre-kindergarten Program for Children at Risk of Academic Failure, the Kentucky Preschool Program, New York's Experimental and Universal Pre-Kindergarten programs, and both Ohio's State-Funded Head Start Program and Public Preschool Program. Four of the states (California, Illinois, Kentucky, and Ohio) target their services specifically toward children considered at risk for academic problems, whereas Georgia is close to their goal of making pre-k available to all children whose families desire it during the year before kindergarten. New York has universal access for all 4-year-olds as a goal but initially gave preference to school districts with high propor-

tions of low-income families. In all of the states the program is voluntary for families. Prior to selection, the research team met with representatives from each state. These six states serve about half of all 4-year-olds in state pre-k programs in the United States (Barnett et al., 2003). Whereas the samples in two of the states were from subregions of the states (see the following), these regions were selected to be typical of pre-k programs in the state. Thus, although the sample is not representative of pre-k in the United States as a whole, it can be considered to reflect the status of programs in states with well-established pre-k services in the United States.

Site and child recruitment. In each of the 6 states, a stratified random sample of 40 state-funded pre-k sites was selected to participate in the study from a list of all sites in the state provided by the state education agency. Within each selected site, we worked with the center director or principal to randomly select one classroom for participation. The sample was stratified to maximize within-state diversity with regard to (a) programs in versus outside of school buildings, (b) full-day versus part-day classrooms, and (c) teachers with and without a bachelor's degree. A different sampling strategy was employed at the site and classroom level in each state to maximize within-state diversity on these three variables. This was needed because the natural distribution of these variables is different in each state.

Budget and time constraints prohibited us from randomly selecting from the entire states of California and New York. Instead, selection was limited to 20 sites in the greater Los Angeles area, 20 sites in California's Central Valley, 20 sites in the New York City area, and 20 sites within a 50-mile radius of Albany, New York. In the other four states, programs were randomly selected from the entire state.

Four children were randomly selected from each of the 240 randomly selected classrooms. In the fall of 2001, 238 pre-k classrooms and 935 children participated. Two additional classrooms agreed to participate during spring data collection. To obtain this sample of 240 sites, 335 sites were contacted. Initially, 40 sites were randomly selected in each state. Selected sites that were found to be ineligible or that declined to participate were replaced by another randomly selected site in the same strata and primary sampling unit. Of the 95 that were contacted 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. This response rate for schools (78%) was slightly higher than the school response rate from other large-scale studies including the Early Childhood Longitudinal Study (69%; NCES, 2000) and the Cost, Quality, and Outcomes Study (41%–68%

depending on state; Phillipsen, Burchinal, Howes, & Cryer, 1997).

We had limited information on which to compare sites that agreed to participate with those that declined. During sampling, five of the six state agencies provided information about program length (full-day or half-day) and location (in school or not in school) for all sites in their state. In those states, we can use that information to compare sites that agreed to participate with those that declined. The 6th state was not able to provide any site-level information, so no comparisons can be made. In the 5 states for which we have the needed information, the sample sites and the sites that declined were very similar in the length and location. In both the sample and the sites that declined participation, about 50% were half-day programs. In these 5 states, approximately 59% of the sample (unweighted) was located in schools compared to 60% of the sites that declined.

Within each site, one classroom was randomly selected to participate. Classroom selection was stratified to maximize variation in full-day versus part-day classrooms and lead teachers with and without a bachelor's degree. Eligible classrooms had to receive state funds. Of all randomly selected teachers, 16 teachers declined to participate (from 12 sites). Thus, of the randomly selected teachers, 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. Teachers were given \$100 in the fall and \$100 in the spring in appreciation of their participation.

The participating teachers helped the data collectors recruit children into the study by sending home with all children enrolled in the classroom recruitment packets containing (a) a consent form describing the study, (b) a family contact information sheet, and (c) a short demographic questionnaire. Parents returned these packets to the teacher. Teachers were given an additional \$20 if 75% of parents returned the consent, regardless of whether they agreed to participate.

On the first day of data collection, the data collectors determined which children were eligible to participate. Eligible children were those who (a) would be old enough for kindergarten in the fall of 2002, (b) did not have an Individualized Education Plan, according to the teacher, and (c) spoke English or Spanish well enough to understand simple instructions, according to the teacher. On average, 61% of parents of eligible children consented to have their child participate. Though we did not have information on parents who did not consent or did not return the consent form, we had information on classrooms with high and low consent response rates. Comparing classrooms with a high affirmative response rate of the parent consent (85% or higher; $n = 33$) to classrooms

with a lower response rate (40% or lower; $n = 45$) showed they did not significantly differ on percentage of Limited English Proficiency students, percentage of children receiving free or reduced lunch, Early Childhood Environment Rating Scale-Revised (ECERS-R) scores, or whether teachers had a bachelor's degree. Classrooms with a high response rate were more likely to have a higher percentage of White children in the class (56%) than did classrooms with a lower return rate (31%), $t(71) = 2.84$, $p < .01$. 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.

Procedure

In the fall and spring of the pre-k year, direct assessments of the children's language, preliteracy, and math skills were conducted, and extensive classroom observations were made. Data collectors were trained on all measures in a group training during the summer prior to data collection. After training they practiced the observations with their data collection partner in several preschool classrooms and practiced the child assessment with volunteer children. Before fall data collection, they met reliability criteria on the observational measures. Data collectors also videotaped themselves completing an assessment with a 4-year-old child. Each videotape was reviewed by a project supervisor who determined whether the data collector was following the assessment protocol. If the data collector did not follow the protocol, errors were noted on a 90-item checklist developed for the assessor certification, feedback was given to the data collector, practice prescribed, and another tape submitted until the standards were met. Only fall data are presented in this article.

Observational Measure of Process Quality

The ECERS-R (Harms, Clifford, & Cryer, 1998) was used to measure global classroom process quality. It comprises 43 items, 36 of which were used to calculate the overall process quality score. This study used a stricter rule for hygienic conditions with regard to toileting than previous studies have used. Therefore, the indicator Toileting was not included in computing composite ECERS-R score. As with most other research using the ECERS-R, the Parents and Staff subscale was not included in the overall ECERS-R score or in the factor scores. This is done because the child-related items are seen as measuring the classroom environment most directly affecting children.

In the original reliability studies for the ECERS, the percentage of agreement across the individual indicators in the scale is 86.1% within 1 point, with no item having an indicator agreement level below 70% (Harms et al., 1998). Each item is scored on a scale of 1 to 7 ranging from 1 (*poor*), 3 (*minimally acceptable*) 5 (*good*) and 7 (*excellent*). The total scale score is the mean item score for the room. The ECERS–R has been shown to relate to both structural measures of quality and child outcomes (Peisner-Feinberg et al., 2001; Phillipsen et al., 1997).

In addition to the ECERS–R total scale score, two factors were extracted via factor analysis with varimax rotation. The number of factors was identified by examining those with an eigenvalue greater than one and looking for the elbow point on a scree plot. Two factors emerged and items with loadings higher than .40 were considered as contributing to that factor. Factor 1, termed “Teaching and Interactions,” consisted of loadings from 11 individual items: Greeting/Departing, Encouraging Children to Communicate, Using Language to Develop Reasoning Skills, Informal Use of Language, Supervision of Gross Motor Activities, General Supervision of Children, Discipline, Staff–Child Interactions, Interactions among Children, Free Play, and Group Time. Factor 2, labeled “Provisions for Learning,” consisted of loadings from 12 items: Room Arrangement, Space for Privacy, Gross Motor Equipment, Fine Motor, Art, Blocks, Sand/Water, Dramatic Play, Nature/Science, Schedule, Free Play, and Group Time. The correlation between the two factors was 0.61, $p < .0001$. These two factors are similar to factors found in previous factor analytic studies of the ECERS (Clifford, Burchinal, Harms, Rossbach, & Lera, 1996; Rossbach, Clifford, & Harms, 1991).

In full-day classrooms, data collectors observed for the entire morning (from the start of class until nap) in the classroom. In part-day classes, they observed the entire class time. In addition to observing in the class, data collectors conducted a brief interview with the teacher to obtain information needed to score all items that were not observed (e.g., procedures for handling children who become sick during the day).

Prior to fall data collection, each data collector’s reliability on the ECERS–R was tested by one of two project staff who were experts in use of this measure.¹ Data collectors’ mean-weighted kappa with the expert trainer was .65 ($n = 22$) on their final test. On average, 83% of data collector responses were exact

matches or within 1 scale-point of the expert trainers’ responses.

Individual Child Assessment Measures

The child assessment battery was selected to provide a broad picture of the child’s emerging academic skills. The entire battery took between 45 min and 1 hr and was conducted during the school day, outside the classroom. Children who spoke a language other than English at home were given a portion of the Pre-Language Assessment Scale (Duncan & De Avila, 1998) to screen for English proficiency. Children who did not pass this screen ($\geq 80\%$ of items correct) and spoke Spanish at home were given a Spanish assessment battery ($n = 114$). Children who did not pass and spoke a language other than Spanish at home were not assessed at that time ($n = 6$). This article reports information from the English-language battery only ($n = 804$).

The first three instruments described in the following are standardized measures with national norms, a mean of 100 and standard deviation of 15.

Peabody Picture Vocabulary Test–3rd edition (PPVT–III) (Dunn & Dunn, 1997). The PPVT–III is an achievement test of receptive vocabulary that relates to other measures of language, literacy, and academic achievement (Chow & McBride-Chang, 2003; Dunn & Dunn, 1997). Children were shown a set of four pictures and were 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. According to the scale’s authors, the alpha coefficient of all the items on this scale ranges from .92 to .98 with a median reliability of .94, and test–retest reliability is reported as ranging from .85 to .90. Internal consistency (Cronbach’s alpha) for this sample was .95 in the fall.

Oral & Written Language Scale (OWLS, Oral Expression Scale; Carrow-Woolfolk, 1995). The OWLS Oral Expression Scale is a standardized measure designed to assess the understanding and use of spoken language. During the assessment, the examiner read aloud a verbal stimulus while the child looked at a stimulus board containing one or more pictures. Children were 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. The manual reports that test–retest reliability for the 4- to 5-year-old age range on the Oral Expression Scale is .86 and that correlations between the OWLS and achievement tests range from .44 to .89. Internal consistency (Cronbach’s alpha) for this sample was .91 in the fall.

¹One data collector was hired as data collection began. She was trained on the ECERS–R by project staff but established reliability with her data collection partner. Her partner had already established reliability with one of the project’s gold standards.

Woodcock–Johnson III Tests of Achievement: Applied Problems Subtest (Woodcock, McGrew, & Mather, 2001). The Woodcock–Johnson III Tests of Achievement are well-established standardized measures of academic achievement. The Applied Problems subtest examines the ability to analyze and solve math problems. The manual reports reliability coefficients for the 3- to 5-year-old age group from .92 to .94. Cronbach's alpha in the fall was .85.

Woodcock–Johnson III Tests of Achievement: Sound Awareness Subtest, Rhyming (Woodcock et al., 2001). The Rhyming task is a section from the Sound Awareness subtest and measures the ability to rhyme, a subcategory of phonological awareness. The pretest requires that children find two items that rhyme among a set of pictures. Subsequent test items ask children to name a word that rhymes with a test word presented by the assessor. The maximum possible raw score on this scale is 17. The reliability coefficients for the 4- to 5-year-old age group range from .71 to .85 according to the measures' authors. For this sample, internal consistency, Cronbach's alpha, was .86 in the fall.

Identifying Letters (NCEDL, 2001). This is a criterion-referenced measure of knowledge of the alphabetic characters used in English. The ability to identify letters is a key indicator of emergent literacy and is predictive of first-grade reading skills (Treiman, 2000). In this assessment, children were shown three cards, each with a set of mixed capital and lowercase letters. Children identified as many letters as they could. The highest possible score is 26. Cronbach's alpha estimate of internal consistency was .95 in the fall.

Identifying Numbers (NCEDL, 2001). This is a criterion-referenced measure of knowledge of the Arabic number symbols from 1 to 10. The ability to identify numbers is an indicator of emergent numeracy (Gelman & Gallistel, 1986). Children were shown a card with the numbers 1 to 10 arrayed randomly and asked to identify as many numbers as they could. The maximum possible score is 10. Cronbach's alpha estimate of internal consistency was .95 in the fall.

Counting (NCEDL, 2001). This is a criterion-referenced measure of the ability to count objects. The ability to identify numbers is an indicator of emergent numeracy (Gelman & Gallistel, 1986). In this task, children were asked to count and point, with a one-to-one correspondence, using a picture card with 20 teddy bears. If a child counted to 20 correctly, another sheet of bears was immediately presented for continued counting. The highest number the child counted in sequence was recorded, with a maximum

score of 40. Counting was significantly correlated with the Woodcock–Johnson Applied Problems standard score, $r(790) = 0.30, p < .0001$.

Color Bears (Head Start Family and Child Experiences Survey, 1998). A criterion-referenced measure, Color Bears measures the ability to name 10 basic colors. To assess color recognition and identification, children were shown a page of 10 different-colored bears and asked which colors they could name. They pointed to the bear as they named the color. The maximum score is 10. The ability to name colors was correlated with emergent reading skills such as receptive and expressive vocabulary. Scores on Color Bears were significantly correlated with scores on the PPVT-III, $r(749) = .24, p < .001$ and the OWLS, $r(746) = .22, p < .001$.

Teacher, Parent, and Administrator Questionnaires

Questions used on the teacher, parent, and administrator questionnaires were largely adapted from previously used questions from other large-scale surveys such as the U.S. Census and the National Institute of Child Health and Human Development Study of Early Child Care. In the fall, the teachers completed a questionnaire about themselves (e.g., teacher education, age, race/ethnicity) and their classrooms (e.g., enrollment, main curriculum) and one questionnaire about each of the study children in their rooms. All but one teacher returned the questionnaire about themselves; questionnaires were returned for all but four of the study children.

Parents (90% mothers) of all children in selected classrooms were asked to complete a short demographic questionnaire during the fall of pre-k when the consents were obtained. Classrooms averaged a 69% return rate on the questionnaire. Most families who completed the questionnaire also gave consent for their child to participate in the study. Families that did not give consent for their child to participate generally did not complete the questionnaire. To best describe the total population of children and families served in pre-k, data from all parent questionnaires is presented here, not only that of parents of children selected for the study. The number of parent questionnaires received was 2,928.

Direct supervisors (generally the school principal or program director) of each participating teacher were asked to complete a questionnaire about characteristics of their program including sources of funding, services provided (e.g., transportation, meals), goals, curriculum, and parent involvement. They also answered questions about themselves including demographic characteristics and beliefs about children. Some administrators were responsible for multiple

programs and therefore completed the questionnaire more than one time. In all, administrator questionnaires were completed for about 188 of the classrooms, representing 78% of participating classrooms. Classrooms where the administrator returned the questionnaire did not differ from classrooms where the administrator did not return the questionnaire in whether they were in or out of a public school building, whether full-day or half-day, or whether the teacher had a bachelor's degree.

Weighting

The sampling strategy was designed to represent the areas included in the study and oversampled for certain characteristics to ensure sufficient variation to examine questions related to program location, teacher education, and program length. Due to the stratification of the variables, we had to weight the data to be representative of the original population. After weighting, the reported means and their association of variation provided our best estimate of population values during the 2001–2002 school year for the geographic areas in the study. Except for data from the administrator questionnaires, all data have been weighted to represent the four states and each of the two regions in California and New York from which they were drawn.

Sampling weights were calculated at each stage in the sampling process (site, classroom, and child) to compensate for unequal probabilities of selection. Each weight is the inverse of the selection probability at that stage. The overall final child-level weights are the product of these three weights. The parent questionnaires have been weighted by first averaging data at the class level and then applying site-level weights. This process gives results that are adjusted for sampling methods so that the final figures are estimates of the full population of sites, classrooms, and children in the states (in the cases of New York and California, representative of the areas sampled in each state). These estimates keep the states equal with regard to size. States are not weighted on the basis of the number of classrooms in the state, thus the estimates do not reflect the differences in size between states.

RESULTS

What is the Population of Children and Families Being Served by Pre-k?

In describing the population of children and families being served by pre-k, family questionnaires from all of the children in the classes were collected. These data are presented in Table 1 together with data for the

families of the subset of children randomly selected to participate in the study. Differences in the states' criteria for pre-k are reflected in wide social, linguistic, and economic diversity of families receiving pre-k services. Boys were slightly more likely to participate in pre-k than girls.

A majority of parents reported their children's health to be generally good to excellent. In the prior year, most children were in some form of out-of-home care or education, though nearly a third were cared for exclusively at home (see Table 1). In comparing children 4 years of age and older with younger children, children 4 years of age and older were twice as likely to be in out-of-home care the previous year than younger children.

Defining *low-income* as family household income below 150% of the federal guideline, a significantly higher percentage of African American (50%), Latino (75%), and Asian (66%) children than White children (23%) attended a pre-k class with a high concentration of children from low-income backgrounds, $\chi^2(3) = 25.48, p < .0001$.²

What Are the Structural Characteristics of State-Funded Pre-k Programs?

Table 2 shows the descriptive data for structural characteristics. Although programs were generally funded through the state education agency³, only 47% were actually located within public school buildings. Overall, programs were relatively brief in length with more than half operating for less than 15 hr per week. Programs typically operated a 5-day week (61%). A substantial proportion (39%) served children 4 or fewer days per week. One state accounted for about half of the 4-day programs.

The age of pre-k children in the class ranged from 2 years, 10 months to 7 years, 7 months (as of October 1, 2001). In all, the teacher:child ratios were quite good. Average enrollment was 17.7 children with approximately 8 children enrolled per adult in the room. On average 53% of the children in each class came from families with incomes less than or equal to 150% of federal poverty guidelines. Teachers reported about 16% of children in their class were Limited English Proficient (LEP) and 6% of children in the class had an Individualized Education Plan at the start of the pre-k year. High/Scope (38%) and Creative Curriculum (19%) were reported as the most frequently used curricula by teachers, and only 4% indicated that they had no standard curriculum.

²High poverty classrooms were defined as classrooms with greater than 60% of children in the class being from families earning less than 150% of the federal poverty level for families of their size.

³Georgia funds their pre-k program directly from the State Office of School Readiness rather than through the local districts.

Table1. *Characteristics of Pre-kindergarten Children*

Child Characteristic	Nonselected + Selected Children			Selected Study Children ^a		
	Sample Size	Estimated Population Percentage	SE	Sample Size	Estimated Population Percentage	SE
Gender (%)	2,924			939		
Male	1,494	54.3	2.48	463	53.4	2.68
Female	1,430	45.7	4.49	476	46.6	2.68
Race/ethnicity (1%)	2,876			924		
Non-Latino White	1,212	42.8	4.43	375	34.6	3.53
Non-Latino African American	637	23.2	3.68	223	26.7	3.66
Latino	718	21.3	2.63	233	23.9	2.98
Asian/Pacific Islander	71	3.7	1.59	22	3.1	1.23
Native American	16	0.5	1.15	4	0.5	.34
Other/mixed	222	8.5	0.16	67	11.2	2.64
First language spoken by a child	2,928			935		
English	2,282	79.4	2.93	724	76.5	2.81
Spanish	501	14.3	1.84	163	17.1	2.18
English and Spanish	46	1.7	0.44	18	2.1	0.85
Other	99	4.6	1.62	30	4.3	1.37
Language(s) currently spoken at home	2,851			916		
English only	2,144	76.6	2.85	686	73.2	3.14
English and Spanish	346	11.0	1.38	124	14.0	2.38
Spanish only	246	7.7	1.49	70	8.2	1.54
Other	115	4.7	1.42	36	4.6	1.40
Parent rating of child's health	2,915			932		
Poor	2	0.02	0.01	0	0	0
Fair	64	1.9	0.38	15	1.9	0.67
Good	576	20.2	1.13	180	21.9	2.25
Very good	965	31.2	1.62	312	31.1	2.44
Excellent	1,308	46.6	2.16	425	45.1	2.43
Where were the children last year?	2,827			897		
Home with parent only	840	31.6	2.39	249	27.0	3.34
Same pre-school	701	22.4	1.63	247	22.2	2.60
Other preschool/center	569	18.3	1.05	73	9.3	1.76
Babysitter/care by relative	339	14.0	2.11	106	17.0	3.84
Head start	278	9.5	1.09	92	10.4	2.09
Family child care	100	4.1	0.88	27	3.4	0.91
Maternal education	2,855			918		
Less than high school	511	18.0	2.06	157	14.8	2.15
High school	692	24.1	2.04	207	24.9	4.38
High school plus some college	576	18.9	1.23	205	20.2	2.52
High school plus some technical certificate	485	16.4	1.25	156	15.2	2.38
Associate's degree	202	7.7	1.47	52	8.7	1.97
Bachelor's degree or higher	389	15.0	1.85	141	16.2	2.06
Annual family income	2,727			882		
\$5,000 or less	264	9.5	1.42	73	7.2	1.60
\$5,001–\$10,000	278	9.4	1.15	94	8.8	1.31
\$10,001–\$20,000	646	21.7	2.11	219	21.1	2.11
\$20,001–\$30,000	575	18.8	1.59	191	22.4	2.32
\$30,001–\$40,000	311	12.2	1.13	91	11.1	1.97
\$40,001–\$50,000	166	5.6	0.80	55	5.9	1.26
\$50,001–\$60,000	164	7.5	1.68	52	8.7	3.25
\$60,001–\$70,000	76	3.1	0.68	23	2.7	1.21
\$70,001 or more	247	12.2	2.41	84	12.1	1.90

^aData weighted to represent 211,059 children across six states.

Table 2. *Structural Characteristics of Pre-Kindergarten Programs^a*

Structural Characteristic	Sample Size of Classrooms	Estimated Population Percentage	Estimated Population Mean	SE	SD
Program location	238				
In school	130	46.7		5.90	
Not in school	108	53.3		5.90	
Program length: Number of hours served/week	230				
Less than or equal to 15 hr	109	51.3		4.90	
16–25 hr	17	6.1		1.87	
26–35 hr	68	30.1		3.66	
More than 35 hr	36	12.5		3.01	
Number of hours served/day	231		4.97	0.24	2.36
Number of days served/week	236		4.48	0.13	0.76
2	2	3.6		3.19	
3	2	5.8		5.52	
4	73	30.1		5.24	
5	159	60.6		6.24	
Classroom structure					
Number of children enrolled in a class	227		17.73	0.30	3.60
Number of children enrolled per observed staff	226		8.15	0.16	1.97
Number of children present per staff member	224		7.05	0.15	1.91
Youngest child served on 10/01/2001	2,912		2y, 10m		
Oldest child served on 10/01/2001	2,912		7y, 7m		
Percent of children in class that are poor	238	53.3		3.60	
Percent of children in class with an IEP	217	5.6		0.90	
Percent of LEP children	208	15.9		2.40	
Curriculum reported by the teacher	234				
High/scope	81	37.9		5.99	
Creative	37	18.9		4.79	
State developed	26	8.6		1.92	
Locally developed	27	14.3		5.58	
No curriculum	17	3.8		1.38	
Other	46	16.5		3.40	
Teacher trained on curriculum used in classroom	224				
Yes	181	80.3		6.24	
No	43	19.7		6.24	
Services offered by the program (% yes)	188				
Special services for children with special needs	173	92.0		3.69	
Developmental assessments	176	87.2		6.36	
Meals for children	167	82.3		6.36	
Parenting education or family literacy	162	78.1		11.69	
Transportation	111	63.5		7.46	
Health care or social services offered collaboratively by service agencies such as hospitals	101	58.4		8.40	
After-school care	70	40.2		7.69	
On-site family case workers	89	38.4		7.51	
Extended care (summer or holiday)	75	36.0		7.15	
Before-school care	48	28.1		6.99	
Classroom quality: ECERS–R: overall	227		3.86	0.07	0.77
ECERS–R: teaching and interactions			4.52	0.14	1.21
ECERS–R: provisions for learning			3.74	0.10	0.90

Note: IEP = Individualized education plan; LEP = Limited english proficiency; ECERS–R = Early Childhood Environment Rating Scale–Revised.

^aData weighted to represent 17,147 classrooms across six states.

Table 3. *Characteristics of Pre-kindergarten Teachers^a*

Teacher Characteristic	Sample Size	Estimated Population Percentage	Estimated Population Mean	SE	SD
Gender					
Female	23	98.0		1.15	
Age (years)	224		41.88	1.04	10.10
Race/ethnicity	236				
Non-Latino White	146	62.0		5.41	
Non-Latino African American	41	16.6		3.67	
Latino	28	9.7		2.71	
Asian/Pacific Islander	10	3.4		1.34	
Other/mixed	12	8.3		3.4	
Educational background	237				
High school plus some training	53	16.4		2.97	
Associate's or 2-year degree	43	15.4		2.96	
Bachelor's degree	80	38.5		5.87	
Master's degree	61	29.8		6.16	
Have CDA	70	23.1		4.06	
Teachers with a BA and certification to teach 4-year-olds	112	50.52		6.09	
Language spoken by teacher in classroom	236				
English	153	69.4		4.82	
English and Spanish	71	27.0		4.65	
English and other	12	3.6		1.40	
Hourly wage	193		\$19.23	1.60	10.60
Under \$10 per hr (%)	38	13.2		6.30	
Between \$10 and \$20 per hr	92	34.7		6.43	
Between \$20 and \$30 per hr	42	33.9		6.73	
More than \$30 per hr	25	18.2		3.41	
Average number of months per year salary covers	203		10.61	1.27	1.23
Average number of hr/week paid	204		37.06	10.34	8.56

Note: CDA = Child development associate.

^aData weighted to represent 17,006 teachers across six states.

According to program administrators, at least 80% of programs provided services for children with special needs, conducted developmental assessments of children, and provided meals for children. Between 50% and 79% of programs offered parenting education or family literacy programs, transportation, and health care or social services, sometimes offered collaboratively with other agencies. Less than half provided on-site family case workers, before- or after-school care, or summer or extended year (summer and holiday) care.

Who Is Teaching Pre-k?

Characteristics of the lead teachers in state-funded pre-k programs are detailed in Table 3. The teachers were mostly White, overwhelmingly female, and on average were about 42 years old. Nearly 70% had at least a bachelor's degree, and almost 30% held a master's degree. Some (15%) had a 2-year degree, and 16% had no formal degree past high school. Almost a quarter had a CDA credential. We estimated that

about half (51%) of pre-k teachers attained a bachelor's degree with certification to teach 4-year-olds. All teachers spoke English in the classroom; however, many spoke Spanish in class in addition to English (27%), and a few (4%) spoke some other language in addition to English. Teachers were given the option to complete their annual salary or their hourly wage and were asked how many months of the year the salary covered and how many total work hours per week they are paid. Annual salaries were converted to hourly wage based on the number of months and hours teacher reported working. The average wage was \$19.23 per hr and \$33,770 per year (range = \$11,500–\$81,546), although 13% earned less than \$10 per hr.

What Is the Classroom Quality in Pre-k?

The overall mean score on the ECERS–R was 3.86 (see Table 2). Few classes (11%) scored in the inadequate range (< 3) but equally few classes (8%) scored

Table 4. *Fall Scores of English-Speaking Pre-kindergarten Children^a*

Child Assessment	Sample Size	Estimated Population Mean	SE	SD	Range	25th Percentile	75th Percentile
Measure							
PPVT	804	92.65	1.14	15.05	62–117	85.81	101.64
OWLS	789	91.07	1.15	13.05	68–119	83.93	98.52
WJ-III: Applied problems	790	97.23	0.80	13.75	70–117	90.48	103.15
WJ-III: Sound awareness	223	1.49	0.15	2.25	0–11	0.38	1.92
Naming letters	803	8.02	0.55	8.79	0–25	2.74	11.36
Naming numbers	803	4.19	0.23	3.87	0–10	2.51	5.67
Naming colors	804	8.67	0.12	2.37	1–10	7.70	9.52
Counting	790	12.58	0.46	7.87	2–34	9.41	16.32

Note: PPVT = Peabody Picture Vocabulary Test; OWLS = Oral & Written Language Scale; WJ-III = Woodcock–Johnson III Tests.

^aPopulation means and percentiles are weighted to represent 211,059 children across six states.

in the good-to-excellent range (5–7); most were clustered in the minimal (3–5) range (81%).

Mean scores on the two ECERS–R factors were 4.52 for Teaching and Interactions, which includes ratings of staff–child interactions, discipline, supervision, encouraging children to communicate, and using language to develop reasoning skills, and 3.74 for Provisions for Learning, which includes ratings of furnishings, room arrangement, gross motor equipment, art, blocks, dramatic play, and nature–science.

What Emergent Literacy and Numeracy Skills Do Pre-kindergartners Have at the Beginning of Pre-k?

In Table 4 we present information about the literacy and numeracy skills of English-speaking pre-k children in the fall of pre-k. Because the majority of states in the study target children based on some measure of risk for school failure, it is not surprising that these pre-kindergartners scored below age norms. In particular, the two language measures (PPVT-III and OWLS) were about half a standard deviation below the national means. Numeracy scores were only slightly below national average. Although national norms are not available for the skills of naming letters, numbers, colors, or counting, children showed quite a range on these tasks. On average, they could name 8 letters, 4 numbers, and nearly all of the colors. In addition, on average they could count to 13 with one-to-one correspondence. Their sound awareness skills were, on average, just emerging: Only 28% of children could pass the pretest items on the Sound Awareness Subtest of the Woodcock–Johnson. Those who passed the pretest items averaged less than two correct answers to test items.

Variations in Pre-K Programs by Structural Features

We examined the relation between structural features of pre-k programs (location, teacher education, and program length) and characteristics of the population being served. All of the weighted chi-squares and weighted analyses of variance controlled for state differences by entering state as a categorical covariate in all the analyses. Data are weighted to represent 17,147 classrooms across the six states.

Location. Whether a pre-k program was located in a public school building was associated with the characteristics of the teachers staffing these programs. Pre-k teachers in public school buildings differed from pre-k teachers in other types of settings. About 81% of pre-k teachers in public schools reported having a bachelor's degree or higher, and only 8% reported no college degree. This compares to 57% of teachers in non-public school settings with a BA or higher and 24% with no college degree (see Table 5). Post hoc tests revealed that pre-k teachers in public school settings were more likely to have a 4-year degree. Consistent with their education level, teachers in public school buildings were paid significantly more than teachers in other types of settings. Table 5 summarizes these results. Location of program was not related to the characteristics of children, families, or classrooms. It is important to note that there were no differences in child assessment scores, poverty concentrations in the class, or teacher-reported class curriculum.

Program length (full-day/part-day). We defined a full-day program as one that served children more than 20 hr per week and part-day programs as

Table 5. Variations by Location of Pre-kindergarten Program

Program Characteristic	Sample Size	In School ^a	Not in School ^b	Significance Test
Teacher educational background (%)	237			$\chi^2(3) = 11.23^*$
High school plus some training	53	7.6	24.0	
Associate's or 2-year degree	43	10.8	19.3	
Bachelor's degree	80	30.2	45.7	
Master's degree	61	51.3	11.0	
Post hoc comparison: High school vs. Bachelor's degree and above				$\chi^2(1) = 6.76^{**}$
Post hoc comparison: Associate's degree vs. Bachelor's degree and above				$\chi^2 = 5.23^*$
Mean hourly wage	193	\$26.30	\$13.40	$F(1, 127) = 71.38^{***}, d = .81$
Program length: hr per day	230	4.48	5.34	$F(1, 127) = 0.26, n.s.$

^aWeighted % = 46.7. ^bWeighted % = 53.3.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

Table 6. Variations by Program Length

Program Characteristic	Sample Size	Full-Day ^a	Part-Day ^b	Significance Test
Curriculum reported	234			$\chi^2(5) = 22.37^{***}$
High/scope	81	51.1	20.3	
Creative	37	14.6	23.7	
State-developed	23	3.6	13.7	
Locally developed	27	2.4	25.3	
No curriculum	17	0.1	7.2	
Other	46	28.4	9.8	
Percent of children in class that are poor	238	63.0	47.0	$F(1, 127) = 6.12^*, d = 2.0$
Race/ethnicity of children in class (mean %)	895			$\chi^2(5) = 18.67^{**}$
Non-Latino White	372	37.2	33.5	
Non-Latino African American	215	39.2	13.1	
Latino	217	15.3	34.8	
Asian/Pacific Islander	22	1.4	5.4	
Other/mixed	69	6.9	13.2	

^aWeighted % = 43.3. ^bWeighted % = 56.7.

* $p < .05$. ** $p < .01$. *** $p < .001$.

ones that served 20 hr or less per week. In considering program characteristics by program length, significant differences were found in classroom characteristics and the population of children and families served (see Table 6). Full-day teachers were much more likely to report using High/Scope or "other" curricula as compared with part-day. Part-day teachers were more likely to use Creative, state- or locally developed curricula, or no curriculum.

Part-day and full-day classrooms also differed in the population of children and families they served. Full-day classrooms had a higher proportion of children from low-income backgrounds. Race-ethnicity makeup of the class significantly differed by length of day. Full-day classes had a higher proportion of African American children, whereas part-day classes had a higher proportion of Latino children

Teacher education (bachelor's degree or higher vs. no bachelor's degree). Significant differences were found between classrooms taught by teachers

with and without bachelor's degrees (see Table 7). Teachers with a bachelor's were more likely to be White and less likely to be African American or Latino than teachers without a bachelor's degree. Teachers without a bachelor's degree were teaching significantly more children—and higher proportions of children—from low-income backgrounds compared to teachers with a bachelor's degree.

Differences were also found in regard to the level of skills of the pre-k children who entered the teachers' classes. Multivariate analyses⁴ tested whether children differed on language measures (PPVT, OWLS), prereading measures (Naming Letter, Woodcock-Johnson Sound Awareness Subtest), and numeracy-math measures (Woodcock-Johnson Applied Problems Subtest, Naming Numbers, and Counting). When multivariate analyses were significant, follow-up univariate analyses were conducted. The findings indicate that teachers with a bachelor's degree

⁴Multivariate tests could only be conducted on unweighted data.

Table 7. *Variations by Teacher Education*

Program Characteristic	Sample Size	Teacher BA ^a	Teacher No BA ^b	Significance Test
Race/ethnicity of teacher				$\chi^2(3) = 17.92^*$
Non-Latino White	145	75.9	49.9	
Non-Latino African American	41	13.4	28.8	
Latino	28	70.2	18.1	
Asian/Pacific Islander	9	3.5	3.3	
Post hoc comparison: Non-Latino White vs. Non-Latino African American				$\chi^2(1) = 13.01^{**}$
Post hoc comparison: Non-Latino White vs. Latino				$\chi^2(1) = 16.06^{**}$
Mean hourly wage of teacher	204	\$22.20	\$13.20	$F(1, 127) = 28.2^{***}, d = .81$
Percent of children in class that are poor	238	48.0	65.0	$F(1, 127) = 12.79^*, d = 2.13$
Child assessment				
Multivariate test (language measures)	804			$\Lambda = .93, F(2, 221) = 7.78^{**}$
PPVT	804	94.3	89.1	$F(1, 127) = 16.63^{***}, d = .34$
OWLS	789	92.1	88.1	$F(1, 127) = 15.26^{**}, d = .23$
Multivariate test (numeracy measures)	790			$\Lambda = .99, F(3, 221) = 2.45, n.s.$
Multivariate test (prereading measures)	223			$\Lambda = .97, F(2, 221) = 0.88, n.s.$

Note: PPVT = Peabody Picture Vocabulary Test; OWLS = Oral & Written Language Scale.

^aWeighted % = 68.2. ^bWeighted % = 31.8.

* $p < .01$. ** $p < .001$. *** $p < .0001$.

taught pre-k children who scored higher on receptive vocabulary and expressive vocabulary at the beginning of pre-k than teachers without a bachelor's degree. No significant differences were found in children's prereading scores or scores on numeracy–math measures.

Discussion

The vow that “by the year 2000, all children in America will start school ready to learn” (National Governors' Association, 1990, p. 16) increased the national spotlight on school readiness and has increased state involvement in the provision of early childhood education programs. Understanding the implications of policy decisions regarding the population of children served, classroom location, program length, and teacher characteristics is critical as states continue to implement and expand pre-k programs. Though the parent consent response rate of classrooms was higher in predominantly White classrooms than in those that were predominantly African American and Latino, we believe the data from this study provide a reasonably accurate profile of program characteristics, family and child characteristics, structural features, and their relation across established pre-k programs in 6 states. Although these programs met the standards proposed for structural features of early childhood programs by the National Association for the Education of Young Children (NAEYC, 1996), they varied considerably in teacher and classroom attributes and program quality. Although this sample seems limited, the 6 states studied serve more than half of all 4-year-old children in

state pre-k programs in the United States (Barnett et al., 2003).

Structural Features

In state-funded pre-k in these states, teacher:child ratios were 1:8 with an average class size of 18. This is within NAEYC accreditation standards of a 1:10 adult:child ratio and maximum class size of 20 for 3- and 4-year-old classrooms (NAEYC, 1998). All classrooms in the study met the 1:10 ratio and only 14% exceeded the maximum class size recommendation of 20. NAEYC also recommends that early childhood teachers hold at least a CDA and preferably a bachelor's degree or higher in an early childhood related topic. A report from the National Research Council calls for a bachelor's degree to be the standard for pre-k (Bowman et al., 2000). The findings from this study suggest that the pre-k teacher with a bachelor's degree or higher is becoming the norm in these state-funded pre-k programs, with about 68% of teachers holding at least a bachelor's degrees. For those teachers that have a bachelor's degree or higher, 74% had certification to teach early childhood. In comparison, it is estimated that 33% of teachers in Head Start have a bachelor's degree or higher (Administration on Children, Youth and Families [ACYF], 2001), and 22% of teachers in Head Start have a bachelor's degree or higher in early childhood education related areas (ACYF, 2002).

The average compensation received by teachers in this population is higher than has been observed in other studies and is likely due to the higher education levels of teachers in public school settings. In 2001,

Head Start teachers averaged about \$22,000 (or \$15–\$17 per hr) per year (ACYF, 2002) compared to this study's finding that pre-k teachers average about \$22 per hr. However, pre-k teachers in this study who taught classes located outside of public schools averaged about the same salary (approximately \$15 per hr) as Head Start teachers (ACYF, 2002). A bachelor's degree or higher is more common in pre-k programs located in and possibly influenced by the culture of an elementary school or school building. It is also likely that pre-k teachers in public school based programs benefit from the higher compensation scales that are in effect for elementary school teachers. A previous national study of state-funded pre-k programs found that 82% of school-based pre-k teachers are paid using the same pay scale as the rest of the school (National Center for Education Statistics, 2003).

The finding that slightly more than half of pre-k programs are located off public school grounds and outside of the public school culture under contractual arrangements with community-based organizations suggests that these arrangements may prove to be cost-effective alternatives when classrooms are not available in buildings already owned by the schools. With this approach also comes a lack of control over achieving the same level of standards achieved in the school setting.

Program length often represents a strategic decision to provide access to more students than would be possible if the program operated for longer days or more days or to hold down program costs. These trade-offs raise questions about how much is minimally needed to benefit children. The majority of pre-k programs across the geographic regions in the study are part-time and typically run 2 to 5 hr per day for 4 or 5 days each week. There is some evidence that full-day kindergarten programs are more effective than part-day programs for children 1 year older than the children we studied in pre-k (Elicker & Mathur, 1997). In addition, part-day programs may complicate the lives of children and their working parents. When parents work outside of the home, they need to augment part day pre-k programs with other sources of child care if they are not provided through the program (Garrett, Wagner, Lubeck, & Clifford, 1990). Most program administrators in this study (60%) reported no after-school or extended care options. In addition to the inconvenience for parents, it is possible that moving from program to program may have negative consequences for the children themselves.

Differences were found in classroom characteristics between part-day and full-day programs. Part-day programs were less likely to use a curriculum, with about 7% of part-day classrooms using no curriculum. In addition, a large proportion of teachers of part-day programs (about 14%) reported using a state-developed curriculum. However, the early childhood state specialists in each state's education agency reported to us

that no state-developed curricula existed, so it appears that teachers must sometimes consider state standards or courses of study to be curricula. In any case, most of the programs had some overall guiding principles for the program. The majority of programs reported either High/Scope or Creative as their curriculum. Full-day programs were also more likely to have poor children. Clearly, program length has many concomitants and should not be purely interpreted as a dosage indicator.

Race–Ethnicity and Language of Children and Teachers

In spite of the fact that four of the six states studied are targeted solely to at-risk children, the population served in pre-k programs in the states was quite diverse ethnically, economically, and linguistically. A somewhat higher percentage of pre-k children are African American or Latino than in the 4-year-old population at large. This is probably attributable to the fact that these children are more likely to fall among high-risk children as a consequence of poverty.

The population of pre-k teachers is relatively representative of the U.S. population in terms of race and ethnicity (Grieco & Cassidy, 2001) but is not nearly as diverse as the population of children in the programs. The population of pre-k teachers across these four states and two regions is comparable to the U.S. population, with only slightly more African American teachers and slightly fewer Latino teachers. The race–ethnicity composition of pre-k students is quite different from teachers. Pre-k children are about twice as likely to be African American or Latino than their teachers, with African American children and Latino children comprising 44% of the pre-k student population. Thus the teacher population in these states is not nearly as diverse as the population of children and families served in the pre-k programs.

The proportion of LEP children in public schools has increased 105% over the past decade and continues to increase (Kindler, 2002). Nationally, LEP children comprise 12% of the elementary school population, with earlier grades (K–3) having more LEP children than later grades (4–6) (Kindler, 2002). This study also found that a large proportion of pre-k children (16%) were considered by teachers to be LEP. Moreover, the average hides the fact that many programs were populated by all or nearly all non-English-speaking children. Dealing with a population of children diverse both ethnically and racially and in terms of their dominant language is one of the major challenges that will face programs as they expand.

Poverty, Race, and Ethnicity

The finding that most classes with a high concentration of poor children also were classes that were pre-

dominantly African American or Latino illustrates the difficult task of disentangling race and ethnicity from socioeconomic backgrounds. Most states that have implemented pre-k (including four of the states in this study) have programs targeted for children at risk for later academic problems. Providing pre-k to children at risk is often viewed as a means of closing the achievement gap that exists between poor and non-poor children, as well as between White children and children of other racial backgrounds.

One striking finding of this study was that poor children were more likely to be taught by teachers with lower qualifications (e.g., less than a bachelor's degree). In essence, the children most in need of high-quality early childhood experiences are being taught by the less-qualified teachers. Though this is true for all levels of education (Stover, 1998), it is particularly distressing to find this in pre-k programs that are specifically designed for children at risk. The degree to which this is an impediment to meeting the goal of having every child ready for kindergarten at school entry will be examined in subsequent analyses of the data from this study. It is certainly possible that the differences noted here may contribute to the persistent gaps in achievement that are evident as children enter kindergarten.

Classroom Quality

Classroom process quality was lower than would be anticipated given the relatively high program standards (i.e., ratio, class size, teacher education) described above. The average ECERS-R score of 3.86 was lower than what has been found in other large-scale studies of early childhood programs. The Cost, Quality, and Outcomes study (Peisner-Feinberg et al., 1999) and the Head Start Family and Child Experiences Survey (ACYF, 2001, 2003), both large-scale studies of early childhood programs, found slightly higher ECERS scores in their programs. Two reasons may underlie this difference. First, unlike the Cost, Quality, and Outcomes study or the 1997 cohort in the Family and Child Experiences Survey (FACES), this study utilized a revised version of the ECERS. The revised version includes specific items about diversity, math, and science, all of which may lower overall scores. However, the 2000 cohort in the FACES study used the revised version of the ECERS and still found slightly higher scores in their programs (ACYF, 2003). Further study is needed to make adequate comparisons of program quality across these major categories of programs. Second, this study included a large number of part-day programs. Routine activities (meals, toileting) take nearly the same amount of time in part-day and full-day programs, leaving less discretionary time. It is difficult to get high scores on many ECERS items without a large amount of discretionary time. This topic will be explored in future reports using these

data. Further study is needed to make adequate comparisons of program quality across these major categories of programs.

In sum, we believe that over the next 10 years, public investment in the education of young children will continue to increase, particularly for children at risk for academic problems in the early school years. Eventually, public school will begin for most children at age 3 or 4. Pre-k, in many ways, is at a crossroads, caught between early child care programs, Head Start, and schools. Much of the variability that is seen across programs appears to stem from some programs using a school-based (K-3) model in pre-k and other programs using a modified child care model (Bryant et al., 2003). It is likely that this maps onto some classrooms using more teacher-initiated activities and other classrooms using a more child-centered approach (Lonigan, 2003; Marcon, 2002). How these different models of pre-k affect children's development and transition into kindergarten will be explored in subsequent reports using this data set.

Key challenges for national and state policy makers and local practitioners include decisions about (a) whether to provide pre-k programs, (b) to whom such programs should be available, (c) how the services should be financed, (d) what the goals of these programs are, and (e) what models and practices should be used (Bryant et al., 2003). The findings from this study illuminate the importance of understanding the needs of an ethnically, linguistically, and economically diverse population of children and families. Moreover, the findings that structural features of programs related to classroom, teacher, and child characteristics suggest that there may be unintended consequences of seemingly straightforward policy decisions. Subsequent analyses of data from this study will help to shed light on the issues raised in this article, including the relationship of child outcomes to the variables described here and the degree to which quality as measured here continues to be predictive of child outcomes as it has in previous work on child care and related programs. Clearly, there is substantial variation in program characteristics, even in programs largely governed by set standards at the state level. This article demonstrates this variation and raises questions about the importance of these key policy variables in reaching the goals of these programs.

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