

# Early School Transitions and the Social Behavior of Children with Disabilities: Selected Findings from the Pre-Elementary Education Longitudinal Study

Wave 3 Overview Report from the  
Pre-Elementary Education Longitudinal Study (PEELS)

# **Early School Transitions and the Social Behavior of Children with Disabilities: Selected Findings From the Pre-Elementary Education Longitudinal Study**

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## Executive Summary

The Pre-Elementary Education Longitudinal Study (PEELS), funded by the U.S. Department of Education, is examining the characteristics of children receiving preschool special education, the services they receive, their transitions across educational levels, and their performance over time on assessments of academic and adaptive skills. PEELS includes a nationally representative sample of 3,104 children with disabilities who were 3 through 5 years of age when the study began in 2003-04. The children will be followed through 2009.

This report provides selected findings from the first three waves of data collection—school year 2003-04, school year 2004-05, and school year 2005-06. Any reported differences have been tested for statistical significance at the  $p < .05$  level. These data were collected through several different instruments and activities, including a direct<sup>1</sup> one-on-one assessment of the children, a telephone interview with the children's parents/guardians, and mail questionnaires to the teacher or service provider of each child.

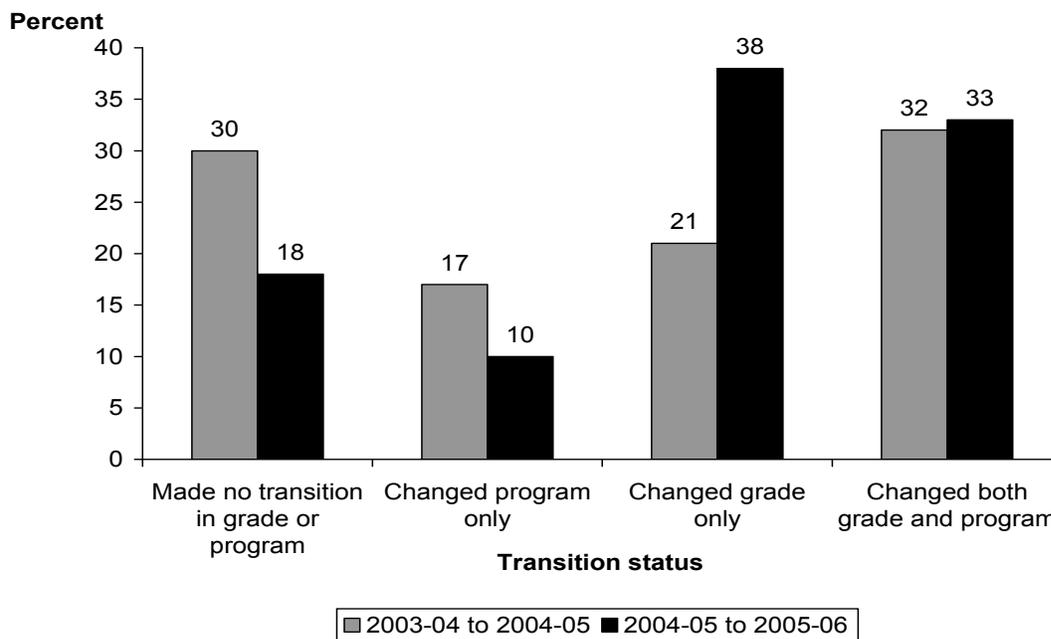
### Transitions Among Young Children With Disabilities

- Between 2003-04 and 2004-05, 70 percent of children made a transition to a new program, grade, or school. Between 2004-05 and 2005-06, a total of 82 percent of children made a transition to a new program, grade, or school. Thirty-three percent underwent a change in both program (such as moving from one school to another) and grade (such as moving from preschool to kindergarten or kindergarten to first grade) between 2004-05 and 2005-06 (see figure A).
- Seven percent of children who made no grade transition, 12 percent of children who transitioned from preschool to kindergarten, and 31 percent of children who transitioned from kindergarten to first grade had not received tutoring in 2003-04, but did receive tutoring in 2004-05.
- Transitions are a time when changes in eligibility for services can occur. Twenty percent of children who transitioned from preschool to kindergarten were declassified (i.e., children who were receiving special education services but were no longer eligible) between 2003-04 and 2004-05, and 21 percent were declassified between 2004-05 and 2005-06. In contrast, of children who did not undergo a transition, 5 percent of children were declassified between 2003-04 and 2004-05; between 2004-05 and 2005-06, that figure was 9 percent (see table A).
- Data from children's transitions to kindergarten were combined across the 3 years of the PEELS study in order to explore this transition period. Based on teacher report, there were no statistically significant differences in the ease with which children transitioned to kindergarten by gender, race/ethnicity, household income, or primary disability. There were some statistically significant differences based on parent report of the ease of children's transition to kindergarten by demographics, however. For example, parents of Hispanic children were more likely than parents of Black or White children to report a *somewhat hard* or *very hard* transition to kindergarten (26%, 16%, and 13%, respectively).

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<sup>1</sup> In Wave 3, the direct assessment included the following subtests: preLAS Simon Says, and Art Show; Peabody Picture Vocabulary Test (PPVT); Woodcock-Johnson III: Letter-Word Identification, Applied Problems, and Quantitative Concepts; Leiter-R Attention Sustained; IGDI Picture Naming, Alliteration, Rhyming, and Segment Blending; and PIAT-R Reading Comprehension.

**Figure A. Percentage of young children who received preschool special education services during the 2003-04 school year: Transition status by year**



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Elementary School Teacher Questionnaire,” “Kindergarten Teacher Questionnaire,” “Early Childhood Teacher Questionnaire,” and “Parent interview,” previously unpublished tabulation (February 2007).

- The support and involvement of schools in the process of transitioning to kindergarten was significantly associated with how easy the transition was perceived to be by parents and teachers. For example, 87 percent of parents and 86 percent of teachers reported that the transition was *somewhat* or *very easy* when the school initiated support to facilitate the transition across the 3 years of the PEELS study.
- Teachers were asked to indicate which of 11 specified strategies were used to help facilitate the child’s transition to kindergarten. Across the 3 years of the PEELS study, strategies that were used by over 80 percent of teachers included receiving the child’s records from his or her previous program (87%), encouraging parents and guardians to meet the child’s new staff (86%), and receiving information about the child from his/her previous program (83%).
- For the combined kindergarten data, children who attended kindergarten in the same location as they had attended preschool had teachers who reported significantly higher use of multiple transition strategies than children who had attended some other program or had been at home: receiving children’s previous records (91% compared to 85%), the previous program providing information about the child (90% compared to 79%), someone from the current program meeting with staff of the sending program (68% compared to 50%), and someone from the program visiting the child’s previous setting (62% compared to 31%). Teachers were significantly more likely to use more strategies when children transitioned from a preschool program within the same school compared to those who came from a different

school (see table A). When children transitioned from a preschool program within the same school, on average, teachers reported using six strategies, whereas teachers reported using five strategies when children came from a different school.

**Table A. Percentage of young children who received preschool special education services whose kindergarten teachers used various strategies to help them transition into kindergarten, by characteristics of the setting**

	<b>Total</b>	Preschool class in same school	Some other program or at home
Received children's previous records	87.1	91.0	85.0*
Parents/guardians encouraged to meet new staff	86.3	88.2	82.8
Sending programs provided information about children	82.8	89.6	78.5*
Children's families visited the classroom or school	78.6	80.7	77.5
Provided parents with written information	75.0	76.8	73.7
Participated in children's IEP development	63.3	65.7	59.6
Met with staff of sending programs	58.8	67.5	49.7*
Called the children's parents	54.8	51.8	54.0
Developed child-specific preparatory strategies	53.7	53.4	52.3
Visited children's previous settings	43.1	62.4	31.0*
Visited children's home	10.3	16.6	7.6

\*The result of the chi-square analysis was significant at the  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

- Previous research indicated a positive correlation between the number of strategies that teachers use and transition outcomes (Schulting, Malone, and Dodge 2005). Across the 3 years, kindergarten teachers used, on average, five strategies to facilitate the child's transition to kindergarten. However, the number of strategies used by kindergarten teachers varied significantly by district size, metropolitan status, and district wealth. Forty percent of teachers who worked in very large districts, compared to 58 percent of teachers who worked in medium districts, used six or more strategies to facilitate transitions. Thirty-two percent of teachers who worked in very low wealth districts used six or more strategies compared to 52 percent of teachers who worked in high wealth districts (see table B).
- Across the 3 years of the study, PEELS kindergarten teachers who were special educators used, on average, significantly more transition strategies than regular education classroom teachers. Special educators, on average, reported using six strategies, whereas regular education teachers, on average, reported using five strategies.

**Table B. Percentage of young children who received preschool special education services and the number of supports used by their kindergarten teachers during the transition to kindergarten, by district factors**

	0 or 1 support	2 or 3 supports	4 or 5 supports	6 or more supports
<b>Total</b>	7.3	21.6	22.7	48.4
District size*				
Very large	10.5	29.3	20.6	39.7
Large	10.5	24.2	20.1	45.2
Medium	4.3	18.4	19.7	57.6
Small	5.4	16.9	28.8	49.0
Metropolitan status*				
Urban	10.8	26.2	18.8	44.1
Suburban	6.7	20.7	22.5	50.2
Rural	3.9	17.1	28.4	50.6
District wealth*				
High	4.5	16.9	26.4	52.2
Medium	4.0	16.8	21.7	57.4
Low	8.6	25.4	19.8	46.3
Very low	14.8	30.4	22.4	32.4

\*The result of the chi-square analysis was significant at the  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

### **Social Behavior of Young Children With Disabilities**

- The Social Skills and Problem Behaviors Scales from the Social Skills Rating System (SSRS) (Gresham and Elliott 1990) were included in the PEELS teacher questionnaires in school year 2005-06. The SSRS is a standardized measure with a mean of 100 and standard deviation of 15 and has separate norms for males and females. The SSRS was standardized by age and gender. High scores on the Social Skills Scale indicate enhanced social skills, whereas high scores on the Problem Behaviors Scale indicate more problem behaviors. The mean scores on the Social Skills Scale were 94.1 for males and 93.1 for females. On the Problem Behaviors Scale, mean scores were 102.9 for males and 103.5 for females. The mean ratings did not differ significantly by gender.
- For all three years of data collection, parents were asked a number of questions about their children's social skills and behavior. Parents' reports changed significantly for some of their children's social skills and behaviors, generally in the direction of improved social skills and fewer behavior problems. The percentage of parents who reported that their children were not at all aggressive increased significantly, from 43 percent in 2003-04 to 52 percent in 2005-06, and the percentage of parents who reported that their children's behavior was age appropriate increased significantly, from 58 percent in 2003-04 to 61 percent in 2005-06.

- The correlation between parents' perceptions and teachers' ratings of their children's social skills was statistically significant for males ( $r = 0.12$ ) but not for females ( $r = 0.06$ ). The correlation between parents' perceptions and teachers' ratings on problem behaviors was statistically significant for both males ( $r = -0.39$ ) and females ( $r = -0.52$ ).
- Declassification status was significantly related to children's SSRS scores. The mean scores for males who had an IEP for all 3 years of the study ( $M = 92.8$ ) were significantly lower on the Social Skills Scale than scores for males who were declassified between 2003-04 and 2004-05 ( $M = 100.1$ ) and males who were declassified between 2004-05 and 2005-06 ( $M = 99.6$ ). The mean scores for females who had an IEP all 3 years ( $M = 91.0$ ) were significantly lower compared to females who were declassified between 2003-04 and 2004-05 ( $M = 101.5$ ) and females declassified between 2004-05 and 2005-06 ( $M = 99.9$ ). Males with IEPs for all three years of the study ( $M = 103.8$ ) had higher scores on the Problem Behaviors Scale (i.e., more problem behaviors) than males who were declassified between 2003-04 and 2004-05 ( $M = 99.3$ ) and males who were declassified between 2004-05 and 2005-06 ( $M = 98.8$ ). There were no statistically detectable differences on the Problem Behaviors Scale by declassification status for females.

## Chapter 1: Introduction

In spring 2006, researchers completed the third wave of data collection for the Pre-Elementary Education Longitudinal Study (PEELS). PEELS is funded by the U.S. Department of Education's National Center for Special Education Research (NCSEER) to examine the preschool and early elementary school experiences and performance of children with disabilities. The study will follow a nationally representative sample of children until 2009; the children were identified as having disabilities when they entered the study in 2003-04. Five broad descriptive research questions guide the data collection, analysis, and reporting for this multiyear study.

- What are the characteristics of children receiving preschool special education?
- What preschool programs and services do they receive?
- What are their transitions like—between early intervention and preschool and between preschool and elementary school?
- How do these children function and perform in preschool, kindergarten, and early elementary school?
- Which child, service, and program characteristics are associated with children's performance over time on assessments of academic and adaptive skills?

A few key points are critical for understanding the data in this report.

- PEELS draws on a national sample of children who were 3 through 5 years of age and were identified as having disabilities when they entered the study. The sample was selected by age, not by grade, so the children are in different grades. Prior to 3 years of age, the children may or may not have received early intervention services through Part C of the *Individuals with Disabilities Education Act (IDEA)*.
- The data in this report were weighted.<sup>2</sup> Therefore, estimates apply to all children with disabilities 3 through 5 years of age in the United States, not the sample of participating children.

Chapter 2 describes the study design and methods. Chapter 3 addresses transition issues, including the type of transitions children experienced, transition support strategies used by teachers, ease of transition, and changes in services and disability classification at transition points. Data on more than 2,500 children who transitioned to kindergarten are available to address these critical transition topics.

In Chapter 4, several aspects of the children's social skills and behaviors are examined using data from parent interviews and teacher reports. The data allow for a comparison of teachers' and parents' perceptions of children's social skills and behavior as well as a comparison of children currently identified as having disabilities and children who were previously identified but are no longer eligible for special education services.

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<sup>2</sup> Sample weights were used to derive population estimates from the sample. To generate the weighted estimates, sample data were multiplied by the appropriate weight, which reflected the probability of being sampled. For more complete information, see Lee, H., Carlson, E., Lo, A., Fan, J., Chen, L., and Klein, S. (2004). *Final Methodology Report* (Deliverable 13.2 under Contract # ED-01-CO-0082). Rockville, MD: Westat, available at [www.peels.org](http://www.peels.org).

There are also seven appendices to this report. Appendix A contains a diagram of Local Education Agency (LEA) sampling procedures. Appendix B provides detailed information on weighting procedures used in PEELS. Appendix C contains the results of a nonresponse bias study. Appendices D and E include standard errors for data tables and figures, respectively. Appendix F provides the number of children who had various test accommodations by gender, race/ethnicity, cohort, and disability category. Appendix G provides a description of all analytic variables used in this report. Appendix H provides the number of LEAs in the final augmented sample and relationships between the three stratification variables of district size, region, and wealth.

As Wave 4 and Wave 5 data become available, PEELS researchers will expand upon the findings in this report and address how children's services, transitions, and outcomes continue to change over time. For more information on PEELS results, please go to [www.peels.org](http://www.peels.org) and review the reports posted there.

## Chapter 2: Methods

PEELS is designed to describe children 3 through 5 years of age with disabilities and the services they receive, what their transitions are like from early intervention to preschool and preschool to elementary school, and their performance in preschool, kindergarten, and elementary school. This chapter provides basic information on the sample design, data collection instruments and activities, and data analyses.

### Sample Design

PEELS used a two-stage sample design to obtain a nationally representative sample of 3- through 5-year-olds receiving special education services. In the first stage, a national sample of LEAs was selected. In the second stage, a sample of preschoolers with disabilities was selected from lists of eligible children provided by the participating LEAs.<sup>3</sup>

Different samples are referred to throughout the chapter, so it may be helpful to define them clearly from the outset. The sample selected following the original sample design is called the main sample. This sample was selected by a two-stage design, LEAs at the first stage and children at the second stage. To address nonresponse bias at the LEA level, a nonresponse bias study sample was selected from the nonparticipating LEAs to examine potential differences between the respondents and nonrespondents.<sup>4</sup> The combined sample of the main and the nonresponse study sample is a three-phase sample, where the first phase is the same as the main sample, the second phase is a combined LEA sample comprising the main sample LEAs and the nonresponse study sample LEAs, and the third phase is the sample of children selected from the combined LEA sample. This combined sample was treated as one sample, as if it had been selected with the original sample design and is called the amalgamated sample. In Wave 2, a supplemental sample was selected from a state that was not covered in Wave 1. The amalgamated sample was augmented by adding the supplemental sample and is named the augmented sample. The results presented in this report are based on this augmented sample.

### Main LEA Sample

In 2001, a total of 2,752 LEAs were selected from the universe of LEAs serving preschoolers with disabilities, although the target sample size was 210. The universe of LEAs was stratified by four Census regions, four categories of estimated preschool special education enrollment size, and four wealth classes defined on the basis of district poverty level. This resulted in 64 cross-classified stratum cells. The sample of 2,752 LEAs was then divided into many subsamples. Releasing these subsamples one by one, the contractor recruited from the minimum number of subsamples possible to secure participation from 210 LEAs, the target number needed to generate a sufficient number of children in the second stage sample. Ultimately, 709 LEAs were contacted during recruitment, and 245 LEAs agreed to participate. However, a state that contains a considerable portion of the population for its region banned its districts from participating in the study, so they were not even contacted for recruitment. This created a serious under-coverage problem for the study population. This undercoverage was resolved in Wave 2 by randomly selecting a supplemental sample for the state. More details on the supplemental sample are given later in this chapter.

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<sup>3</sup> In this report, the terms LEA and district are used interchangeably.

<sup>4</sup> Details about the nonresponse study can be found in appendix C.

The design contractor contacted directors of special education and superintendents to secure districts' participation. A participating LEA was required to return a signed agreement affirming that the district would complete the following tasks:

- Provide one or more names and contact information for a potential site coordinator for the study;
- Allow the site coordinator and other cooperating district staff to recruit families into the study;
- Forward contact information from parents who consented to participate in the study;
- Allow selected teachers, other service providers, and principals of sampled children to complete a mail questionnaire; and
- Allow selected children to participate in a direct assessment, with parental consent.

The design contractor focused recruitment efforts on very large LEAs because a large proportion of the child sample would be selected from these districts, and smaller LEAs could be replaced.<sup>5</sup> Because the initial recruitment occurred in 2001, and data collection did not begin until 2003, researchers contacted the participating LEAs to confirm their willingness to participate.

In spring 2003, a total of 46 of the 245 LEAs recruited in 2001 dropped out of the study. The 199 remaining LEAs confirmed their participation and began to supply lists of preschool children receiving special education services.

Nonparticipation of a large state in the first phase of LEA recruitment in 2001 created serious undercoverage<sup>6</sup> for the region in which the state is located (This nonparticipating state is referred to as state X). Moreover, a large district in the same region as state X was 1 of the 46 that dropped out in 2003.<sup>7</sup> By spring 2003, the state education agency (SEA) in state X lifted the ban and allowed its districts to participate in the study, and researchers tried to replace the large district that dropped out by sampling four large LEAs from state X in the hope of reducing the undercoverage.<sup>8</sup> Only one of those four LEAs agreed to participate in PEELS, and recruitment of children from the district was very low; therefore, the undercoverage was largely unresolved.

To address this undercoverage so the final sample would be nationally representative, a supplemental sample of LEAs, with stratification by size, was randomly selected from state X in Wave 2 (2004-05)—it was too late to do this in Wave 1. The Wave 1 sample, despite the undercoverage problem,

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<sup>5</sup> There are very few large LEAs, particularly in certain regions of the country. In contrast, there are many small LEAs. Particular attention was given to recruiting large LEAs, since smaller LEAs were in greater supply. If the target number of participating small LEAs was not met, additional LEAs (chosen at random within the defined sampling strata) could be recruited.

<sup>6</sup> Undercoverage by a sample indicates that a certain portion of the survey population has no chance of being selected. Because of a state ban, the LEAs in one state had no chance of being selected into the PEELS sample, so it created an undercoverage problem.

<sup>7</sup> This dropout worsened the response rate among the selected LEAs in the region but did not aggravate the undercoverage problem.

<sup>8</sup> Although having some sample from the nonparticipating state reduced the undercoverage problem, it did not eliminate the problem, because there were still many LEAs that did not have any chance of being selected.

was weighted as if state X had been covered by the sample, in the hope of obtaining reasonable national estimates, despite the risk of possible bias. In this way, researchers produced preliminary Wave 1 data.

In Wave 2, the supplemental sample provided data for state X, and researchers used imputation to create missing Wave 1 data for the supplemental sample based on Wave 2 data. All data (child assessment, teacher questionnaire, and parent/guardian interview) except principal and program director questionnaire data were imputed for the supplemental sample in Wave 1. Six percent of the augmented sample data for Wave 1 are imputed data, including assessment data. The Wave 1 sample was then reweighted. Therefore, the Wave 1 (2003-04) point estimates and standard errors presented in this report will differ from the preliminary Wave 1 results presented in a previous publication (Markowitz et al. 2006).

In Wave 1, among the contacted 709 LEAs, only 199 LEAs participated in the study. Poor response raised a concern about nonresponse bias. To address it, the U.S. Department of Education funded a comprehensive nonresponse study. In Wave 1, a random sample of 32 LEAs was selected from among the 464 nonparticipating LEAs originally contacted but unsuccessfully recruited. Note that the state ban was still in effect at the time of selection of the nonresponse bias sample, so it was not feasible to include that state in the nonresponse bias study. Because the LEA sample for the nonresponse bias study was small compared to the main LEA sample, it was not possible to use the original LEA sample design (i.e., stratified by geographic region, size category, wealth class)<sup>9</sup>, and so only size was used to stratify the 464 nonparticipating LEAs to select the random sample of 32.<sup>10</sup> Twenty-five of those LEAs (78%) initially agreed to participate in the study. This nonresponse study sample was roughly 10 percent of the size of the main LEA sample. Because the results of the nonresponse bias study showed no systematic differences between the respondents and nonrespondents for the key variables studied (see appendix C for details), the two samples (main and nonresponse bias study) were amalgamated into a single sample as if they had been selected as one based on the original sample design. Nevertheless, this amalgamation could cause some unknown bias in estimates.

This amalgamated sample was then augmented by adding the supplemental sample; this report is based on this augmented sample. Thus, Wave 1 data from the supplemental sample were included in all analyses in this report. The augmented sample, although not selected using the original sample design, is nationally representative because the supplemental sample eliminated the undercoverage issue, and weighting of this sample was done to produce nationally representative estimates.

A diagram<sup>11</sup> in appendix A depicts the sample selection processes for the main sample, which was stratified by size, region, and wealth class, and the nonresponse bias and supplemental samples, both of which were stratified by size only. The final result of the augmented LEA sample, which includes the nonresponse bias study and supplemental samples, is shown by stratum variables (of the main sample) in table 1. See appendix H for additional tables, including LEA sample size by region, region by district wealth, and district wealth by size.

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<sup>9</sup> If the original sample design was used for the nonresponse bias study, at least half of the 64 possible stratum cells would have been allocated a sample size of zero. This would have created a serious coverage problem because the strata for which no sample was allocated would have had no chance of selection. Using the same stratification is not an issue of representativeness (i.e., coverage) but of efficiency. The notion of sample representativeness is used here to mean that the sample is designed to give every unit in the survey population (represented by the sampling frame) a non-zero probability of selection.

<sup>10</sup> This sample (10 percent of the main LEA sample (245 districts) and with full participation in all aspects of data collection) was considered quite comprehensive to study bias due to nonresponse. To maintain the 64 initial sampling strata, the nonresponse sample would have required resources beyond those available or required for the sample's purposes.

<sup>11</sup> The diagram does not show the intermediary sample of 2,752 LEAs from which a random sample of 709 LEAs was used because the unused portion was simply a reserve sample, which was put back to the frame.

**Table 1. Final augmented LEA sample size by three stratification variables**

Size				
Total	Very Large	Large	Medium	Small
232	39	42	51	100
Region				
	Northeast	Southeast	Central	West/Southwest
232	66	56	63	47
District wealth				
	High	Medium	Low	Very low
232	67	67	59	39

<sup>1</sup> Note: The supplemental sample is included only in one region. Region was not used as a stratification factor for the nonresponse bias sample, but the counts include nonresponse bias sample LEAs that happened to fall in the respective regions.

<sup>2</sup> Note: Wealth class was not used as a stratification factor for either the nonresponse bias sample or the supplemental sample, but the counts include their sample LEAs that happened to fall in the respective classes.

### **Child Sample**

In Wave 1, participating districts in the LEA sample submitted lists of eligible children from which the sample of children was selected. The first was a historical list that asked districts to identify age-eligible children who had an individualized education program (IEP) prior to March 1, 2003 (or an individualized family service plan [IFSP] for districts using IFSPs for children 3 through 5 years of age), see table 2 for age-eligibility. The second set of lists, called ongoing lists, were submitted monthly for 1 year and asked districts to identify newly eligible children in the district by listing children who received their first IEP in the given month. Districts identified children using numbers, rather than names, to maintain confidentiality. Children who transferred from another district with an IEP already in effect were not included on the ongoing lists because they were not newly eligible children.

In Wave 1, the lists of child identification numbers submitted by the districts were checked for ineligible or duplicate cases within and across lists. Errors were corrected through communication with district site coordinators. PEELS researchers began randomly selecting children from historical and ongoing lists late in the 2002-03 school year.<sup>12</sup> The districts continued to send lists of children once a month as the children entered the special education system, and researchers continued to select additional children for the site coordinators to recruit. By the end of Wave 1 family recruitment in May 2004, researchers had selected a sample of 5,259 children.

There are three age cohorts in PEELS: Cohort A comprises 3-year-olds, Cohort B 4-year-olds, and Cohort C 5-year-olds, defined in table 2. Cohort A consists of children in the specified age range who were newly enrolled in the special education program during the recruitment period, and they were to be sampled as they enrolled. These children were on the “ongoing” lists. Cohort B consists of children in the eligible age range who were enrolled before the recruitment period (“historical”) and children who were newly enrolled (i.e., ongoing). Cohort C also consists of historical and ongoing children. Thus, there were

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<sup>12</sup> Sampling rates were based on district-level enrollment counts for children 3 through 5 years of age with disabilities.

five combinations of age cohort and historical-ongoing status for each district. These combinations are called child sampling classes.

**Table 2. Definition of PEELS age cohorts**

Cohort	Age at entry into PEELS	Date of birth
A	3 years old	3/1/00 through 2/28/01
B	4 years old	3/1/99 through 2/29/00
C	5 years old	3/1/98 through 2/28/99

Historical list children were sampled using predetermined sampling rates based on the estimated list size and the target sample size, as explained below, when the participating districts provided their historical lists of 4- and 5-year-old children. Children on the ongoing lists were sampled as the districts periodically sent lists of 3-, 4-, and 5-year-olds. Each district had a predetermined sampling rate, which was typically used throughout the recruitment period. However, in some cases, the sampling rates were recalculated based on updated information on district enrollment size, if it was very different from the original estimate.

To determine the sampling rates for the five child sampling classes in the main sample, district-level sampling weights and district-level child counts, by cohort, were used. The historical sampling rates were generally lower than the ongoing sampling rates within a cohort. Both rates were determined to achieve the target sample sizes for the five child sampling classes, while keeping the weights within the child sampling classes as equal as possible. District child counts were obtained from SEA personnel or websites. Most of the child counts were from December 2003; some were older. Similarly, for the nonresponse bias study sample, the cohort sampling rates were determined in order to reach the target sample sizes (10% of the main sample) and to obtain homogeneous child weights within the child sampling classes as much as possible.

One constraint to this procedure was a cap of 80 children for each district. This cap was set so that no individual districts would be overburdened. Although the cap was considered in determining the sampling rates, researchers nonetheless surpassed the cap in a few instances during ongoing sample selection because some large districts submitted lists that included more children than predicted. During ongoing sample selection in each month, PEELS staff monitored the situation. When the cap was exceeded for a district by a margin of more than 5, the ongoing sample selected for the district that month was reselected so that the overall sample size did not exceed 80, and no further ongoing sample selection was performed for the district.<sup>13</sup>

For the supplemental sample selected in Wave 2, a similar sampling procedure was used to select a child sample, with important exceptions. The age cohort was determined based on the children's age in Wave 1 (see table 2). Furthermore, there was no need to select children on an on-going basis because, in Wave 2, every child was from a historical list. However, to mirror the child sampling process used in Wave 1, the ongoing and historical designations were assigned based on the time of the children's special education enrollment in 2003-04. An additional sample of 542 children was added to the child sample of 5,259 selected in Wave 1, totaling 5,801 sampled children, of whom 3,104 were recruited and took part in the study (2,906 beginning in Wave 1, and 198 beginning in Wave 2).

<sup>13</sup> The overall district sample size was allowed to exceed the cap of 80 by up to 5.

## **Family Recruitment**

Once children were sampled from the historical or ongoing lists, Recruitment Packets were sent to the district site coordinators. Site coordinators were district employees responsible for determining if sampled children were eligible and, if so, inviting their parents or guardians to participate in PEELS. It was necessary to use district employees for this purpose because of the confidentiality of the data on sampled children (i.e., that they were children with disabilities receiving special education services). In addition, district employees had access to information about the names and addresses of parent/guardians and service providers that would not have been available to nonemployees. While some family recruitment began in summer 2003, it began in earnest in fall 2003. Recruitment for the supplemental sample occurred in winter-spring 2005. Each recruitment packet included Enrollment Forms (Part 1 and Part 2), a PEELS brochure, a cover letter explaining the study, a PEELS magnet, and a postage-paid return envelope.

Each recruitment packet was arranged according to the unique PEELS identification number assigned to each sampled child. Site coordinators from each district were given a recruitment log, which listed each child's PEELS identification number along with the child's district identification number (submitted on the historical/ongoing lists). Site coordinators were asked to match the identification numbers on the log with the proper child, apply eligibility standards, then invite the eligible families to participate in PEELS. Site coordinators were also encouraged to document the recruitment process using the log.

Part 1 of the PEELS Enrollment Form was eight questions long and was typically filled out by the district's site coordinator before inviting the family to participate in the study. The following five questions on the form asked site coordinators for nonidentifying information for each child sampled:

1. Is the child of Hispanic origin?
2. Child's race?
3. Is the child in foster care?
4. Does the family receive any kind of public assistance?
5. Primary reason for child's eligibility in preschool special education?

PEELS researchers collected these data to test for differences between families that agreed and those that declined to participate in PEELS. The remaining three questions on the Enrollment Form were used to determine the eligibility of each family selected. PEELS had three eligibility criteria:

1. There was an English- or Spanish-speaking adult or an adult who used signed communication in the household who could respond to the telephone interview or alternatively respond using a telephone relay service or interpreter for the hearing impaired.
2. This was the first child in the family sampled for PEELS.
3. The sampled child's family resided in the participating school district at the time of enrollment in PEELS.

If all three eligibility criteria were met, families were given recruitment materials, including a letter explaining the study, the PEELS brochure, and a magnet. The site coordinator informed the family

that PEELS is a longitudinal study, that participation is voluntary, and that they could drop out at any time. Site coordinators stressed the study’s commitment to confidentiality, ensuring the family that their identity would be protected and that only aggregate data would be reported.

Families that agreed to participate were asked to fill out the PEELS Enrollment Form, Part 2, which asked for identifying information such as names, contact information, the type of services the child received, and the name of the child’s teacher or service provider. Once they submitted a signed consent form agreeing to allow PEELS staff to conduct the parent telephone interview, the child assessment, and the teacher/service provider questionnaire, parents received \$15. Site coordinators were paid \$30 for each family they recruited.

As site coordinators enrolled families to participate in PEELS, their cases were released for the various data collection activities, including the parent telephone interview, the child assessment, and the teacher and program administrator questionnaires.

PEELS researchers received completed enrollment forms for 4,365 children, including the supplemental sample. Based on those enrollment forms, 3,902, or 89.4 percent of families were found eligible. Of those found ineligible, 74 percent no longer lived in the district from which they were sampled; 12 percent did not have an English- or Spanish-speaking adult in the home; and 12 percent had another child sampled for PEELS. Of the eligible families, 79.5 percent agreed to participate. In all, 3,104 families took part in PEELS, which is lower than the 3,550 families anticipated, potentially leading to nonresponse bias. However, the nonresponse bias study revealed no systematic differences between respondents and nonrespondents (see appendix C for details). Also, the set of final recruited families was properly weighted to produce national estimates. Details of the weighting procedure are given in appendix B. (For information on the characteristics of recruited and nonrecruited families, see Carlson 2004).

Nine districts out of 232 that agreed to participate in the study did not recruit any families with eligible children or had no eligible children, and so the final tally of the participating districts in the child-base surveys is 223.<sup>14</sup> See appendix H for tables including participating LEA sample size by size of LEA, region, and wealth. This final sample result is tabulated by stratification variables and cohort in tables 3 through 5. Tables 6 and 7 provide final child samples by disability and gender, respectively.

**Table 3. The final study sample of children, by size of LEA**

	Total number of children	Very large	Large	Medium	Small
<b>Total</b>	3,104	736	851	729	788
Cohort A	986	226	257	238	265
Cohort B	1,125	300	325	252	248
Cohort C	993	210	269	239	275

<sup>14</sup> Child-base surveys are the parent interview, child assessment, and teacher questionnaires. Some of those districts, nevertheless, participated in the LEA questionnaire.

**Table 4. The final study sample of children, by LEA region**

	Total number of children	Northeast	Southeast	Central	West/ Southwest
<b>Total</b>	3,104	756	727	658	963
Cohort A	986	287	177	210	312
Cohort B	1,125	260	288	226	351
Cohort C	993	209	262	222	300

**Table 5. The final study sample of districts and children, by LEA wealth**

	Total number of children	High	Medium	Low	Very low
<b>Total</b>	3,104	848	856	796	604
Cohort A	986	291	296	223	176
Cohort B	1,125	302	306	272	245
Cohort C	993	255	254	301	183

**Table 6. The final study sample of children, by disability**

	Total number of children	AU	DD	ED	LD	MR	OI	OHI	SLI	LI	No current IEP
<b>Total</b>	3,104	188	806	44	73	86	43	56	1,562	150	96
Cohort A	986	72	328	13	9	23	15	20	443	49	13
Cohort B	1,125	75	280	12	22	30	18	16	590	52	29
Cohort C	993	41	198	19	42	33	10	20	529	49	54

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence.

All children were eligible for special education services at the time of recruitment, but by the time of the 2003-04 data collection, some of these children no longer had an IEP or IFSP.

**Table 7. The final study sample of children, by gender**

	Total number of children	Male	Female
<b>Total</b>	3,104	2,189	915
Cohort A	986	692	293
Cohort B	1,125	802	322
Cohort C	993	695	300

## Data Collection Instruments and Activities

The PEELS design calls for five waves of data collection during the 6 years from 2003-04 to 2008-09, including several different instruments and activities. As shown in table 8, each of Waves 1 through 4 included a telephone interview with the participating children's parents/guardians, direct one-

on-one assessment of participating children, and mail questionnaires to the teacher or service provider of each child. A final child assessment is planned for Wave 5. Additionally, questionnaires were mailed to SEA, LEA, and program/school administrators to obtain contextual information.

**Table 8. PEELS data collection schedule**

	Wave 1 2003-04	Wave 2 2004-05	Wave 3 2005-06	Wave 4 2006-07	Wave 5 2007-08 2008-09
Parent/guardian interview	X	X	X	X	
Child assessment	X	X	X	X	X
SEA questionnaire	X				
LEA questionnaire	X	X			
Principal/program director questionnaire	X	X	X		
Teacher questionnaire	X	X	X	X	

NOTE: LEA questionnaires for only the supplemental sample were conducted in Wave 2. In Waves 2 and 3, principal/program director questionnaires were sent only to schools/programs enrolling PEELS children for the first time.

PEELS staff traced children who moved out of the school district that originally enrolled their families, and these children were reassigned to nearby assessors. In Wave 3, there were 476 families living outside of their original districts; 85 percent completed a Wave 3 direct or alternate assessment.

Table 9 provides response rates for each of the data collection instruments in each wave.

### ***Parent/Guardian Interview***

A parent/guardian of each child in the sample was asked to complete four computer-assisted telephone interviews (CATI), one in each of Waves 1-4. The interviews covered the participating child's health and disability, behavior, school programs and services, special education and related services, child care, and out-of-school activities. Respondents were also asked a series of questions about their household, its resources, and family background.

Parent interviews for Wave 1 were conducted between November 2003 and June 2004. Wave 2 and Wave 3 interviews were conducted between January and June of 2005 and 2006, respectively. Parent interviews averaged about 60 minutes. The interviews were conducted in English or Spanish, based upon respondent preference. In Wave 1, interviews were conducted with 2,802 families, for a 96 percent response rate out of the recruited families.<sup>15</sup> In Wave 2, interviews were conducted with 2,893 families, for a 93 percent response rate. In Wave 3, a total of 2,719 families completed interviews (88%). Because 198 families in the supplemental sample were added in Wave 2 to the families recruited in Wave 1, the number of families interviewed in Wave 2 and 3 may be higher than in Wave 1, while the percentage interviewed may have decreased or remained unchanged.

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<sup>15</sup> The response rate for each instrument of data collection (parent telephone interview, child assessment, and teacher questionnaire) is calculated out of the recruited families in its specific wave.

**Table 9. Total number of respondents for each PEELS instrument**

Instrument type	Wave 1		Wave 2		Wave 3	
	Frequency	Response rate (%)	Frequency	Response rate (%)	Frequency	Response rate (%)
Parent interview	2,802	96	2,893	93	2,719	88
LEA questionnaire	207	84	--	--	--	--
SEA questionnaire	51	100	--	--	--	--
Principal/program director questionnaire <sup>a</sup>	852	72	665	77	406	56
Teacher mail questionnaire	2,287	79	2,591	84	2,514	81
Early childhood teacher questionnaire	2,018	79	1,320	86	346	82
Kindergarten teacher questionnaire	269	73	957	79	992	81
Elementary teacher questionnaire	--	--	314	86	1,176	81
Child assessment	2,794	96	2,932	94	2,891	93
English/Spanish direct assessment	2,463	97	2,704	96	2,726	93
Alternate assessment only	331	93	228	79	165	93

--Not available

<sup>a</sup> QED data were used to supplement information from the principal/program director questionnaires, bringing the percentage of children with some school context information in Waves 1, 2, and 3 to 94 percent, 95 percent, and 94 percent, respectively.

### **Child Assessment**

The direct one-on-one assessment was designed to obtain information on the knowledge and skills of preschoolers with disabilities. Child outcome measures were selected based on a number of criteria: their ability to yield individual scores, acceptable reliability and validity studies, brevity, norms in the age ranges under consideration, and maximum opportunity for inclusion of all participating children. In several cases, priority was given to assessments being used in the Head Start National Reporting System and Head Start Impact Study ([www.acf.hhs.gov/programs/opre/hs/impact\\_study/index.html](http://www.acf.hhs.gov/programs/opre/hs/impact_study/index.html)). The direct assessment in each wave averaged 40 minutes and included one or more of the following subtests:

- preLAS 2000 Simon Says (Duncan and De Avila 1998);
- preLAS 2000 Art Show (Duncan and De Avila 1998);
- Peabody Picture Vocabulary Test (Dunn and Dunn 1997);
- Woodcock-Johnson III: Letter-Word Identification (Woodcock, McGrew, and Mather 2001);
- Woodcock-Johnson III: Quantitative Concepts (Woodcock, McGrew, and Mather 2001);

- Woodcock-Johnson III: Applied Problems (Woodcock, McGrew, and Mather 2001);
- Leiter-R Attention Sustained Scale (Roid and Miller 1995, 1997);
- Individual Growth and Development Indicators: Picture Naming (ECRI MGD 2001);
- Individual Growth and Development Indicators: Alliteration (ECRI MGD 2001);
- Test of Early Math Skills (US DHHS 2005);
- Individual Growth and Development Indicators: Rhyming (ECRI MGD 2001);
- Individual Growth and Development Indicators: Segment Blending (ECRI MGD 2004); and
- PIAT-R Reading Comprehension (Markwardt 1989).

More than 400 assessors were employed and trained to administer the one-on-one assessment with participating children. The assessors included school psychologists, teachers, administrators, and other individuals experienced in administering standardized assessments to young children with disabilities. Some were employees of participating districts. Others were retired or employed by neighboring education agencies or health care providers. The assessors were hired based on their experience in administering standardized assessments to young children with disabilities, and, in many cases, they had experience administering the PEELS assessments themselves, for example, PPVT and Woodcock-Johnson tests of achievement. While using local assessors could potentially threaten the objectivity of the test results, this staffing structure facilitated access to the children and their families, which would have been difficult to obtain using non-local assessors.

Based on specific information from a screening interview with the child's teacher, service provider, or parent/guardian, the assessors were responsible for determining which assessment the child would be given—direct or alternate—and if the child should be referred to a bilingual assessor. An alternate assessment was given if the child could not follow simple directions, had a visual impairment that would interfere with test administration, or if the child began the direct assessment but could not meaningfully participate (e.g., could not attend to the task or did not respond correctly to any items in the first few tests). Assessors also determined if test accommodations were needed based on short interviews with teachers, service providers, or parents. Arrangements for assessments were scheduled with early childhood education programs, elementary schools, teachers, special educators, and parents.

Building on their previous professional experience, PEELS assessors received an initial 1-1/2 day in-person training that was conducted at several locations around the country and was supplemented with video-based instruction on test procedures. The administrative procedures associated with PEELS assessments were explained during the in-person training, and the assessors practiced each subtest following the protocol prescribed for PEELS. Returning assessors completed only video-based training, while replacement assessors received both in-person and video-based instruction.

Assessors were supervised by one of nine Regional Supervisors, who were responsible for recruiting, hiring, and supervising PEELS assessors. During the data collection period, assessors were required to speak with their Supervisors on a bi-weekly basis. These calls were used for answering assessor's questions, conducting any necessary retraining, and case tracking.

In Wave 1, a direct or alternate assessment was completed for 96 percent of the participating children (84% direct, 12% alternate). In Wave 2, a direct or alternate assessment was completed for 94 percent of participating children (87% direct, 7% alternate). In Wave 3, 93 percent of children completed an assessment (88% direct, 5% alternate). Table 10 provides a list of assessments given in each wave and to each age cohort.

**Table 10. Child assessment subtests**

Subtest	Wave 1			Wave 2			Wave 3		
	A	B	C	A	B	C	A	B	C
preLAS Simon Says	x	x	x	x	x	x	x	x	x
preLAS Art Show	x	x	x	x	x	x	x	x	x
Peabody Picture Vocabulary (PPVT)	x	x	x	x	x	x	x	x	x
Woodcock-Johnson III: Letter-Word Identification	x	x	x	x	x	x	x	x	x
Woodcock-Johnson III Quantitative Concepts			x		x	x	x	x	x
Woodcock-Johnson III: Applied Problems	x	x	x	x	x	x	x	x	x
Leiter- R Attention Sustained (Test Item AS 1-4)	x								
Leiter- R Attention Sustained (Test Item AS 5-8)		x	x	x	x		x		
Leiter- R Attention Sustained (Test Item AS 9-12)						x		x	x
IGDI Picture Naming	x	x	x	x	x	x	x	x	x
IGDI Alliteration		x	x	x	x	x	x	x	x
IGDI Rhyming		x	x	x	x	x	x	x	x
IGDI Segment Blending		x	x	x	x	x	x	x	x
Early Math Skills	x	x	x	x	x	x			
PIAT-R Reading Comprehension						x		x	x

This report includes results for three of those assessments, the PPVT, the Woodcock-Johnson III: Letter-Word Identification and the Woodcock-Johnson III: Applied Problems subtests.

**PPVT.** The PPVT is a widely used test of receptive language. During administration, a child is shown a page with four pictures and asked to point to the picture of the item that the assessor names. PEELS uses a psychometrically adapted and shortened version of the PPVT-III developed using Item Response Theory (IRT). IRT scaling estimates two aspects of a test. First, it estimates the proficiency scores of each student. Second, it estimates how well a student will do on each item if the student is at a certain level of proficiency. This latter estimate is the item response of IRT. If the item response functions of all items are known, what total score a student will get if he/she is at a given level of proficiency can be predicted. These item responses are assumed to be constant from one sample to another in IRT. Because of this invariance of item responses across samples, if two groups are given the same set of items, then the proficiency scales can be linked. Following a method detailed in Stocking and Lord (1983), the proficiency scales between two samples can be linked by finding a linear transformation of the proficiency scales that preserves the item responses of the items.

In PEELS, all children completed a core set of PPVT items. Based on their performance on the core, they either took an easier, basal set of items; stopped after the core set; or took a harder (ceiling) set of items. This adaptation was based on the full-length PPVT III and earlier work for the Head Start Family and Child Experiences Survey (FACES) ([www.acf.hhs.gov/programs/opre/hs/faces/index.html](http://www.acf.hhs.gov/programs/opre/hs/faces/index.html)) and Head Start Impact Study (HSIS) ([www.acf.hhs.gov/programs/opre/hs/impact\\_study/index.html](http://www.acf.hhs.gov/programs/opre/hs/impact_study/index.html)). It is

the researchers' experiences on these studies (i.e., FACES and HSIS) that formed the expectations for children in PEELS on the PPVT in Wave 1. Expectations and decision rules in Waves 2 and 3 were based on how the children in PEELS performed in previous waves.

The 32-item PEELS PPVT was developed using the same approach as the one used for the 40-item HSIS 2002 test. In selecting items for PEELS, the goal was to select a core set of items so 67 percent of the PEELS children (i.e., those scoring within one standard deviation of the mean) would only need to be administered that core set of items (i.e., the core set alone would provide a good estimation of their skills). Easier items on the PPVT were used in the basal set and harder items in the ceiling set. With these adjustments, PEELS Form A (for Wave 1) was constructed with 32 items, 14 core items, 8 basal items, and 10 ceiling items. Children's scores on the various parts of the test were transformed into a single score and placed on a standardized scale with a mean of 100 and a standard deviation of 15.

The IRT true-score for the items in the Form A core set was used to derive basal and ceiling decision rules appropriate for the PEELS target population. The IRT true-score was a model-based estimate of the number-right raw score, which assessors could calculate in the field by adding up the number of correct responses on the core set. About 67 percent of the population was expected to be found between  $-2.419$  and  $-0.393$ . These values roughly correspond to 6 correct responses at the low end and 12 correct responses at the high end. Consequently, the basal decision rule stated that six or fewer correct responses required administration of the basal items. In planning the assessment, approximately 16 percent of the children were expected to receive 14 core plus 8 basal items, for a total of 22 items. The ceiling decision rule stated that 12 or more correct responses required administration of the ceiling items. Approximately 16 percent of the children were expected to receive 14 core plus 10 ceiling items for a total of 24 items. The remaining 67 percent were expected to receive only the 14 core items, reducing substantially the average time required for completing the subtest. The IRT estimate of test reliability for a population having distribution parameters equal to those of the PEELS latent ability distribution is  $r_{xx} = 0.781$ . The sample-based IRT reliability obtained from ability estimates and standard errors of measurement in PEELS is  $r_{xx} = 0.861$ .

Since the PEELS adapted version of the PPVT and the full PPVT have a common subset of items, it was possible to apply a Stocking Lord transformation to the proficiencies of the PEELS assessment so that proficiencies were comparable to the national norming sample. Therefore, the PPVT short forms yield the same expected score values as the full PPVT, making the publisher's norms appropriate. The expected score values on the shortened form have somewhat larger standard errors, due to the smaller number of items.<sup>16</sup> The standard version of the PPVT-III had high alternate form reliability for the standardized scores (.88 to .96). Split-half reliability coefficients were also high (.86 to .97). Test-retest reliability coefficients on the PPVT standard form were in the .90s (Dunn and Dunn 1997). Standard form PPVT-III scores were significantly correlated with age; the steepest part of the growth curve occurred from 2 ½ to 12 years of age. Dunn and Dunn (1997) reported that the PPVT-III correlated with the Wechsler Intelligence Scale for Children—Third Edition (Wechsler 1991;  $r = .82$  to  $.92$ ), Kaufman Adolescent and Adult Intelligence Test (Kaufman and Kaufman 1993;  $r = .76$  to  $.91$ ), Kaufman Brief Intelligence Test (Kaufman and Kaufman 1990;  $r = .62$  to  $.82$ ), and the Oral and Written Language Scales (Carrow-Woolfolk 1995;  $r = .63$  to  $.83$ ). PPVT standard scores were generated for 2,352 PEELS participants in Wave 1 and 2,669 in Wave 2. The estimated reliability of the PPVT short form was .86, meaning that about 86 percent of what the test measured reflected the true underlying construct.

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<sup>16</sup> The larger standard errors could be problematic in a clinical setting in which decisions are being made about individuals. However, in a research setting, standardized scores are used for population and subgroup estimates, and the norms allow comparisons with the overall national population of identical age.

**The Woodcock-Johnson III: Letter-Word Identification subtest.** The Letter-Word Identification test measures the child's word identification skills. Initial items require the child to identify letters that appear in large type, and the remaining items require the child to pronounce words correctly. The child is not required to know the meaning of any word. Test items progress in difficulty from common to uncommon words in written English. Each item is given a score of 1 for a correct response and 0 for an incorrect response or no response. Administration of the test continues until the child either finishes all of the items or misses the last six consecutive items at the end of a test page. The standard score scale used in the Woodcock-Johnson III: Letter-Word Identification is based on a mean of 100 and a standard deviation of 15.

McGrew and Woodcock (2001) reported a 1-year test-retest correlation of .92 for children 4 to 7 years of age. Test scores were correlated with age (McGrew and Woodcock 2001). They also reported that the complete Woodcock-Johnson III achievement battery was correlated with the Wechsler Individual Achievement Test (Wechsler 1992;  $r = .79$ ) and the Kaufman Test of Educational Achievement (Kaufman and Kaufman 1985;  $r = .79$ ). In Wave 1, Wave 2, and Wave 3 of PEELS, 2,434, 2,711, and 2,723 children, respectively, had standard scores for the Woodcock-Johnson III: Letter-Word Identification subtest.

**The Woodcock-Johnson III: Applied Problems subtest.** The Woodcock-Johnson III: Applied Problems subtest requires the child to analyze and solve math problems. In this test, the assessor presents the child with a picture and asks the child a question, such as "How many dogs are in this picture?" The child must recognize (understand) the request, then perform the correct operation. In this case, the child must count the number of dogs in the picture. The math problems are ordered with increasing difficulty either in the operation the child is required to perform (addition as opposed to subtraction) or in the age-appropriate experience with the particular concept, such as coin identification, telling time, reading temperature, etc. Children were awarded 1 point for each correct answer and 0 for each incorrect answer. The test was terminated when the child either finished all items or missed six consecutive items at the end of a test page. Scores were totaled and converted to a norm-referenced scale with a mean of 100 and a standard deviation of 15. Test developers reported a 1-year test-retest correlation of .92 for children 4 to 7 years of age (McGrew and Woodcock 2001). Standard scores on the Applied Problems subtest were available for 2,437 PEELS children in Wave 1, 2,711 in Wave 2, and 2,723 in Wave 3.

**Spanish assessment.** A Spanish version of the direct assessment was available for children who had limited comprehension of English as demonstrated by 1) answering fewer than five items correctly on the English version of the preLAS Simon Says and Art Show (combined) and 2) answering five or more items correctly on the Spanish preLAS Simón Dice and Muestra de Arte (combined). The Spanish assessment included subtests from preLAS 2000 Simón Dice and Muestra de Arte; Woodcock-Muñoz Letras y Palabras; Problemas Aplicados, and Conceptos Cuantitativos (Woodcock and Muñoz 1996); Leiter-R Attention Sustained Scale; IGDI: Picture Naming; and Test of Early Math Skills. Because of the small number of children completing the direct assessment in Spanish, 31 total across Waves 1-3, Spanish direct assessment results are not presented in this report. Children who completed a direct assessment in Spanish were excluded from analyses of scores from the English direct assessment.

**Alternate assessment.** For children who could not complete the direct assessment in English, the Adaptive Behavior Assessment System II (ABAS-II) was used as an alternate assessment. The ABAS-II is a checklist of the child's functional knowledge and skills and is completed by a teacher or other service provider. It assesses children's functional performance in several areas: communication, community use, functional (pre) academics, school living, health and safety, leisure, self-care, self-direction, social, and work. It also can be used to produce composite scores in conceptual, social, and practical domains. The scaled scores for each of the skill areas are based on a mean of 10 and a standard deviation of 3.

The ABAS-II has two versions. The first version, the Teacher/Daycare Provider Form, is for children not yet in kindergarten and measures the adaptive skills that have primary relevance for toddlers' and preschoolers' functioning in a daycare center, home daycare, or preschool. The second version, the Teacher Form, is for children in kindergarten or higher grades and measures the adaptive skills that have primary relevance for children's functioning in a school setting. In Wave 1, there were 338 PEELS children requiring an alternate assessment who had standard scores on the entire Teacher/Daycare Provider Form and 17 who had standard scores on the entire Teacher Form. In Wave 2, there were 152 who had scores on the Teacher/Daycare Provider Form and 72 who had standard scores on the entire Teacher Form. In Wave 3, there were 165 who had standard scores on the entire Teacher Form. The Teacher/Daycare Provider Form was not administered in Wave 3 because it is for children not yet in kindergarten, and virtually all of the children were in kindergarten or higher grades. These counts include children who took a direct assessment in Spanish and also had an alternate assessment completed for them.

Harrison and Oakland (2003) reported coefficient alpha reliabilities for the ABAS-II subtests on the Teacher/Daycare Provider Form ranging from .72 to .94, depending on the age group and subtest, with higher reliabilities for composite domain scores ( $r = .92$  to  $.97$ ). On the Teacher Form, they reported coefficient alphas ranging from .84 to .97, with composite domain coefficients in the .96 to .98 range. Test-retest reliabilities for periods of 2 days to 6 weeks ranged from .66 to .98, depending on age level and subtest. The correlation between the overall composite scores on the ABAS-II, Teacher/Daycare Provider Form, and Vineland Adaptive Behavior Scales, Classroom Edition was  $r = .75$ . The correlation between the ABAS-II Teacher Form overall composite and Vineland overall composites was  $r = .84$  (Harrison and Oakland 2003).

**Assessment procedures.** When a case was assigned to an assessor, the assessor received a scoring booklet that was specific to the child. A label on the cover indicated the child's first name, last initial, and date of birth. The scoring booklet included instructions for administering the assessments as well as a place for recording children's responses to each item for each subtest. The scoring booklet also included a place to record information from a screening interview the assessor conducted with the child's teacher, service provider, or parent. The screening interview was designed to prepare the assessor for the test session. It helped identify any needed test accommodations, whether the child could participate in the standard assessment or required an alternate assessment, and whether the child should be referred to a bilingual assessor. Before returning the completed scoring booklet, assessors completed a child assessment summary, which captured contact information for the child's current teacher or service provider, whether the direct or alternate assessment was used, the date the assessment was completed, the location where it was completed, accommodations used, and the assessor's certification that he/she assessed the child and the scores were an accurate representation of the child's performance. The assessors were paid \$100 for each assessment they completed.

If an alternate assessment was required, the assessor gave the ABAS-II to the appropriate respondent (i.e., child's teacher or other service provider) and documented the reason for the alternate assessment in the child assessment summary. The assessor received \$50, and the respondent completing the alternate assessment received \$50.

Assessors were instructed to offer a variety of test accommodations so participating children could demonstrate what they know and what they can do. In order to assist with decisions regarding accommodations, the PEELS Assessors' Manual included 21 pages from the following document: *Making Assessment Accommodations: A Toolkit for Educators* (Council for Exceptional Children 2000). These pages contain references to accommodations in the *IDEA*, guiding principles for making assessment accommodations, a description of types of accommodations (e.g., scheduling, setting, presentation, and response), and questions and answers about making accommodations. As noted

previously, assessors determined what test accommodations were needed for individual children based on information gathered during the Screening Interview.

The following accommodations were made available without prior approval from PEELS home-office staff:

- enlarged print,
- assessments given by someone familiar with the child,
- assessments given in the presence of someone familiar with the child,
- someone to help the child respond,
- specialized scheduling,
- adaptive furniture,
- special lighting,
- abacus,
- communication device, and
- multiple testing sessions.

The above accommodations are among those permitted on the Woodcock-Johnson III: Achievement Battery (McGrew and Woodcock 2001). Prior approval from PEELS home office staff was required for using sign language interpreters because of procedures established for their remuneration.

The number of children who received various accommodations in Wave 1, 2, and 3 is presented in table 11.

In Wave 1, there were 350 children who had one or more accommodations, which is 14 percent of the children who completed the English or Spanish direct assessment and for whom accommodation data were available. Because children could receive more than one accommodation, the total number of accommodations received in Wave 1 was 399. In Wave 2, 8 percent of children had one or more accommodations ( $n = 214$ ), and in Wave 3, there were 6 percent ( $n = 149$ ). Appendix F provides information on the number of children who had various test accommodations by gender, race/ethnicity, cohort, and primary disability. With regard to having one or more test accommodations, there were no statistically significant differences in Wave 1, Wave 2, or Wave 3 by gender, race/ethnicity, or age cohort. There were differences across disability categories, ranging in Wave 3 from 3 percent of children identified as having a learning disability or a speech or language impairment to 22 percent of children identified as having a low-incidence disability (i.e., visual impairment, hearing impairment, deaf-blindness, multiple disabilities, or traumatic brain injury) ( $\chi^2 = 147.392$ ,  $p < .0001$ ).

Children who completed English direct assessments with accommodations (14% of the children with completed assessments in Wave 1, 8% of those in Wave 2, and 6% in Wave 3) were included in direct assessment analyses. Their scores were analyzed in the same way as scores for children who did not require accommodations.

**Table 11. Number of PEELS children who received various test accommodations, by school year: School years 2003-04, 2004-05, and 2005-06**

Accommodation	Wave 1 2003-04	Wave 2 2004-05	Wave 3 2005-06
Abacus	‡	‡	‡
Adapted furniture	19	12	16
Communication device	9	4	7
Enlarged print test easel	‡	‡	4
Familiar person administered assessment	3	‡	3
Familiar person present during testing	174	82	45
Multiple test sessions	101	85	38
Person to help child respond	14	8	6
Sign language interpreter	‡	3	3
Other accommodation (e.g., parent present and quiet location)	14	18	22

‡ Reporting standards not met.

NOTE: These counts include children receiving accommodations on the Spanish assessment but not children in the alternate assessment group.

<sup>3</sup>As an accommodation, assessments were occasionally given by a service provider familiar with the child or a service provider helped the child respond to assessment items (e.g., clarified responses the assessor could not understand because of the child's articulation difficulties). In each case, the trained PEELS assessor was present, managed use of the accommodation, and scored the test.

### ***Mail Questionnaires***

The Elementary School Principal Questionnaire or Early Childhood Program Director Questionnaire was sent to principals or program directors, as appropriate, of the children's schools/programs. These questionnaires ask about school/program and community characteristics; student characteristics; staff, programs, and resources; special education programs and practices; and parent involvement. Only one Elementary School Principal Questionnaire or Early Childhood Program Director Questionnaire was sent to each school/program, regardless of the number of PEELS-participating children. The Wave 1, Wave 2, and Wave 3 response rates were 73 percent, 77 percent, and 56 percent, respectively. However, data on school/program characteristics from the Quality Education Data (QED) file were used to supplement data from the questionnaires, bringing the percentage of organizations with some data to 94, 95, and 94 percent for Waves 1, 2, and 3, respectively.

Two versions of the teacher questionnaire were used in Wave 1, the Early Childhood Teacher Questionnaire (for children not yet in kindergarten) and the Kindergarten Teacher Questionnaire. An Elementary Teacher Questionnaire for children in grades 1 and higher was added in Wave 2. All three teacher questionnaires ask about the specific child named on the inside cover and the child's experiences in the class or program. Questionnaire items address classroom staffing and materials, interaction with peers without disabilities, teachers' philosophies of early childhood education, and children's transitions in and out of their current programs. A pull-out section of the teacher questionnaires addresses the children's special education programs and related services. The questionnaires were completed by either the classroom teacher or the special education service provider, as appropriate. In Wave 1, 2,018 Early Childhood Teacher Questionnaires and 269 Kindergarten Teacher Questionnaires were completed, for response rates of 79 percent and 73 percent, respectively. In Wave 2, 1,320 Early Childhood Teacher Questionnaires, 957 Kindergarten Teacher Questionnaires, and 314 Elementary Teacher Questionnaires were completed, for response rates of 86 percent, 79 percent, and 86 percent, respectively. In Wave 3, 346

Early Childhood Teacher Questionnaires, 992 Kindergarten Teacher Questionnaires, and 1,176 Elementary Teacher Questionnaires were completed, for response rates of 82 percent, 81 percent, and 81 percent, respectively.

The teacher questionnaires also include the following teacher rating scales (indirect assessments): three subtests of the ABAS-II—Functional (Pre) Academics, Self-Care, and Self-Direction; the Vineland Adaptive Behavior Scales Classroom Edition, Motor Skills Domain; the Preschool and Kindergarten Behavior Scales, Second Edition; and the Social Skills Rating System. Results from two of these rating scales are included in this report: the PKBS-2 and SSRS.

**PKBS-2.** The PKBS-2, which was included in the Early Childhood Teacher, Kindergarten Teacher, and Elementary School Teacher Questionnaires in Waves 1 and 2, is specifically designed to evaluate the social skills and problem behaviors of children 3 to 6 years of age. It is a norm-referenced, standardized instrument that includes two scales, a Social Skills Scale (34 items) and a Problem Behavior Scale (42 items). It comprises five subscales—Social Cooperation, Social Interaction, Social Independence, Externalizing Problems, and Internalizing Problems. Teachers are asked to rate how frequently the identified child exhibited a series of skills or behaviors such as those noted above during the previous 3 months. The measurement scale consists of four points, labeled *never*, *rarely*, *sometimes*, and *often*. The standard scores for the Social Cooperation, Social Interaction, and Social Independence subscales are summed to create the Social Skills composite score, and Externalizing and Internalizing Problems are summed to create the Problem Behavior scale. The composite scores are then converted to composite standard scores. PKBS-2 standard scores are based on a distribution with a mean of 100 and a standard deviation of 15 (Merrell 2002). PEELS used the school-rater form of this measure.

Test developers reported Cronbach alpha coefficients of .96 to .97 for children 3 to 6 years of age on the Social Skills Scale and .93 to .95 on the Problem Behavior Scale. Three week test-retest reliability for subscales of the Social Skills Scale ranged from .58 to .66. For subscales of the Problem Behavior Scale, test-retest reliability was in the .70 to .78 range.

Merrell (1995) reported correlations between the PKBS-2 Social Skills Scale and the Social Skills Rating System (SSRS, Gresham and Elliott 1990) that ranged from .32 to .76 and correlations between the PKBS-2 Problem Behavior Scale and the SSRS that ranged from .25 to .83. Correlations between the Matson Evaluation of Social Skills with Youngsters (MESSY, Matson, Esvelt-Dawson, and Kazdin 1983) and the PKBS-2 Social Skills Scale were .62 to .85, while correlations between the PKBS-2 Problem Behavior Scale and MESSY were .22 to .72. The Conduct Problem section of the Conners Teacher Rating Scales (CTRS-39, Conners 1990) and the PKBS-2 Externalizing Problems Subscale were correlated (.87), as were the CTRS-39 Emotional-Overindulgent Scale and the PKBS-2 Internalizing Problems Subscale (.78). The PKBS-2 Social Skills and School Social Behavior Scales (Merrell 1993) were also correlated (.86). In Wave 1, a total of 2,192 children had PKBS scale scores; in Wave 2, a total of 2,540 had scores.

**Social Skills Rating System.** In Wave 3, the PKBS was replaced with the SSRS because it has norms for older children. The SSRS provides a measure of each child's social and behavioral skills. Teachers are asked to rate how frequently the identified child exhibited a series of skills or behaviors during the previous month or two. The measurement scale consists of three points. The scale points are labeled as follows: 0, *never*; 1, *sometimes*; and 3, *very often*.

The SSRS is divided into two scales, the Social Skills Scale and the Problem Behaviors Scale. The Social Skills Scale measures the following positive social behaviors: cooperation, empathy, assertion, self-control, and responsibility. A higher rating on the Social Skills Scale indicates a higher level of social adjustment. The Problem Behaviors Scale measures behaviors that can interfere with the development of positive social skills. It assesses behavior in three subscales: externalizing problems, such as aggressive

acts and poor temper control; internalizing problems, such as sadness and anxiety; and hyperactivity, such as fidgeting and impulsive acts.

The SSRS Teacher form was standardized on a national sample of over 200 teachers who rated over 1,300 children. The teacher sample was 88 percent female and 90 percent white. Eleven percent of teachers in the sample were special education teachers. It provides separate norms for males and females. The raw scores for both scales are converted to standard scores. SSRS standard scores are based on a distribution with a mean of 100 and a standard deviation of 15 (Gresham and Elliott 1990). In Wave 3, a total of 1,751 males and 730 females had SSRS scores.

## **Data Preparation and Analysis**

This section describes methods used to impute for item and unit nonresponse, develop sampling weights, estimate variance, create major independent variables, develop scales, test for statistical significance, and suppress scarcely populated cells.

### ***Imputation***

In data preparation, imputation was conducted for selected items on the child assessment, teacher questionnaire, and parent interview data. In general, the item missing rate was fairly low. For the Wave 1 parent interview, the item missing rates for the augmented sample were less than 10 percent for 702 variables and 10 to 14 percent for 34 variables; three variables had rates between 15 and 17 percent. For Wave 2, there were no missing values for 235 variables and a missing rate of less than 9 percent for 265 variables; only two variables had higher rates, 15 percent for one and 24 percent for another. Of the 498 variables used in Wave 3, there were no missing values for 314 parent interview items and missing rates of 1 to 4 percent for the other 184 variables.

For teacher questionnaire data in Wave 1, item missing rates were under 10 percent for 94 percent of variables, 10 to 15 percent for 4 percent of variables, and 15 to 22 percent for 2 percent of variables. In Wave 2, the item missing rates were under 5 percent for 99 percent of teacher questionnaire variables and 5 to 10 percent for 1 percent of the variables. For Wave 3, the item missing rates were under 5 percent for 99 percent of the variables and 6 to 10 percent for 1 percent of the variables.

For the Wave 1 assessment data, 80 percent of the variables had missing rates of 16 percent or less. Twenty percent of the variables had missing rates between 24 and 26 percent. In Wave 2, 95 percent of the variables had missing rates of less than 2 percent, and 5 percent of the variables had missing rates of 2 to 3 percent. In Wave 3, 90 percent of the assessment variables had missing rates of less than 2 percent. The other 10 percent had missing rates below 3 percent. The item missing rate prior to imputation was higher in Wave 1 because data for the supplemental sample were missing.

Imputed values may have two undesirable features. The first is that they may cause bias in an estimate calculated from the post-imputed data. The second is that the variance of such estimates may increase. If the imputed values are treated as real values and an ordinary variance estimator is used, this increased variance is not reflected and the variance is underestimated, which can lead to an erroneous inference. These potential problems become more serious if the percentage of imputed cases in the analysis sample is high (for example, over 20%). However, the percentage of imputation for the supplemental sample was between 6.6 and 8.7 percent of the augmented sample, depending on the instrument. Therefore, the risk of imputation-related bias was judged to be minimal. The variance inflation due to imputation was also contained because the imputation rate was below 10 percent. Imputation for the supplemental sample increased the amount of data usable for analysis, offsetting the potential risk of bias.

Researchers used different methods of imputation depending on the nature of missing and available information for imputation. The methods included hot-deck imputation, regression, external data source, and deterministic or derivation method, based on the internal consistency principle of inter-related variables. In some cases, a postulated value was imputed after analyzing missing patterns. Whenever a value of a variable was imputed, an imputation flag for the variable was created in the data set to record the change.

### ***Weighting***

The data presented in the report have been weighted to generate national estimates. Different weights have been used depending on the sources of data. These weights adjust the child base weights given to the 3,104 recruited families to account for nonresponse on specific data collections in specific waves or groups of waves. Appendix B includes complete information on the weights.

### ***Variance Estimation***

It is extremely difficult to obtain an unbiased variance estimator for a complex sample like the one used in PEELS. The jackknife variance estimator was used; it takes account of clustering effects and other weighting adjustments for nonresponse and post-stratification. The variance estimator is usually slightly conservative and tends to lead to a slightly smaller chance of type I error than indicated by the significance level of the test. PEELS researchers performed post-stratification whenever possible to enhance the precision of the survey estimates. All standard errors and significance tests were conducted using WesVar Version 4.2 (Westat 2002) to account for the complex probability sampling and weighting used in PEELS.

### ***Independent Variables***

Two independent variables used throughout the report require some description. Parents provided information on the children's race/ethnicity. Because of the small number of American Indian or Alaska Native and Asian children in the study, data for those subgroups were considered unreliable and were not included in the analyses of race/ethnicity. Children of all races/ethnicities were included in the remainder of the analyses. A three-group race/ethnicity variable was used with the following definitions:

- Hispanic—children who were Hispanic and of any race;
- Black—children who were Black or African American only and not Hispanic; and
- White—children who were White only and not Hispanic.

The disability categories used in data collection are those specified in *IDEA*. Children's primary disability category in Wave 1 was obtained from their teachers or service providers; however, if service provider data were missing, disability information was obtained from the children's parents or enrollment form. Because of the small sample sizes for some disability categories, a "low-incidence" category was created that included deaf/blindness, deafness, hearing impairment, traumatic brain injury, visual impairment, and other disabilities identified by parents (e.g., comprehension problems; hand-eye coordination).

### ***Scale Development***

To facilitate data analysis and reduce the number of independent variables, researchers created a number of scales, including a behavior scale, a social relations at school scale, and a severity of disability

scale. To develop the first two of these scales, Master's Partial Credit Model, an extension of the Rasch model (Wright and Masters 1982) was used.

Unidimensionality along the construct was determined by goodness-of-fit statistics—in the case of Rasch models, infit statistics. Infit statistics compare each child's observed response pattern to his/her expected response pattern for each specific overall score. The expected value of the mean-square version of this statistic, the infit mean-square, is 1.00. Deviation above 1.00 indicates potential departures from unidimensionality; values less than 1.00 flag potential violations of local independence. This value, when standardized, approximates a z-distribution with a mean of zero and a standard deviation of one; the criterion values for goodness-of-fit for these analyses were 0.6 to 1.4.

The *behavior scale* includes 29 items from the parent interview related to parents' perceptions of their child's behavior. This scale includes items that measure parents' perceptions of the extent to which their child is quiet and passive, is jumpy and easily startled, pays attention and stays focused, likes to do things on his/her own, is very active and restless, tries to finish things even if it takes a long time, gets easily involved in everyday things, is distracted by sights and sounds, has difficulty adjusting to changes, is often anxious or depressed, and shows interest in adults. The scale also includes items on how much parents' think their child has trouble playing with other children, has trouble making friends, takes turns and cooperates, has temper tantrums, is easy to manage, and has trouble getting to sleep. Additionally, the scale includes an item on how physically aggressive a parent's child is with other children, an item on whether a child has been invited to another child's birthday party in the past year, and an item on the appropriateness of a child's behavior. The scale also includes items on parents' perceptions of whether their family has difficulty doing certain activities because of the child's behavior or disability, including going to a grocery store, shopping mall, restaurant, public park, church or other place of worship, library, movie, or vacations. A general item on how easy it is to take the child places compared to other children his/her age is also included in the behavior scale.

The *social relations at school scale* comprises six items that ask parents about the amount of time their child spends with typically developing children, how well their child gets along with other children at his/her program, and how well their child gets along with teachers. This scale also includes items on whether the child has been bullied or picked on by other children, has been physically attacked or involved in fights, or has been teased or called names.

The *severity of disability scale* is a six-component variable from the parent interview based on the framework of the ABILITIES Index (Bailey, Simeonsson, Buysse, and Smith 1993) consisting of cognition, communication, overall health and limitations due to health, regulation of activity level, regulation of attention, and understanding of language (for details, see Daley, Simeonsson, and Carlson 2008). Using the PEELS sample, validity of an abbreviated index was also established through significant correlations with age at which children began receiving special education or therapy service ( $r = -.22, p < .001$ ), the teacher-reported amount of modification to curriculum materials ( $r = .42, p < .001$ ), and with the number of services the child received in the school ( $r = .37, p < .001$ ). The PEELS ABILITIES Index also significantly differentiated between children who took alternate and direct assessments in PEELS (Daley, Simeonsson, & Carlson 2008). Children who took the alternate assessment had a mean of 16.3 ( $S.E. = 0.25$ ) as compared to a mean of 12.4 ( $S.E. = 0.11$ ) for children who completed the PPVT, Letter-Word Identification and Applied Problems subtests ( $t = 714.76, p < 0.001$ ).

### **Significance Testing and Cell Suppression**

Chi-squares,  $t$  tests for dependent samples, and ANOVAs were performed to examine statistically significant differences across subgroups and over time within subgroups. The  $t$  tests for dependent samples took into account the correlations between the Wave 1 through 3 samples. All individual tests

were performed using a 5 percent significance level. If the chi-square was significant, a t-test for dependent samples was conducted to examine differences between groups. Similarly, if an ANOVA was significant, a Wald F test was conducted to examine differences between groups.

Sometimes, related  $t$  test results were discussed as a group or family of tests. In those cases, researchers controlled the family-wise error rate to avoid making false positive claims. The Benjamini-Hochberg procedure (Benjamini and Hochberg 1995), known to be less conservative than Bonferroni correction, was used for multiple testing situations. This procedure controls the false discovery rate (FDR) at a set level instead of the family-wise error rate.<sup>17</sup> If the  $p$ -value adjusted using the Benjamini-Hochberg procedure is greater than the original  $p$ -value, the result is significant at the 0.05 level.

In all data displays, if the number of cases in a cell dropped below 3, data were suppressed, and a footnote was added to indicate that “Reporting standards were not met.” This convention was used to maintain data confidentiality.

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<sup>17</sup> False discovery rate is the expected error rate of making false positives among all positive claims. If this is set to be small, say 0.05, the Benjamini-Hochberg procedure controls FDR at 0.05.

## Chapter 3: Transitions Among Young Children With Disabilities

One of the broad goals of PEELS is to describe the transitions that young children with disabilities undergo between early intervention and preschool and between preschool and elementary school. A previous PEELS report (Markowitz et al. 2006) described transitions for children as they moved from early intervention to preschool. In this chapter, information is presented on different types of transitions that children experience, changes in their services, and changes in their eligibility status as they go from one preschool program to another or change grades. The remainder of the chapter is focused on the transition to kindergarten. Data on how the perceived ease of this transition varies by different demographic characteristics, child characteristics, and school involvement and support and how often different strategies are used by teachers to facilitate kindergarten entry are presented.

In this chapter, all comparative statements made have been tested for statistical significance using chi-square tests, unless otherwise noted. If the chi-square was significant, a *t*-test for dependent samples was conducted to examine differences between groups. Differences are discussed in this chapter only if they were found to be statistically significant at the .05 level.

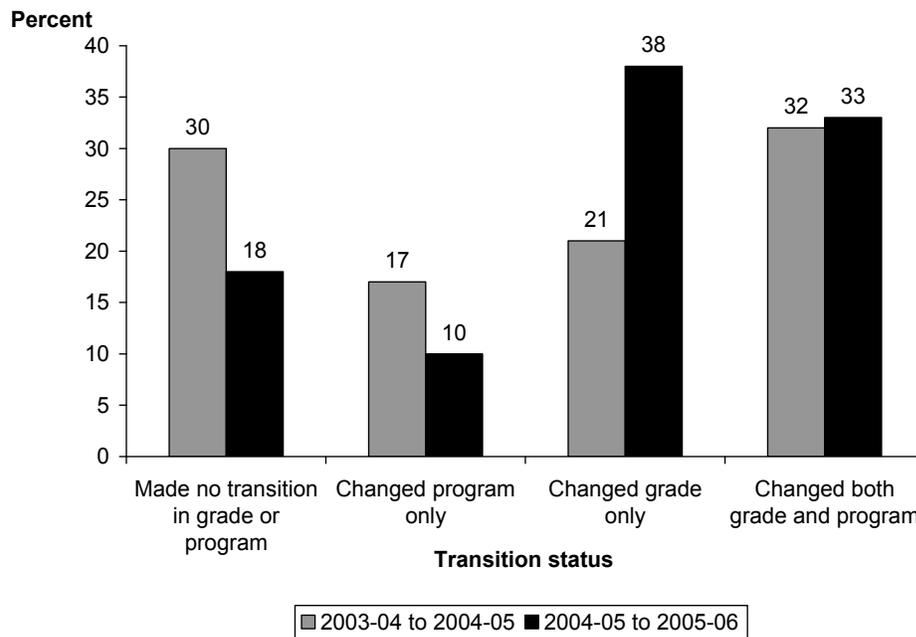
### Change in Program and Grade at Times of Transition

To characterize the type of change that occurred as part of a child's transition between preschool programs and grades, children in PEELS were divided into four transition status groups based on the type of transitions: those with no transition in grade or preschool program, those changing only from one preschool program to another, those changing their grade only, and those changing both their grade and program. As illustrated in figure 1, approximately one-third of the children underwent both a change in grade and a change in program between 2003-04 and 2004-05 (32%, *S.E.* = 1.6) and between 2004-05 and 2005-06 (33%, *S.E.* = 2.1). There were no statistically detectable differences in the transition status of children (those with no transition in grade or program, those changing their program only, those changing their grade only, and those changing both their grade and program) by gender (2003-04: *p* = .448, 2004-05: *p* = .735), race/ethnicity (2003-04: *p* = .676, 2004-05: *p* = .290) disability category (2003-04: *p* = .086, 2004-05: *p* = .136), or family income (2003-04: *p* = .711, 2004-05: *p* = .533).

### Change in Services at Times of Transition

Services for young children with disabilities are intended to change as the child's educational needs change, and, typically, the appropriateness of each service and the need for additional services are evaluated during each IEP meeting. In general, studies that have evaluated the degree of stability in programming over time have found that children do experience changes in services as they move through school. For example, Clarizio and Halgren (1993) noted that for children at either the preschool, elementary, or secondary school level, change over a 3-year period in service delivery model (whether a consultant, resource room, or categorical classroom placement) occurred for 33 percent of students, and changes in the frequency of services occurred for 71 percent of students.

**Figure 1. Percentage of young children who received preschool special education services during the 2003-04 school year: Transition status by year**



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Elementary School Teacher Questionnaire,” “Kindergarten Teacher Questionnaire,” “Early Childhood Teacher Questionnaire,” and “Parent interview,” previously unpublished tabulation (February 2007).

Young children with disabilities receive a range of services. Table 12 presents the percentage of children participating in PEELS receiving speech therapy, special instruction, occupational therapy, tutoring, and physical therapy in 2003-04 along with changes in services by transition status. The issue of service stability is somewhat unique for young children in transition. To facilitate smooth kindergarten transitions, the National Education Goals Panel (1998) emphasized the importance of *ready schools*, which in part “strive for continuity between early care and education programs and elementary schools (p. 5)”. Loss of gains made while in early intervention, problems in school, and difficulty with peer relationships have been suggested to result from difficult transitions, in part, due to lack of continuity between programs (Kagan and Neuman, 1998).

The stability of services in PEELS was explored in conjunction with transitions from preschool to kindergarten and from kindergarten to first grade. As noted in an earlier PEELS report (Carlson et al. 2008), disability labels change during this early childhood period; between Wave 1 and Wave 2, 23 percent of children were reclassified, and 14 percent of children were declassified. Therefore, changes in services were examined across all disability categories.

**Table 12. Percentage of young children who received preschool special education services during the 2003-04 school year who received additional services and stopped services in 2004-05, by transition between 2003-04 and 2004-05**

	Transition status			
	Total	Made no grade transition	Transitioned from preschool to kindergarten	Transitioned from kindergarten to first grade
Received service in 2003-04				
Speech therapy	91.9	93.4	90.3	92.2
Occupational therapy	35.5	42.3	31.8	26.6
Physical therapy	22.7	27.3	19.5	18.4
Special instruction	44.5	51.7	38.5	41.0
Tutoring	18.2	19.9	18.7	11.8
Other	3.9	3.9	3.4	5.1
Received additional service in 2004-05				
Speech therapy	1.6	1.1	2.1	‡
Occupational therapy	11.3	12.1	11.4	8.1
Physical therapy*	4.7	6.5	2.6	4.9
Special instruction	13.1	10.5	14.0	19.1
Tutoring*	12.2	6.6	12.4	30.8
Other	4.9	3.5	7.9	‡
Stopped service in 2004-05				
Speech therapy	3.4	3.0	3.8	4.2
Occupational therapy	9.6	9.4	9.4	10.7
Physical therapy	7.5	7.5	6.7	9.6
Special instruction	14.1	14.1	15.2	10.8
Tutoring	11.4	12.2	10.6	11.4
Other	2.7	3.4	2.1	‡

\*The chi-square analysis result was significant at  $p < .05$  level.

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Elementary School Teacher Questionnaire," "Kindergarten Teacher Questionnaire," "Early Childhood Teacher Questionnaire," and "Parent interview," previously unpublished tabulation (February 2007).

To identify stability of services, additional services are defined as services received in one school year that were not received in the previous school year. Comparably, stopped services are defined as those that children received in the previous school year but that they are no longer receiving. Fluctuations from year to year in the frequency or amount of a specific service that a child received are not reported here.

There were no statistically detectable differences across transition groups in the number of children receiving specific services in 2003-04. However, the number of children participating in PEELS who received additional physical therapy and tutoring in 2004-05 varied significantly by transition status. Children who made no grade transition (7%,  $S.E. = 1.1$ ) were significantly more likely to have received additional physical therapy than children who transitioned from preschool to kindergarten (3%,  $S.E. = 0.9$ ) ( $t = -2.67, p = .01$ ). In contrast, children who made no grade transition (7%,  $S.E. = 1.0$ ) were

significantly less likely to have received additional tutoring than children who transitioned from preschool to kindergarten (12%, *S.E.* = 2.1) ( $t = 2.39, p = .02$ ) and children who transitioned from kindergarten to first grade (31%, *S.E.* = 5.9) ( $t = 4.21, p < .001$ ). There were no statistically detectable differences across transition groups in the number of children receiving additional speech therapy, occupational therapy, special instruction, and other services in 2004-05. There were also no statistically detectable differences across transition groups in the number of children who stopped receiving specific services in 2004-05.

Table 13 presents similar data, services by transition type, for 2004-05 and 2005-06. There were no statistically detectable differences across transition groups in the number of children who received speech therapy, physical therapy, tutoring, and other services in 2004-05. There were no statistically detectable differences across transition groups in the number of children who received additional services in 2005-06 or who stopped receiving services in 2005-06.

**Table 13. Percentage of young children who received preschool special education services during the 2004-05 school year who received additional services and stopped services in 2005-06, by transition between 2004-05 and 2005-06**

	Transition status			
	Total	Made no grade transition	Transitioned from preschool to kindergarten	Transitioned from kindergarten to first grade
Received service in 2004-05				
Speech therapy	91.6	90.7	91.9	91.9
Occupational therapy	37.5	37.8	42.9	32.9
Physical therapy	20.6	23.6	22.5	17.3
Special instruction	45.1	50.1	46.5	40.9
Tutoring	21.0	22.5	16.1	24.0
Other	6.0	4.2	4.6	8.1
Received additional service in 2005-06				
Speech therapy	1.4	1.5	2.0	0.9
Occupational therapy	5.8	8.4	5.3	4.6
Physical therapy	4.7	4.8	5.6	4.1
Special instruction	14.0	14.6	15.0	12.9
Tutoring	14.4	10.8	16.0	15.4
Other	4.0	3.9	2.6	5.1
Stopped service in 2005-06				
Speech therapy	4.7	4.1	6.0	4.2
Occupational therapy	6.8	6.1	10.3	4.7
Physical therapy	5.6	5.7	6.1	5.3
Special instruction	9.6	10.5	11.9	7.3
Tutoring	12.2	13.0	8.3	14.5
Other	3.4	0.7	3.8	4.7

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Elementary School Teacher Questionnaire," "Kindergarten Teacher Questionnaire," "Early Childhood Teacher Questionnaire," and "Parent interview," previously unpublished tabulation (February 2007).

## Changes in Eligibility Status at Times of Transition

Transitions are a time when eligibility is typically reevaluated (Walker et al. 1988). In particular, the transition to kindergarten may be regarded by some educators and administrators as an opportunity to “give the child a chance” in regular education (Stile, Hudson, Ames, Kelly, LeCrone, and Edgar 1991) and to avoid unnecessary “tracking” (Edgar, Heggelund, and Fischer 1988).

Changes in eligibility status during transition periods were explored for children participating in PEELS. Statistically significant differences across transition categories were observed in the number of children declassified during transition periods ( $p < .001$ ) (see table 14). Children who did not undergo a grade transition were less likely to be declassified between 2003-04 and 2004-05, (5%;  $S.E. = 1.0$ ), than children who transitioned from preschool to kindergarten (20%;  $S.E. = 2.3$ ) ( $t = 6.96, p < .001$ ) and children who transitioned from kindergarten to first grade (24%;  $S.E. = 5.8$ ) ( $t = 3.14, p = .003$ ). Between 2004-05 and 2005-06, the pattern was similar and also statistically significant across transition categories ( $p = .005$ ) (see table 14). Children who did not undergo a grade transition were less likely to be declassified between 2004-05 and 2005-06, (9%;  $S.E. = 1.8$ ), than children who transitioned from preschool to kindergarten (21%;  $S.E. = 2.2$ ) ( $t = 4.8, p < .001$ ).

**Table 14. Percentage of young children who received preschool special education services with different types of transitions and were declassified in the subsequent year**

	Type of transition			
	Total	Made no grade transition	Transitioned from preschool to kindergarten	Transitioned from kindergarten to first grade
Percentage of children in each transition group who were declassified between 2003-04 and 2004-05*	14.0	4.9	20.4	23.3
Percentage of children in each transition group who were declassified between 2004-05 and 2005-06*	15.3	9.2	21.0	14.0

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire,” previously unpublished tabulation (February 2007).

## Transitions Into Kindergarten

After the transition to kindergarten, children typically experience changes from the pre-kindergarten environment, such as greater child-to-teacher ratio, more group instruction, and higher teacher expectations of autonomy and academic skills (LaParo, Pianta, and Cox 2000; Troup and Malone 2002). The change may be more complex for young children with disabilities. A child with a disability may have new staff providing support services, a change in the location of pull-out services or in the mode of services provided in the class, and other adjustments to services received as part of his/her IEP.

To examine this transition period, data from children’s transitions to kindergarten were combined across the 3 years of the PEELS study. Data from 353 children who were in kindergarten during the 2003-04 school year were combined with data from 1,117 children who were in kindergarten during the 2004-

05 school year and 1,126 children who were in kindergarten during the 2005-06 school year.<sup>18</sup> In order to look at the experiences of children before their transition into kindergarten, data from the year prior to the child's transition to kindergarten were designated as "pre-transition."<sup>19</sup> For example, for a child who entered kindergarten in 2004-05, the data from the 2003-04 school year were considered "pre-transition" data.

### ***Location of Previous Setting***

Although some children transition from preschool to kindergarten and experience changes in both their grade and program, others may be in the same school and classroom as they were the previous year or in the same school as the previous year but in a different classroom. During their kindergarten year, teachers of children were asked to report where the child was enrolled or receiving services during the prior year. As shown in figure 2, overall, slightly less than half the children (47%, *S.E.* = 2.1) came from a different program or from home; 7 percent of children (*S.E.* = 0.8) were in the exact same school and class during the previous year (for example, the child repeated kindergarten and had the same teacher in both years); an additional 5 percent (*S.E.* = 1.0) of children were in a different kindergarten classroom at the same school (for example, the child repeated kindergarten in the same school but had different teachers); and an additional 27 percent (*S.E.* = 2.0) remained in the same school but moved from a preschool class to a kindergarten class in the same school.<sup>20</sup>

### ***Ease of Transition***

Parents and teachers were both asked to rate their perception of the child's ease of transition into kindergarten. Parents were given the response options *very easy*, *somewhat easy*, *somewhat hard*, or *very hard*. Teachers were asked if the transition had been *very easy*, *somewhat easy*, *somewhat difficult*, or *very difficult*. Overall, parent and teacher report of the ease of transition was significant and positively correlated ( $r = 0.32, p < .001$ ).

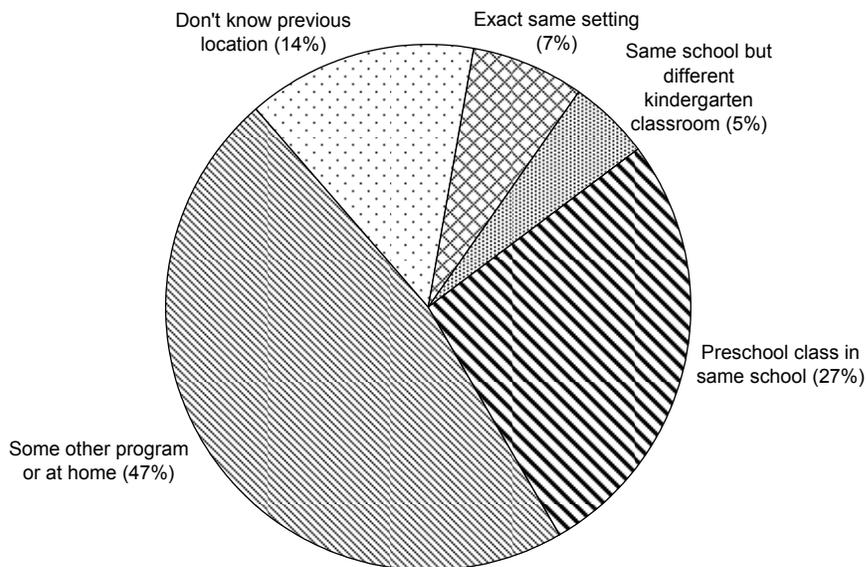
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<sup>18</sup> Analyses presented in this section on transitions to kindergarten include only those children who were in kindergarten in 1 of the 3 years of data collection.

<sup>19</sup> Pre-transition data for children who were in kindergarten during the 2003-04 school year were not available. The sections "Child characteristics: Severity," "Child characteristics: Academic skills," and "Child characteristics: Social skills" include analyses that used pre-transition data.

<sup>20</sup> Unlike other sections in this chapter, the analyses described in this section include children who were in kindergarten for more than 1 year.

**Figure 2. Percentage of young children who received preschool special education services who were in various placements the year before kindergarten, as reported by their kindergarten teacher**



NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

**Demographics.** There were no statistically detectable differences in parent perception of the ease of transition based on the child's disability category ( $p = .089$ ) or child's gender ( $p = .253$ ) (see table 15). There were also no statistically significant differences in teacher perception of the ease of transition based on the child's gender ( $p = .035$ ), race/ethnicity ( $p = .726$ ), disability category ( $p = .02$ ), or family income ( $p = .575$ ) (see table 16). However, there were significant differences in parents' report of ease of transition, by race/ethnicity ( $p < .001$ ) and family income ( $p = .005$ ). For example, parents of Hispanic children were significantly more likely (26%,  $S.E. = 2.7$ ) to report that they had a *somewhat hard* or *very hard* transition than parents of Black children (16%,  $S.E. = 3.0$ ) ( $t = -2.52, p = .01$ ) and parents of White children (13%,  $S.E. = 1.1$ ) ( $t = -4.61, p < .001$ ). Eleven percent ( $S.E. = 1.8$ ) of parents of children in households with incomes of more than \$40,000 reported that they had a *somewhat hard* or *very hard* transition, compared to 16 percent ( $S.E. = 2.5$ ) of parents of children from households with incomes of \$20,001 to \$40,000 ( $t = 3.01, p = .004$ ) and 21 percent ( $S.E. = 2.5$ ) of parents of children in households with incomes of \$20,000 or less ( $t = 2.03, p = .05$ ).

**Table 15. Percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by demographic characteristics**

	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>	84.2	15.8
Child gender		
Male	83.3	16.8
Female	86.6	13.4
Race/ethnicity*		
Black	84.2	15.8
Hispanic	74.4	25.7
White	87.2	12.8
Disability category		
Autism	76.0	24.0
Developmental delay	82.2	17.8
Emotional disturbance	48.8	51.2
Learning disability	81.1	18.9
Mental retardation	84.3	15.7
Orthopedic impairment	‡	‡
Other health impairment	86.7	13.3
Speech or language impairment	88.7	11.3
Low incidence	84.8	15.2
Family income*		
\$20,000 or less	78.7	21.4
\$20,001 to \$40,000	83.4	16.2
More than \$40,000	89.1	10.9

‡ Reporting standards not met.

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Table 16. Percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by demographic characteristics**

	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>	85.1	14.9
Child gender		
Male	83.6	16.4
Female	88.5	11.5
Race/ethnicity		
Black	81.7	18.3
Hispanic	85.4	14.6
White	85.2	14.8
Disability category		
Autism	65.0	35.0
Developmental delay	83.9	16.1
Emotional disturbance	55.0	45.0
Learning disability	‡	‡
Mental retardation	87.6	12.4
Orthopedic impairment	‡	‡
Other health impairment	83.8	16.2
Speech or language impairment	89.5	10.5
Low incidence	76.0	24.0
Family income		
\$20,000 or less	87.0	13.0
\$20,001 to \$40,000	83.4	16.6
More than \$40,000	86.2	13.8

‡ Reporting standards not met.

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Child characteristics: Severity.** Differences in scores on the disability severity index were explored for children whose parents reported that they had an easy or hard transition to kindergarten. Using a measure of severity based on parent report in six domains (cognition, communication, overall health and limitations due to health, regulation of activity level, regulation of attention, and understanding of language; see Daley, Simeonsson, and Carlson 2007), each child received a summative score, with higher scores indicating greater severity of disability. Children whose parents reported easier transitions had significantly lower severity index scores ( $M = 12.4$ ,  $S.E. = 0.21$ ) than those who had hard transitions ( $M = 15.0$ ,  $S.E. = 0.4$ ,  $t = -6.2$ ,  $p < .001$ ), and children whose teachers reported a *somewhat* or *very easy* transition had significantly lower severity index scores ( $M = 12.6$ ,  $S.E. = 0.21$ ) than those who had

difficult transitions ( $M = 14.1$ ,  $S.E. = 0.54$ ,  $t = -2.9$ ,  $p = .006$ ).

**Child characteristics: Academic skills.** School readiness skills have been proposed to play a role in the ease with which a child transitions to kindergarten (McIntyre, Blacker, and Baker 2006; Zill and West 2001). Differences in performance on school readiness measures were explored for children who were reported by parents as having an easy or hard transition to kindergarten. Children whose parents reported a *somewhat* or *very easy* transition had higher scores on the PPVT (a measure of receptive vocabulary) than did children whose parents reported a *somewhat* or *very hard* transition ( $M = 90.3$ ,  $S.E. = 0.82$  and  $M = 86.3$ ,  $S.E. = 1.4$ , respectively,  $t = 2.41$ ,  $p = .019$ ). In addition, children whose parents reported a *somewhat* or *very easy* transition had higher scores on the Woodcock-Johnson Letter-Word Identification subtest (a measure of letter and word identification skills) and higher scores on the Woodcock-Johnson Applied Problems subtest (a measure of children's ability to analyze and solve math problems) than children whose parents reported a *somewhat* or *very hard* transition (Letter-Word:  $M = 98.3$ ,  $S.E. = 0.6$  and  $M = 92.5$ ,  $S.E. = 1.4$ , respectively,  $t = 4.07$ ,  $p < .001$ ; Applied Problems:  $M = 92.3$ ,  $S.E. = 0.87$  and  $M = 85.8$ ,  $S.E. = 1.5$ , respectively,  $t = 3.90$ ,  $p < .001$ ).

Differences in performance on school readiness measures were also explored for children who were reported by teachers as having an easy or difficult transition to kindergarten. Children whose teachers reported an easy or difficult transition did not differ in performance on the PPVT ( $M = 89.6$ ,  $S.E. = 1.0$  and  $M = 89.7$ ,  $S.E. = 1.1$ , respectively,  $t = -.04$ ,  $p = .969$ ), Woodcock-Johnson Letter-Word subtest ( $M = 96.3$ ,  $S.E. = 0.7$  and  $M = 99.8$ ,  $S.E. = 3.1$ , respectively,  $t = -1.12$ ,  $p = .266$ ) or Woodcock-Johnson Applied Problems subtest ( $M = 90.2$ ,  $S.E. = 1.0$  and  $M = 88.8$ ,  $S.E. = 1.7$ , respectively,  $t = .69$ ,  $p = .491$ ).

Both parent and teacher ratings of ease of transition significantly varied by teacher ratings of academic skills ( $p < .001$  for both parents and teachers) (see tables 17 and 18 ). For example, significantly more children whose parents reported a *somewhat* or *very hard* transition were rated by their teachers as academically *below or far below average* (23%,  $S.E. = 2.2$ ) than *average* (11%,  $S.E. = 1.7$ ) ( $t = -4.52$ ,  $p < .001$ ), or *above or far above average* (7%,  $S.E. = 2.2$ ) ( $t = -5.32$ ,  $p < .001$ ). Likewise, significantly more children whose teachers perceived a *somewhat difficult* or *very difficult* transition, were rated by their teachers as academically *below or far below average* (20%,  $S.E. = 2.2$ ) than *average* (11%,  $S.E. = 2.1$ ) ( $t = -2.79$ ,  $p = .007$ ), or *above or far above average* (8%,  $S.E. = 1.8$ ) ( $t = -4.36$ ,  $p < .001$ ).

**Child characteristics: Social skills.** Among typically developing children, the association between appropriate social skills and facilitation of kindergarten transitions is well documented. For example, McIntyre and colleagues (2006) found a significant association between teacher-reported social skills and a composite measure of adaptation to school among children entering kindergarten, even controlling for IQ.

**Table 17. Percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by child characteristics**

	Ease of transition: parent report	
	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>	84.2	15.8
Teacher ratings of child's academic skills*		
Below or far below average	77.5	22.5
Average	89.1	10.9
Above or far above average	92.9	7.1
Teacher ratings of number of friends compared to classmates*		
Fewer or far fewer than most	75.1	25.0
As many as most	87.7	12.3
More or far more than most	90.7	9.3

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

Parent and teacher ratings of ease of transition significantly differed by teacher ratings of the number of friends a child had relative to his/her peers ( $p < .001$  for both parents and teachers). For example, children rated by their teachers as having *fewer* or *far fewer* friends (25%,  $S.E. = 2.5$ ) were significantly more likely than those with *as many as most*, (12%,  $S.E. = 2.0$ ) ( $t = -3.73, p < .001$ ) and those with *more or far more than most* (9%,  $S.E. = 3.5$ ) ( $t = -3.35, p = .001$ ) to have had a *somewhat* or *very hard* transition, based on parent report (see table 17). Children rated by their teachers as having *fewer* or *far fewer* friends (32%,  $S.E. = 3.4$ ) were significantly more likely than those with *as many* friends as most (8%,  $S.E. = 1.0$ ) ( $t = -6.5, p < .001$ ) and *more or far more than most* (5%,  $S.E. = 2.7$ ) ( $t = -6.5, p < .001$ ) to have had a *somewhat* or *very hard* transition, based on teacher report (see table 18).

In addition, children whose parents reported a *somewhat* or *very easy* transition had significantly higher PKBS Social Skills scores ( $M = 98.3, S.E. = 0.90$ ) than children who had a *somewhat* or *very hard* transition ( $M = 84.8, S.E. = 2.2$ ) ( $t = 6.6, p < .001$ ). Also, children whose parents reported a *somewhat* or *very easy* transition had significantly lower PKBS Problem Behavior scores ( $M = 95.1, S.E. = 0.63$ ) than children who had a *somewhat* or *very hard* transition ( $M = 108.7, S.E. = 1.6$ ) ( $t = -9.1, p < .001$ ).<sup>21</sup>

<sup>21</sup> Lower scores on the PKBS Problem Behavior Scale indicate fewer problem behaviors.

**Table 18. Percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by child characteristics**

	Ease of transition: teacher report	
	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>	85.1	14.9
Teacher ratings of child's academic skills*		
Below or far below average	79.6	20.4
Average	88.7	11.3
Above or far above average	92.4	7.6
Teacher ratings of number of friends compared to classmates*		
Fewer or far fewer than most	68.4	31.6
As many as most	92.4	7.6
More or far more than most	94.8	5.2

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

### ***Involvement and Support***

***Support for kindergarten transition.*** Differences in parent and teacher report on ease of transition by parent or school involvement for children participating in PEELS were examined. Parents were asked whether they had initiated anything to help facilitate the transition to kindergarten or whether the school had done so. Neither parent nor teacher perception of the ease of transition was significantly related to whether family members initiated support to facilitate the transition ( $p = .482$  for parents,  $p = .497$  for teachers) (see tables 19 and 20). However, significantly more parents and teachers reported that the transition was *somewhat easy* or *very easy* when the school had initiated support to facilitate the transition than when the school had not taken any steps to facilitate the transition ( $p < .001$  for parents,  $p = .014$  for teachers). Kindergarten teachers were asked about their overall extent of involvement in the transition process. Ease of transition based on parent report did not vary by the teacher's level of involvement in transition planning ( $p = .219$ ) (see table 19). However, ease of transition based on teacher report and the teacher's level of involvement in transition planning was statistically significant ( $p = .003$ ) (see table 20).

***Types of kindergarten transition support provided by schools and programs.*** Schools may use a variety of techniques to facilitate children's transition to kindergarten. For example, 76 percent of kindergarten teachers in a national sample reported having parents visit the school and holding a parent orientation, and 4 percent reported conducting a home visit (Shulting, Malone, and Dodge 2005). Pianta, Cox, Taylor and Early (1999) found that 95 percent of kindergarten teachers talked with parents *after* the start of school and 11 percent of kindergarten teachers called the child's parents before the start of school. Teachers of children participating in PEELS were asked to indicate which of 11 transition strategies were used before the child started in the program (see table 21). Over 80 percent of children's kindergarten

teachers reported receiving the child’s records (e.g., paper or electronic files) from the previous program (87%, *S.E.* = 1.2), encouraging parents and guardians to meet the child’s new staff (86%, *S.E.* = 1.8), and receiving information (e.g., communicated verbally or informally) about the child from the sending program (83%, *S.E.* = 1.3). Kindergarten teachers reported using similar transition practices regardless of the setting where the child received prior services. However, kindergarten teachers of children who attended preschool programs in the same school reported significantly greater use of 4 of the 11 transition practices than children who attended some other program or had been at home: receiving children’s previous records ( $p = .006$ ), the sending program providing information about the child ( $p < .001$ ), someone from the current program meeting with staff of the sending program ( $p < .001$ ), and someone from the program visiting the child’s previous setting ( $p < .001$ ), (see table 21).

**Table 19. Percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by involvement and support**

	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>	84.2	15.8
Family initiation of action to support transition		
Family initiated action to support transition	84.9	15.1
Family did not initiate action to support transition	82.1	18.0
School initiation of action to support transition*		
School initiated action to support transition	87.2	12.8
School did not initiate action to support transition	72.7	27.3
Teacher involvement in planning		
Teacher not at all involved in planning	82.3	17.7
Teacher somewhat involved in planning	87.2	12.8
Teacher extensively involved in planning	81.0	19.1
Adequacy of teacher support*		
Teacher support was very adequate or no support needed	86.0	14.0
Teacher support was somewhat adequate	83.2	16.8
Teacher support was not very or not at all adequate	54.1	45.9
Adequacy of support provided to child*		
Very adequate support provided to child or no support needed	85.6	14.4
Somewhat adequate support provided to child	76.6	23.4
Not very or not at all adequate support provided to child	68.7	31.3

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Table 20. Percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by involvement and support**

	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>	85.1	14.9
Family initiation of action to support transition		
Family initiated action to support transition	85.1	14.9
Family did not initiate action to support transition	82.8	17.2
School initiation of action to support transition*		
School initiated action to support transition	86.1	13.9
School did not initiate action to support transition	78.0	22.0
Teacher involvement in planning*		
Teacher not at all involved in planning	80.8	19.2
Teacher somewhat involved in planning	91.0	9.0
Teacher extensively involved in planning	86.1	13.9
Adequacy of teacher support*		
Teacher support was very adequate or no support needed	88.2	11.9
Teacher support was somewhat adequate	83.7	16.4
Teacher support was not very or not at all adequate	55.8	44.2
Adequacy of support provided to child*		
Very adequate support provided to child or no support needed	87.2	12.8
Somewhat adequate support provided to child	79.8	20.2
Not very or not at all adequate support provided to child	63.9	36.2

\* The chi-square analysis result was significant at  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Table 21. Percentage of young children who received preschool special education services whose kindergarten teachers used various strategies to help them transition into kindergarten, by characteristics of the setting and respondent**

Characteristics of the setting and respondent					
	<b>Total</b>	Preschool class in same school	Some other program or at home	Regular education teacher	Special education teacher
Received children's previous records	87.1	91.0	85.0*	84.4	94.4*
Parents/guardians encouraged to meet new staff	86.3	88.2	82.8	82.9	89.8
Sending programs provided information about children	82.8	89.6	78.5*	78.5	91.7*
Children's families visited the classroom or school	78.6	80.7	77.5	80.8	71.9*
Provided parents with written information	75.0	76.8	73.7	79.0	61.7*
Participated in children's IEP development	63.3	65.7	59.6	57.4	69.2*
Met with staff of sending programs	58.8	67.5	49.7*	49.5	72.4*
Called the children's parents	54.8	51.8	54.0	46.8	65.0*
Developed child-specific preparatory strategies	53.7	53.4	52.3	47.3	64.4*
Visited children's previous settings	43.1	62.4	31.0*	37.4	56.3*
Visited children's home	10.3	16.6	7.6	9.6	15.4

\*The result of the chi-square analysis was significant at the  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

In PEELS, it is possible to compare kindergarten teachers who self-identify as either a special education or regular education teacher. Special education and regular education teachers differed significantly in their use of 9 of the 11 transition strategies. For example, special education teachers were more likely than regular education teachers to report that someone from the kindergarten program met with staff of the sending program ( $p < .001$ ), and someone from the kindergarten program visited the child's previous setting ( $p < .001$ ). Special education teachers were significantly less likely than regular education teachers to provide parents with written information ( $p = .008$ ) and to have children's families visit the classroom or school ( $p = .017$ ) (see table 21).

**Number of strategies used.** Shulting, Malone, and Dodge (2005) explored the relationship between kindergarten transition practices and child outcomes using data from a nationally representative dataset, the Early Child Longitudinal Study–Kindergarten Cohort (<http://nces.ed.gov/ECLS/kindergarten.asp>). A positive relationship was found between number of kindergarten transition practices and academic achievement, even when controlling for socioeconomic status (SES) and other demographic characteristics. Moreover, there was a positive association between transition practices and parent involvement in school activities which, in turn, was positively associated with child achievement.

In PEELS, kindergarten teachers reported using a mean of 5.4 ( $S.E. = 0.2$ ) different transition supports for the young children transitioning into their classrooms. There were no significant differences between the number of supports used for male or female children ( $p = .071$ ), by race/ethnicity ( $p = .061$ ), or by household income ( $p = .285$ ).

The number of supports used by kindergarten teachers varied significantly by district size ( $p = .018$ ), metropolitan status ( $p = .016$ ) (that is, urban, suburban or rural), and district wealth ( $p = .001$ ). As shown in table 22, 40 percent ( $S.E. = 3.7$ ) of teachers in very large districts reported using six or more transition supports, compared to 58 percent ( $S.E. = 4.8$ ) ( $t = 2.94$ ,  $p = .005$ ) of teachers in medium districts. Significantly fewer teachers (32%,  $S.E. = 4.1$ ) from very low wealth districts reported using six or more strategies than teachers from high wealth districts (52%,  $S.E. = 3.6$ ) ( $t = -3.62$ ,  $p = .001$ ).

Several teacher-related variables were also considered in relation to the amount of support that teachers provided to students entering their class. Activities are listed in table 21, such as calling the child's parents, visiting the child's home, and meeting with staff of the sending program. Special education teachers reported using significantly more supports ( $M = 6.3$ ,  $S.E. = 0.26$ ) than general education teachers ( $M = 5.1$ ,  $S.E. = 0.15$ ;  $t = -5.1$ ,  $p < .001$ ). Teachers reporting a *somewhat* or *very easy* transition used significantly more supports ( $M = 5.5$ ,  $S.E. = 0.16$ ) than teachers reporting that the child had a *somewhat* or *very difficult* transition ( $M = 4.9$ ,  $S.E. = 0.27$ ;  $t = 2.2$ ,  $p = .035$ ). Teachers were significantly more likely to use more supports when children transitioned from a preschool program within the same school ( $M = 6.0$ ,  $S.E. = 0.25$ ) compared to those who came from a different program ( $M = 5.1$ ,  $S.E. = 0.14$ ;  $t = 3.9$ ,  $p < .001$ ).

**Table 22. Percentage of young children who received preschool special education services and the number of supports used by their kindergarten teachers during the transition to kindergarten, by district factors**

	0 or 1 support	2 or 3 supports	4 or 5 supports	6 or more supports
<b>Total</b>	7.3	21.6	22.7	48.4
District size*				
Very large	10.5	29.3	20.6	39.7
Large	10.5	24.2	20.1	45.2
Medium	4.3	18.4	19.7	57.6
Small	5.4	16.9	28.8	49.0
Metropolitan status*				
Urban	10.8	26.2	18.8	44.1
Suburban	6.7	20.7	22.5	50.2
Rural	3.9	17.1	28.4	50.6
District wealth*				
High	4.5	16.9	26.4	52.2
Medium	4.0	16.8	21.7	57.4
Low	8.6	25.4	19.8	46.3
Very Low	14.8	30.4	22.4	32.4

\*The result of the chi-square analysis was significant at the  $p < .05$  level.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

## Summary

Young children with disabilities undergo many transitions during their early school years. These changes include moving from one program to another, from one grade to another, and in some cases, changing both at the same time. Despite these transitions, the number of services children receive is relatively stable as they move from one program to another. However, transitions are a time when eligibility is often reviewed (Walker et al. 1988), and findings from PEELS support this. In PEELS, significantly more children who move from preschool to kindergarten are declassified during these periods than children who make no grade transition. School readiness skills have been proposed to play a role in the ease with which children transition to kindergarten (McIntyre et al. 2006; Zill and West 2001). This was confirmed in PEELS. The ease of transition, according to parents and teachers, varied by child characteristics, such as severity of impairment, academic ability, and social skills. Parent report of perceived ease of transition also varied by race/ethnicity and family income. Parent and teacher report of ease of transition varied depending on 1) whether the school initiated actions to facilitate the transition process and 2) how much support was provided to teachers. Finally, the data on transitions to kindergarten indicate that teachers of children with disabilities used a variety of strategies to facilitate this transition; the number of strategies differed depending on whether the teacher was a regular or special education teacher.

## Chapter 4: Social Behavior of Young Children With Disabilities

Research has demonstrated a relationship between social skills/behavior and achievement. For example, children with social skills deficits and problematic behaviors tend to do less well in school (Raver 2003). Higher levels of aggressive behavior, including physical aggression, hostility, or threatening acts, are associated with lower emergent literacy scores among preschoolers (Doctoroff, Greer, and Arnold 2006). Attention problems have also been found to be related to children's academic achievement (Duncan et al. 2007). In a study of children's socio-emotional functioning and mathematical skills, attention problems were negatively correlated with math skills (Dobbs, Doctoroff, Fisher, and Arnold 2006). Children with emotional/behavioral disorders often demonstrate deficits in academic performance, have lower graduation rates, and are less likely to attend postsecondary institutions than children identified as having other disabilities (Lane, Barton-Arwood, and Wehby 2008; Nelson 2004). A meta-analytic review of 25 studies found a difference (a mean effect size of -0.69) in academic achievement between students with emotional/behavior disorders and peers without disabilities (Reid et al. 2004).

Using PEELS data, several aspects of children's social skills and behaviors were examined. First, data on children's social skills and problem behaviors, including scale scores from the SSRS, which are based on teachers' reports of children's social and behavioral skills,<sup>22</sup> as well as individual items from the parent interview are presented. Second, the relationship between teachers' ratings to parents' views on their children's social skills and behaviors is explored. Finally, the social skills and problem behaviors of children with disabilities are compared to children who had at one time been identified as having a disability, but were no longer eligible for special education.

### Social Skills Rating System

To measure children's social skills and problem behaviors, two scales from the SSRS were included in the PEELS teacher questionnaires. The Social Skills Scale measures the following positive social behaviors: cooperation, empathy, assertion, self-control, and responsibility. A higher rating on the Social Skills Scale indicates a higher level of social adjustment. The Problem Behaviors Scale assesses externalizing problems, such as aggressive acts and poor temper control; internalizing problems, such as sadness and anxiety; and hyperactivity, such as fidgeting and impulsive acts. A higher score on the Problem Behaviors Scale indicates more problematic behaviors. For both scales, teachers are asked to rate how frequently the identified child exhibited a series of skills or behaviors during the previous month or two. The measurement scale consists of three points, labeled 0, *never*; 1, *sometimes*; and 3, *very often*. The raw scores are converted to standard scores that are based on a distribution with a population mean of 100 and a standard deviation of 15 (Gresham and Elliott 1990). Separate norms are provided for males and females; therefore, all of the SSRS tables in this report provide information for males and females separately. Norms are also provided by age. Data from the Social Skills Scale will be discussed first, followed by data from the Problem Behaviors Scale.

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<sup>22</sup> The Social Skills Rating System was included in the teacher questionnaires for the first time during the Wave 3 data collection. The Preschool and Kindergarten Behavior Scales (PKBS) were included in the teacher questionnaires for Waves 1 and 2. The PKBS could not be used in Wave 3 since it is designed for use with preschool and kindergarten children 3 to 6 years of age, and most of the children in Cohort C were 7 years old and in elementary school.

## Social Skills

**Scores by gender.** The mean ratings on the Social Skills Scale were 94.1 (*S.E.* = 0.5) for males and 93.1 (*S.E.* 1.1) for females. The mean ratings did not differ significantly by gender ( $t = .80, p = .428$ ).

**Scores by disability.** Children's scores on the Social Skills Scale varied significantly by disability for males ( $F = 27.26, p < .001$ ) and females ( $F = 14.01, p < .001$ ) (see table 23). For example, the mean score for males with mental retardation ( $M = 77.7, S.E. = 1.8$ ) on the Social Skills Scale was significantly lower than scores for male children in all other disability categories, except autism ( $M = 83.1, S.E. = 2.0$ ). The mean score for females with speech or language impairments ( $M = 97.8, S.E. = 1.3$ ) on the Social Skills Scale was significantly higher than scores for female children in all disability categories except learning disabilities ( $M = 91.0, S.E. = 2.9$ ), orthopedic impairments ( $M = 94.3, S.E. = 2.9$ ), and low incidence disabilities ( $M = 85.7, S.E. = 8.4$ ).

**Table 23. Mean teacher ratings of young children who received preschool special education services on the Social Skills Scale of the Social Skills Rating System, by disability and gender: School year 2005-06**

	Total	AU	DD	ED	LD	MR	OI	OHI	SLI	LI
Males	94.1	83.1	89.7	87.2	95.6	77.7	95.9	92.1	97.8	86.3
Females	93.1	77.1	84.7	81.3	91.0	74.4	94.3	85.3	97.8	85.7

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence. Because scores for males and females were scaled separately, comparisons between them may be inappropriate. SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Problem Behaviors Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

## Problem Behaviors

**Scores by gender.** The mean ratings for young children who received preschool special education services on the SSRS Problem Behaviors Scale were 102.9 (*S.E.* = 0.4) for males and 103.5 for females (*S.E.* = 0.6). The mean ratings did not differ significantly by gender ( $t = -0.78, p = .441$ ).

**Scores by disability.** Children's scores on Problem Behaviors varied significantly by disability for males ( $F = 18.67, p < .001$ ) and females ( $F = 10.24, p < .001$ ) (see table 24). Scores for males with an emotional disturbance ( $M = 121.3, S.E. = 1.8$ ) were significantly higher than scores for male children with all other disabilities. Scores for females with an emotional disturbance ( $M = 121.5, S.E. = 2.1$ ) were significantly higher than scores for female children with all other disabilities, except autism ( $M = 115.1, S.E. = 2.1$ ).

**Table 24. Mean teacher ratings of young children who received preschool special education services on the Problem Behaviors Scale of the Social Skills Rating System, by disability and gender: School year 2005-06**

	Total	AU	DD	ED	LD	MR	OI	OHI	SLI	LI
Males	102.9	109.6	106.6	121.3	104.5	108.1	96.5	104.2	100.7	102.1
Females	103.5	115.1	109.1	121.5	105.7	109.1	102.7	108.0	100.7	99.5

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence. . Because scores for males and females were scaled separately, comparisons between them may be inappropriate. SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Problem Behaviors Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

### Parent Report of Social Skills and Problem Behaviors

The parent interview included items related to parents' perceptions of their children's social skills and behavior. It included items on children's ability to play with others; engagement in everyday activities; aggression, attention, activity regulation; and appropriateness of behavior. The sections below present data on parents' perceptions of their children's behavior in these areas. Dependent sample *t*-tests were conducted to determine statistically significant changes between 2003-04 and 2005-06 in the percentage of parents who reported that their children exhibited those behaviors by age cohort. In 2003-04, children in Cohort A were 3 years old, children in Cohort B were 4 years old, and children in Cohort C were 5 years old.

#### ***Ability to Play With Other Children***

Parents of young children who received special education services were asked how much trouble their children had playing with other children. Response options included: *no* trouble playing with other children, *some* trouble playing with other children, and *a lot* of trouble playing with other children. There were no statistically detectable differences in the percentage of parents who reported that their children had *no* trouble, *some* trouble, or *a lot* of trouble playing with other children between 2003-04 and 2005-06 (see table 25). Although there were no significant changes for the overall group, the percentage of parents who reported that their children had *no* trouble playing with other children increased significantly, from 47 percent (*S.E.* = 1.8) to 56 percent (*S.E.* = 1.7) ( $t = 5.04, p < .001$ ) and 54 percent (*S.E.* = 2.0) to 59 percent (*S.E.* = 2.1) ( $t = 2.14, p = .04$ ), for Cohort A and B, respectively. Additionally, for Cohort A, the percentage of parents who reported that their children had *some* trouble and *a lot* of trouble decreased significantly, from 42 percent (*S.E.* = 1.7) to 35 percent (*S.E.* = 1.8) ( $t = -3.45, p = .001$ ) and 10 percent (*S.E.* = 0.9) to 8 percent (*S.E.* = 1.2) ( $t = -2.14, p = .04$ ), respectively.

**Table 25. The percentage of young children who received preschool special education services whose parents reported that they have trouble playing with other children, by age cohort and school year: School years 2003–04 and 2005–06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
No trouble	56.2	58.6	0.090	1.72
Some trouble	33.8	32.5	0.522	-0.64
A lot of trouble	10.0	8.8	0.267	-1.12
<b>Cohort A</b>				
No trouble*	47.3	56.3	0.000	5.04
Some trouble*	42.2	35.4	0.001	-3.45
A lot of trouble*	10.4	8.3	0.037	-2.14
<b>Cohort B</b>				
No trouble*	54.0	59.1	0.036	2.14
Some trouble	35.6	31.2	0.095	-1.70
A lot of trouble	10.3	9.7	0.614	-0.51
<b>Cohort C</b>				
No trouble	62.9	59.6	0.261	-1.13
Some trouble	27.5	32.2	0.230	1.21
A lot of trouble	9.5	8.2	0.559	-0.59

\* *t*, *p* < .05.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

### **Engagement in Activities**

Parents were asked the extent to which their children were easily involved in everyday things that went on at home, like playing with toys or paying attention to conversations. Parents could respond that their children were *very easily* involved, *somewhat* involved, or *not easily* involved in everyday things that went on at home. There was a statistically significant increase in the percentage of parents who reported that their children were *very easily* involved in everyday things that went on at home, from 54 percent (*S.E.* = 1.3) in 2003-04 to 57 percent (*S.E.* = 1.3) in 2005-06 ( $t = 2.24$ ,  $p = .03$ ) (see table 26). There was a statistically significant increase in the percentage of parents for Cohort C who reported that their children were *very easily* involved in everyday things, from 54 percent (*S.E.* = 2.3) in 2003-04 to 58 percent (*S.E.* = 2.3) in 2005-06 ( $t = 2.06$ ,  $p = .04$ ); however, this was not true for the other age cohorts. Additionally, the percentage of parents for Cohort C who reported that their children were *somewhat* involved in everyday things decreased significantly, from 36 percent (*S.E.* = 2.2) in 2003-04 to 31 percent (*S.E.* = 1.8) in 2005-06 ( $t = -2.12$ ,  $p = .04$ ). There were no other statistically detectable differences.

**Table 26. The percentage of young children who received preschool special education services whose parents reported that they were easily involved in everyday things that went on at home, by age cohort and school year: School years 2003–04 and 2005-06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
Very easily involved*	53.6	56.8	0.029	2.24
Somewhat involved	35.4	32.9	0.063	-1.89
Not easily involved	11.0	10.2	0.364	-0.92
<b>Cohort A</b>				
Very easily involved	50.1	52.8	0.212	1.26
Somewhat involved	40.6	37.1	0.192	-1.32
Not easily involved	9.3	10.1	0.610	0.51
<b>Cohort B</b>				
Very easily involved	55.6	57.7	0.406	0.84
Somewhat involved	32.0	32.1	0.972	0.04
Not easily involved	12.4	10.2	0.114	-1.60
<b>Cohort C</b>				
Very easily involved*	53.6	58.3	0.044	2.06
Somewhat involved*	35.9	31.4	0.038	-2.12
Not easily involved	10.4	10.3	0.907	-0.12

\* *t*, *p* < .05.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

## Aggression

Parents of young children who received special education services were asked how often their children were aggressive with other children. Response options included: *not at all* physically aggressive with other children, *sometimes* physically aggressive with other children, or *often* physically aggressive with other children. There was a statistically significant change in aggression levels between 2003-04 and 2005-06. In 2003-04, 43 percent (*S.E.* = 1.2) of parents reported that their children were *not at all* aggressive; in 2005-06, that figure was 52 percent (*S.E.* = 1.5) (*t* = 5.67, *p* < .001). The percentage of parents who reported that their children were *sometimes* aggressive and *often* aggressive decreased from 51 percent (*S.E.* = 1.2) to 43 percent (*S.E.* = 1.5) (*t* = -4.20, *p* < .001) and 6 percent (*S.E.* = 0.6) to 5 percent (*S.E.* = 0.6) (*t* = -2.61, *p* = .01), respectively. For all age cohorts, there was also a statistically significant increase in the percentage of parents who reported their children were *not at all* aggressive (see table 27).

**Table 27. The percentage of young children who received preschool special education services whose parents reported that they were not at all, sometimes, or often aggressive with other children, by age cohort and school year: School years 2003–04 and 2005-06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
Not at all aggressive*	42.8	52.1	0.000	5.67
Sometimes aggressive*	50.8	43.3	0.000	-4.20
Often aggressive*	6.4	4.6	0.011	-2.61
<b>Cohort A</b>				
Not at all aggressive*	37.0	46.8	0.000	4.57
Sometimes aggressive*	54.3	47.4	0.002	-3.20
Often aggressive*	8.6	5.8	0.012	-2.58
<b>Cohort B</b>				
Not at all aggressive*	41.2	54.3	0.000	6.41
Sometimes aggressive*	52.1	40.1	0.000	-5.75
Often aggressive	6.8	5.7	0.265	-1.12
<b>Cohort C</b>				
Not at all aggressive*	47.4	53.0	0.035	2.16
Sometimes aggressive	47.6	44.0	0.245	-1.17
Often aggressive	4.9	3.0	0.164	-1.41

\* *t*, *p* < .05.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

### **Attention Regulation**

Parents of young children who received special education services were asked to what extent their children were good at paying attention to things and staying focused on what they were doing. Response options were that their children were *very* good at paying attention, *somewhat* good at paying attention, or *not at all* good at paying attention. There were no statistically detectable differences in parent report of children's ability to pay attention between 2003-04 and 2005-06 for the overall group, nor for any age cohort (see table 28). For instance, the percentage of parents who reported that their children were *very* good at paying attention was 29 percent in 2003-04 (*S.E.* = 2.0) and 29 percent in 2005-06 (*S.E.* = 1.2).

### **Activity Regulation**

Parents of young children who received preschool special education services were also asked to what extent their children were restless, fidgeted a lot, and had trouble sitting still. Response options included: *very* restless, *somewhat* restless, and *not at all* restless. There were no statistically detectable differences in parent report of children's activity regulation between 2003-04 and 2005-06 for the overall group, nor for any age cohort (see table 29).

**Table 28. The percentage of young children who received preschool special education services whose parents reported that they were good at paying attention and staying focused on what they were doing, by age cohort and school year: School years 2003–04 and 2005-06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
Very good at paying attention	29.1	29.1	0.981	-0.02
Somewhat good at paying attention	42.1	44.4	0.436	0.78
Not at all good at paying attention	28.8	26.6	0.237	-1.19
<b>Cohort A</b>				
Very good at paying attention	28.5	30.3	0.397	0.85
Somewhat good at paying attention	44.6	43.9	0.749	-0.32
Not at all good at paying attention	26.9	25.9	0.652	-0.45
<b>Cohort B</b>				
Very good at paying attention	29.7	29.9	0.953	0.06
Somewhat good at paying attention	39.9	44.2	0.277	1.10
Not at all good at paying attention	30.4	25.9	0.172	-1.38
<b>Cohort C</b>				
Very good at paying attention	28.9	27.6	0.730	-0.35
Somewhat good at paying attention	42.8	44.8	0.666	0.43
Not at all good at paying attention	28.3	27.6	0.796	-0.26

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

**Table 29. The percentage of young children who received preschool special education services whose parents reported that they were restless, fidgeted a lot, and had trouble sitting still, by age cohort and school year: School years 2003–04 and 2005–06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
Very restless	34.6	33.4	0.347	-0.95
Somewhat restless	33.8	34.8	0.459	0.75
Not at all restless	31.7	31.8	0.915	0.11
<b>Cohort A</b>				
Very restless	35.4	34.0	0.544	-0.61
Somewhat restless	32.3	35.4	0.190	1.33
Not at all restless	32.3	30.5	0.242	-1.18
<b>Cohort B</b>				
Very restless	31.2	30.6	0.770	-0.29
Somewhat restless	34.4	37.6	0.206	1.28
Not at all restless	34.4	31.8	0.231	-1.21
<b>Cohort C</b>				
Very restless	37.3	35.7	0.536	-0.62
Somewhat restless	33.9	31.8	0.458	-0.75
Not at all restless	28.8	32.5	0.143	1.48

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

### **Appropriateness of Behavior**

Parents of young children who received special education services were also asked how appropriate they felt their child's behavior was compared with other children about the same age. Response options included: *age appropriate*, *mildly* inappropriate, *moderately* inappropriate, and *severely* inappropriate. There was a statistically significant change in parent report of the appropriateness of their child's behavior compared with other children about the same age between 2003-04 and 2005-06 (see table 30). The percentage of parents who reported that their children's behavior was *age appropriate* increased significantly, from 58 percent (*S.E.* = 1.1) in 2003-04 to 61 percent (*S.E.* = 1.7) in 2005-06 ( $t = 2.66, p = .01$ ). There was no statistically significant change in the percentage of parents who reported that their child's behavior was *mildly* inappropriate (2003-04: *M* = 23.3, *S.E.* = 1.0; 2005-06: *M* = 23.9, *S.E.* = 1.6) ( $t = 0.36, p = .72$ ), *moderately* inappropriate (2003-04: *M* = 13.9, *S.E.* = 0.8; 2005-06: *M* = 11.4, *S.E.* = 1.0) ( $t = 2.07, p = .04$ ), or *severely* inappropriate (2003-04: *M* = 4.6, *S.E.* = 0.5; 2005-06: *M* = 3.4, *S.E.* = 0.5) ( $t = -2.10, p = .04$ ) between 2003-04 and 2005-06.

**Table 30. The percentage of young children who received preschool special education services whose parents reported their behavior was appropriate for their age, by age cohort and school year: School years 2003–04 and 2005-06**

	2003-04	2005-06	<i>p</i> value	<i>t</i> value
<b>Total</b>				
Age appropriate*	58.2	61.4	0.010	2.66
Mildly inappropriate	23.3	23.9	0.719	0.36
Moderately inappropriate	13.9	11.4	0.042	-2.07
Severely inappropriate	4.6	3.4	0.040	-2.10
<b>Cohort A</b>				
Age appropriate	56.7	57.7	0.676	0.42
Mildly inappropriate	23.2	24.4	0.570	0.57
Moderately inappropriate	16.2	12.9	0.061	-1.91
Severely inappropriate	4.0	5.0	0.265	1.12
<b>Cohort B</b>				
Age appropriate*	58.3	64.4	0.007	2.82
Mildly inappropriate	23.4	20.2	0.151	-1.45
Moderately inappropriate	14.1	11.3	0.134	-1.52
Severely inappropriate	4.2	4.1	0.882	-0.15
<b>Cohort C</b>				
Age appropriate	59.0	60.6	0.554	0.60
Mildly inappropriate	23.3	27.0	0.232	1.21
Moderately inappropriate	12.5	10.6	0.393	-0.86
Severely inappropriate*	5.2	1.8	0.000	-3.80

\* *t*, *p* < .05.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006).

## Comparing Parents' Reports With Teachers' Reports of Social Behavior

In this section, the relationship between parents' perceptions of their children's social skills and behavior with teachers' ratings of children's social skills and problem behaviors is explored. Several studies have found agreement, ranging from  $r = 0.17$  to  $r = 0.38$ , between parents' and teachers' ratings of children's behavioral/emotional problems (Achenbach, McConaughy, and Howell 1987; Kolko and Kazdin 1993; Verhulst and Akkerhuis 1989; Winsler and Wallace 2002). However, one study found that agreement between parents and teachers was higher for children in special education than for children in regular education ( $r = 0.57$  compared to  $r = 0.30$ ) (Verhulst and Akkerhuis 1989).

Two scales that comprise both individual items from the parent interview and the two SSRS scales were compared. The correlation between the behavior scale developed from 29 items on the PEELS parent interview and the SSRS Problem Behaviors Scale (which included 18 items) was examined. The correlation between the parent interview Social Relations at School Scale (which included

six items from the parent interview) and the SSRS Social Skills Scale (which included 30 items) was also examined. (Refer to chapter 2 of this report for more information on the construction of the scales as well as a description of the parent interview items that were included in each scale.)

Findings from PEELS are consistent with prior research. The agreement between parents' perceptions of their children's social skills and behavior and teachers' ratings of children's social skills and behavior ranged from 0.06 to -0.52 (see table 31). The correlation between parent's perceptions and teachers' ratings on males' social skills was 0.12 ( $p < .001$ ); the correlation for females was not statistically significant ( $r = 0.06, p = .28$ ). The correlation between parents' perceptions and teachers' ratings on males' problem behaviors ( $r = -0.390, p < .001$ ) and females' ( $r = -0.524, p < .001$ ) were both statistically significant. The correlations were negative because a higher score on the parent interview scale indicates more age-appropriate behaviors and a higher score on the Problem Behaviors Scale indicates more problematic behaviors.

### Declassification in Relation to Children's Social Skills and Problem Behaviors

To examine differences in social skills and behaviors by special education eligibility status, the SSRS scores of children with an IEP or IFSP in school year 2005-06 were compared to children who at one time had an IEP or IFSP, but no longer had one in 2005-06.<sup>23</sup> Children's scores on the Social Skills Scale varied significantly by declassification status for males ( $F = 19.719, p < .001$ ) and females ( $F = 10.341, p < .001$ ) (see table 32). The mean score for males who had an IEP all 3 years ( $M = 92.8, S.E. = 0.8$ ) was significantly lower compared to males who were declassified between 2003-04 and 2004-05 ( $M = 100.1, S.E. = 1.9$ ) and males who were declassified between 2004-05 and 2005-06 ( $M = 99.6, S.E. = 1.0$ ). The mean score for females who had an IEP all 3 years ( $M = 91.0, S.E. = 1.4$ ) was significantly lower compared to females who were declassified between 2003-04 and 2004-05 ( $M = 101.5, S.E. = 2.2$ ) and females who were declassified between 2004-05 and 2005-06 ( $M = 99.9, S.E. = 2.2$ ).

**Table 31. Correlations among parents' perceptions of children's social skills and behaviors and teachers' ratings of children's social skills and behaviors, by gender: School year 2005-06**

	SSRS Social Skills Scale		SSRS Problem Behaviors Scale	
	Males	Females	Males	Females
Parent Interview Social Relations at School Scale	0.12*	0.06		
Parent Interview Behavior Scale			-0.39*	-0.52*

\*  $r, p < .05$

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (April 2006), "Problem Behaviors Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006), and "Social Skills Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

<sup>23</sup> When children first enrolled in PEELS they all had an IEP or IFSP. However, since the time of enrollment some children's IEP status has changed. In school year 2005-06, approximately 28 percent of children in PEELS had been declassified or no longer had an active IEP or IFSP.

**Table 32. Mean teacher ratings of young children who received preschool special education services on the Social Skills Scale of the Social Skills Rating System, by declassification status and gender: School year 2005-06**

	Male <sup>a</sup>	Female <sup>b</sup>
<b>Total</b>	94.6	94.1
Declassified between 2003-04 and 2004-05	100.1	101.5
Declassified between 2004-05 and 2005-06	99.6	99.9
Had an IEP in 2003-04, 2004-05, and 2005-06	92.8	91.0

<sup>a</sup>*F*, *p* < .05 for males by 3-level declassification status. <sup>b</sup>*F*, *p* < .05 for females by 3-level declassification status.

NOTE: No comparisons were made between males and females.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Social Skills Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

Males who had IEPs all 3 years had significantly higher scores on the SSRS Problem Behaviors Scale (i.e., more problem behaviors) than males who had IEPs for only 1 or 2 years ( $F = 15.682, p < .001$ ) (see table 33). The mean score for males who had an IEP all 3 years ( $M = 103.8, S.E. = 0.6$ ) was significantly higher compared to males who were declassified between 2003-04 and 2004-05 ( $M = 99.3, S.E. = 1.6$ ) and males who were declassified between 2004-05 and 2005-06 ( $M = 98.8, S.E. = 0.9$ ). For females, there was no statistically detectable difference on the Problem Behaviors Scale by declassification status ( $F = 2.093, p = .132$ ).

**Table 33. Mean teacher ratings of young children who received preschool special education services on the Problem Behaviors Scale of the Social Skills Rating System, by declassification status and gender: School year 2005-06**

	Male*	Female
<b>Total</b>	102.6	103.8
Declassified between 2003-04 and 2004-05	99.3	101.1
Declassified between 2004-05 and 2005-06	98.8	100.3
Had an IEP in 2003-04, 2004-05 and 2005-06	103.8	105.2

\* *F*, *p* < .05 for males by 3-level declassification status.

NOTE: No comparisons were made between males and females.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Problem Behaviors Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

## Summary

The social skills and behaviors of young children identified as having disabilities are a concern of both teachers and parents. Mean teacher ratings on the SSRS were 102.9 for males and 103.5 for females on Problem Behaviors Scale (a higher score on the Problem Behaviors Scale indicates more problem behaviors) and 94.1 for males and 93.1 for females on the Social Skills Scale. Parents' reports indicated some concerns with their children's social skills and behaviors. However, parents reported significantly fewer behavior problems and improved social skills from school year 2003-04 to 2005-06. The agreement

between parents' perceptions of their children's social skills and behavior and teachers' ratings of children's social skills and behavior ranged from 0.06 to -0.52, which is similar to what has been found in other studies (Achenbach, McConaughy, and Howell 1987; Kolko and Kazdin 1993, Verhulst and Akkerhuis 1989; Winsler and Wallace 2002).

Young children who received special education services for three years had more problem behaviors than children who received services for only 1 or 2 years; however, this difference was statistically significant for males only. Both males and females who received services all 3 years had significantly lower social skills than children who stopped receiving special education services between 2003-04 and 2004-05 or between 2004-05 and 2005-06.

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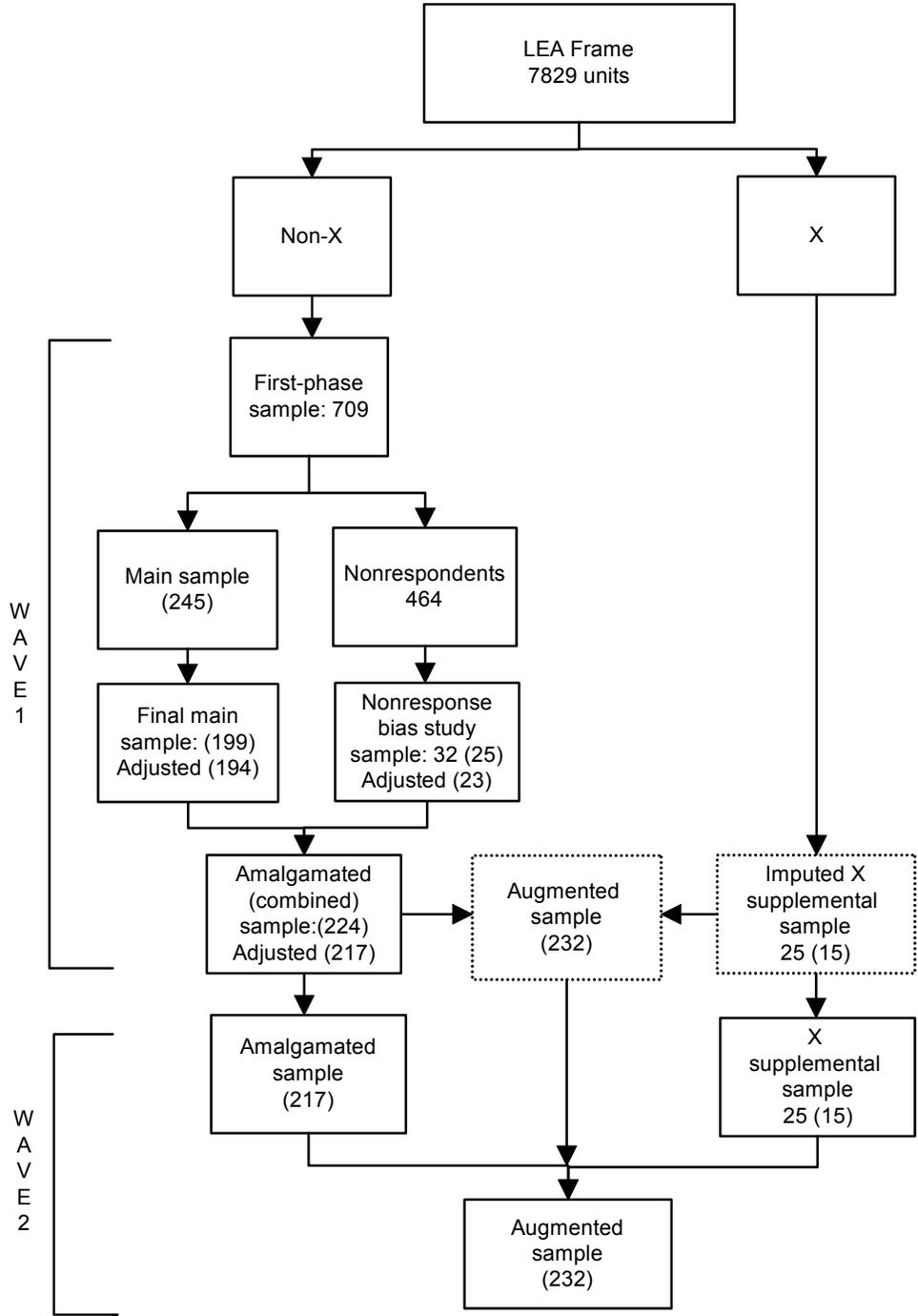
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## Appendix A: Diagram of Selection of LEA Sample



Note: X stands for the state that originally did not participate. LEA counts for X and non-X were suppressed for confidentiality reasons. The figures in parentheses are the number of participating LEAs. They were adjusted as the LEAs that did not contribute any data were dropped. The dotted boxes represent a mirror image created by imputation of the X supplemental sample selected in Wave 2.

## Appendix B: Weighting Procedures

This appendix describes weighting procedures used in Waves 1, 2, and 3 of PEELS. The PEELS study was designed to use a nationally representative sample of local education agencies (LEAs) and children 3 through 5 years of age with disabilities to generate weighted estimates that reflect the characteristics of the population, not the sample.

### District Weighting

The LEA weighting procedure includes developing base weights and replicate weights. Replicate weights were generated for each set of full-sample weights to allow the creation of estimated standard errors on all statistics.

### District Base Weights

Calculation of the base weights started with the first-stage sample of 709 LEAs for the amalgamated sample and 25 LEAs for the supplemental sample. Analysis of nonresponse patterns revealed that nonresponse adjustment to the base sampling weights for the main sample could be carried out within the design stratum cells. Therefore, district base weights were recomputed within each sampling stratum cell as the number of districts on the sampling frame divided by the number of districts that participated in the study. The sum of the base weights represents 7,829 districts.<sup>1</sup> These weights will be denoted as  $w_h$ , which is the same for all LEAs within a stratum cell (defined by district size, region, and wealth category for non-supplemental LEAs and by district size alone for supplemental sample LEAs).

### Replicate Weights

Replicate weights were developed to facilitate variance estimation using Westat's proprietary software, WesVar. Due to restrictions in the DAS software that will be used for data dissemination, the jackknife method JK2 with 62 replicates was used instead of the JK<sub>n</sub> method used previously for Wave 1 weighting.

The JK2 method requires defining the variance strata and two variance units per variance stratum. The variance strata were defined by the sampling strata by size, region, and wealth at the beginning. However, sampling strata with no or a small number of responding LEAs were collapsed with a neighboring stratum cell with similar sampling rates. Sampling strata with a large number of LEAs were split into two variance strata. Altogether, 62 variance strata were created. Variance units were formed by randomly grouping districts within each variance stratum up to three variance units. The number of groups was determined by the number of replicates.

The replicate weights were then created for the JK2 method. If there are two variance units, this is done by assigning a zero weight to records in one variance unit chosen randomly and doubling the weights for records in the other variance units from the same variance stratum but leaving the weights for records in other variance strata unchanged. If the randomly chosen variance unit from the  $i$ -th variance stratum is denoted as  $U_{i1}$  and the other variance unit as  $U_{i2}$ , algebraically the  $i$ -th replicate weight for the  $j$ -th LEA record,  $w_{ij}^*$ , is given by

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<sup>1</sup> This number is different from the total number of LEAs in the country because the smallest LEAs were not covered by the sample design.

$$w_{ij}^* = \begin{cases} 0 & \text{if the } j \text{ - th record is in } U_{i1} \\ 2w_h & \text{if the } j \text{ - th record is in } U_{i2} \\ w_h & \text{if the } j \text{ - th record is not in the } i \text{ - th variance stratum} \end{cases}$$

where  $w_h$  is the full sample base weight for the stratum cell  $h$  to which the  $j$ -th LEA belongs,  $i = 1, 2, \dots, 62; j = 1, 2, \dots, 232$ .

If there are three variance units, replicate weight calculation is more complex. In this case, another variance stratum number is needed; usually, an existing number is arbitrarily assigned. Let this be  $k$  and the three variance units be randomly ordered as  $U_{i1}$ ,  $U_{i2}$ , and  $U_{i3}$ . The replicate weight that corresponds to this situation is defined as:

$$w_{ij}^* = \begin{cases} 0 & \text{if } j \text{ - th record is in } U_{i1} \\ 1.5w_h & \text{if } j \text{ - th record is in } U_{i2} \\ 1.5w_h & \text{if } j \text{ - th record is in } U_{i3} \end{cases}$$

and

$$w_{kj}^* = \begin{cases} 1.5w_h & \text{if } j \text{ - th record is in } U_{i1} \\ 0 & \text{if } j \text{ - th record is in } U_{i2} \\ 1.5w_h & \text{if } j \text{ - th record is in } U_{i3} \end{cases}$$

Consequently, each LEA has a base weight  $w_h$  and 62 replicate weights,  $w_{1j}^*, w_{2j}^*, \dots, w_{62j}^*$ .

### **Child Weighting: Within LEA Child Base Weight**

After the child sampling was finished, the sampling status was defined by child status ID, which has 15 categories shown in table B-1.

The status codes 1, 2, and 4 are interim codes, and no child should have this code at the end of data collection in each wave. A large number of children have a status code of 3 since they were passed through the sampling system but not selected into the sample (those who were selected had a code value of 4 but subsequently moved to one of the remaining categories). Only children in category 6 are enrolled for the study. Children in categories 9 and 11 were selected first but then deselected due to the maximum 80-children limit for each district or districtwide non-participation. These and 1, 2, 8, and 12 are treated as not passed in the sampling system. Status codes 60, 61, and 62 are relevant only to the children in Waves 2 and 3.

Child sampling was done using the sampling system within sampling strata (called LEA-cohort) defined by District ID and the five cohort IDs [3-years-old ongoing (A\_O), 4-years-old ongoing (B\_O), 4-years-old historical (B\_H), 5-years-old ongoing (C\_O), 5-years-old historical (C\_H)].

**Table B-1. Child status codes**

Code	Definition	Description
1	Entering	The child record is entered into the computer system.
2	Ready sample	The child record is ready for sampling.
3	Sampled	The child record has gone through the sampling system.
4	Selected	The child record is selected into the sample.
5	Ineligible	The child is ineligible.
6	Enrolled	The child is enrolled for the study.
7	Declined	The child has declined.
8	Max reached/not sampled	The record is not sampled because the district has reached the cap of 80.
9	Max reached/deselected	The record is selected but subsequently deselected because the district has reached the cap of 80.
10	Nonresponse	The child was selected but did not respond.
11	Deselected-No LEA/child participation	The child was selected but subsequently deselected because the LEA questionnaire was not filled out nor did any child participate in the study.
12	Desampled/district nonparticipation	The child was sampled but subsequently desampled because the whole district dropped out of the study.
60	Deceased	The child died after Wave 1.
61	Ineligible	The child turned out to be ineligible after Wave 1.
62	Study withdrawal	The child withdrew from the study after Wave 1.

During reweighting it was found that nine children had incorrect birthdates. The correction of their birthdates altered their sampling LEA-cohort strata. Sampling rates of those affected LEA-cohort strata were recomputed assuming the realized strata are the real strata from which they were selected. Four children from two LEAs swapped their LEA-cohort strata within their LEAs, and thus no change in the sampling rate was necessary for them. This approach may be termed as conditional on the realized LEA-cohort strata. This may introduce some bias but will reduce the variance. The bias introduced by this approach is negligible because the number of problem cases is small, and the sampling rate changes are not great.

A within-LEA base sampling weight for children by child sampling stratum was created for all sampled and selected children (categories 5, 6, 7, 10, 60, 61, 62) based on the sampling rate. The weight for a selected child  $i$  in an LEA-cohort within LEA stratum  $h$  is defined as the inverse of the sampling rate that was applied:

$$w_{hi}^c = \frac{1}{r_{hi}}.$$

Note that the subscript  $i$  now identifies sample children, so it has a different meaning from the one used in the previous section. The sampling rate  $r_{hi}$  depends on the LEA stratum  $h$ , where the child's LEA is contained, and the child's particular LEA-cohort.

The sampling rate changed during the sampling process for many LEA-cohort strata, so children in those LEA-cohort strata were selected with a different sampling rate from that of other children in the same LEA-cohort stratum, depending on the time of sampling. Therefore, the children from the same LEA may have different base weights.

The sum of unconditional base weights in a cohort is close but not equal to the child list total of the cohort. Using a conditional approach that defines the within-LEA child weight based on the realized sample size instead of using the sampling rate was first considered. This approach cuts down the variance due to random sample sizes that resulted from the Bernoulli sampling procedure used for child sampling from the ongoing lists. However, this approach became problematic because 48 LEA-cohort strata did not have any children selected due to small sampling rates and inaccurate list size estimates used to calculate the sampling rates and also by chance. Therefore, if the conditional approach was used, children from the 48 LEA-cohort strata would not be represented. To avoid this problem, the unconditional approach and the corresponding formula given above were used.

There are two exceptions to using unconditional weights:

- First, for LEA-cohort strata that have some children in categories 1, 2, 8, and 9, the conditional weighting method was used because not all the children were covered by the unconditional weighting; that is, some children were unsampled or deselected, which makes the sampling rate used for sample selection wrong. For these cases, the conditional weight was calculated by dividing the child list total of the LEA-cohort by the actual number of children selected for the LEA-cohort:

$$w_{hi}^c = \frac{N_{hi}}{n_{hi}}.$$

The conditional weight was the same for every child and summed exactly to the list total of the LEA-cohort stratum.

- Second, after the weighting using the methods above was performed, the sum of weights against the list counts were checked, by cohort, and some large differences were found, which were mainly due to large discrepancies for the following LEA-cohorts: 1457B\_O, 1457C\_O, 3319C\_H, 3495C\_O, 1060C\_O, 2044B\_H, 2596B\_H, 1917C\_H, 1519B\_H, 3256B\_H, 9002A\_O, 9002\_B\_O, 2549C\_H, 1519A\_O, 2864B\_H, and 1472B\_H. The sampling weights were recalculated using the conditional approach for them.

With this correction, the sum of weights was almost the same as the overall list total. The weights also agree quite well at various levels of aggregation.

### **Child Base Weight**

The overall weight for the selected children was created by multiplying the child base weight and the LEA full sample weights,  $w_h$ , defined earlier:

$$w_{hi} = w_h w_{hi}^c.$$

The overall child replicate weights are then obtained by multiplying the child base weight and the LEA replicate weights.

### **Noncoverage Adjustment for Smallest LEAs**

In the PEELS sample design, size 5 (very small) LEAs were not sampled. This is because size 5 LEAs accounted for only a small percentage of the whole target population but required more resources to

sample because they are numerous. The noncoverage of size 5 children were adjusted by increasing the size 4 children's base weights by a ratio factor calculated from the original frame stratified by region and wealth. Note that only size 4 children's weights are adjusted. The adjusted weights are given by

$$w_{hi}^* = \begin{cases} w_{hi}, & \text{if size less than 4,} \\ w_{hi}f_{hi}^{\text{cov}}, & \text{if size = 4,} \end{cases}$$

where  $f_{hi}^{\text{cov}}$  is the coverage adjustment factor for size 4 LEAs. Table B-2 shows the factors by region and wealth class.

**Table B-2. Non-coverage adjustment factors**

Region	Wealth	Non-coverage factor
1	1	1.0798
1	2	1.1203
1	3	1.2089
1	4	1.4796
2	1	1.0530
2	2	1.0391
2	3	1.0517
2	4	1.0699
3	1	1.1428
3	2	1.2300
3	3	1.4222
3	4	1.5694
4	1	1.2022
4	2	1.3007
4	3	1.3887
4	4	1.4203

***Nonresponse Adjustment of Child Base Weight***

The child base weights were adjusted to compensate for the nonresponding sample children. Each of the four input datasets contain all the children who have child status ID equal to 5, 6, 7, or 10, where 5 = ineligible, 6 = enrolled, 7 = declined, and 10 = nonresponse. Only children with child status ID = 6 are enrolled in the study. The eligibility of children with status 10 was unknown for most records; however, for 182 records this could be determined by a subcoded value of child status ID (see table B-3). The weights of the enrolled children were adjusted to account for the unknown eligibility and nonresponse.

Researchers first tried to use CHAID analysis to define the adjustment cells for the main sample based on the size, region, wealth, age, and placement on the ongoing or historical lists. The stratification variables size, region, and wealth were the most significant predictors of nonresponse. The stratification cell was used as the initial nonresponse adjustment cell.

**Table B-3. Subcodes for child eligibility**

Code	Description	Eligibility
1	Received, eligibility status not reported/not known	Unknown
2	Received, eligible case, district could not reach family	Known
3	Received, eligible case, problem not resolved	Known
4	Enrollment form not received	Unknown
5	Enrollment form received late	Unknown

Since the eligibility of some children was not known, adjustment was done in two stages. First, the nonresponse status was redefined as

Status	Meaning
1	Enrolled
2	Eligible but declined
3	Ineligible
4	Nonresponse, eligibility unknown

In the first stage adjustment, the adjusted weight was  $w_{hi}^{**} = w_{hi}^* f_{hi}^{NR1}$ , where  $f_{hi}^{NR1}$  is the factor defined in the table below.  $S_j$  is defined as the sum of weights of all cases within each of the nonresponse cells. The nonresponse adjustment factor  $f_{hi}^{NR1}$  is then determined depending on the child sample status by:

Status	Adjustment factor
1	$\frac{S_1 + S_2 + S_3 + S_4}{S_1 + S_2 + S_3}$
2	$\frac{S_1 + S_2 + S_3 + S_4}{S_1 + S_2 + S_3}$
3	$\frac{S_1 + S_2 + S_3 + S_4}{S_1 + S_2 + S_3}$
4	0

In the second stage adjustment, the adjusted weight is  $w_{hi}^{***} = w_{hi}^{**} f_{hi}^{NR2}$ , where the nonresponse adjustment factor  $f_{hi}^{NR2}$  is determined as follows:

Status	Adjustment factor
1	$\frac{S_1 + S_2}{S_1}$
2	0
3	1

### **Truncation of Weight Outliers for Child Base Weights**

After nonresponse adjustment, the weight outliers were truncated within five cohorts (A\_O, B\_O, B\_H, C\_O, and C\_H). This was deemed necessary because the weights vary too much to contain the variance at a reasonable level. Sometimes a simple rule, such as the three-median rule, was used to set truncation of boundary. This rule truncates weights that are larger than three times the median weight to three times the median weight:

$$w_{hi}^{***} = \begin{cases} w_{hi}^{***}, & \text{if } w_{hi}^{***} \leq 3\text{Median}, \\ 3\text{Median}, & \text{if } w_{hi}^{***} > 3\text{Median}. \end{cases}$$

However, for some child sampling strata, the three-median rule caused too many weights to be truncated. The percentage of truncated weights was kept to less than 3 percent, so, for some child sampling strata, a three-and-a-half-median or four-median rule was used. For the children who had their full sample weight truncated, all the replicate weights were reduced by the same percentage.

### **Post-stratification of Enrolled Child Weight**

The nonresponse adjusted children's weight was further adjusted by a post-stratification procedure. The control totals for post-stratification contained the number of special education children enrolled by December 2003, by age, for each of the 50 states and the District of Columbia.

Post-stratification was necessary because several states did not have any children sampled, either because, by chance, no LEAs in those states were selected, or none of the selected LEAs in a state responded. It should be noted that the control totals are snapshot figures, while the PEELS population includes children enrolled during a certain time period. The control totals also include children from the very small (size 5) school districts, which were not covered (but were adjusted for) by the PEELS sample.

The post-strata were formed by crossing the three age groups and nine subregions formed by combining states within the same region by their geographical proximity. The size of states in terms of number of children was also taken into consideration in order to obtain similar-sized post-strata.

After the post-stratification was applied, the final enrolled children's base weight was created. This weight is called the children's base weight, although it resulted from various adjustments, because it will be the base for further nonresponse adjustments for different data collection instruments. These are discussed in the following section.

### **Parent Interview Weights**

The parent interview was attempted for all enrolled children, but some parents did not respond. The weights for the parent interview data were created by adjusting the enrolled children's base weights for parent nonresponse. The nonresponse adjustment cells were the same as the ones formed for the nonresponse adjustment to obtain the enrolled children's base weight. This worked well because the response rate for the parent interview was very high. In Waves 1 and 2 at the completion of imputation, parent interview data and corresponding weights were available for 96 percent and 93 percent, respectively, of the children in the augmented sample. In Wave 3, parent interview data and corresponding weights were available for 88 percent of the children in the augmented sample. Parent interview data and corresponding weights were available for 83 percent of the children in the augmented sample in all three waves.

## **Child Assessment Weights**

The child assessment was done in two ways. Most of the children were assessed directly, but for children who could not complete the direct assessment, an alternate assessment was conducted. Together, they represent the whole population of either directly assessable children or unassessable children. The child assessment weight was created by using the enrolled children's weights as base weights and adjusting for child nonresponse in the assessment data. The nonresponse adjustment cells were the same as the ones formed for the nonresponse adjustment to create the enrolled children's base weight. The response rate for child assessment was very high. In Waves 1 and 2 at the completion of imputation, assessment data and corresponding weights were available for 96 percent and 95 percent, respectively, of the children in the augmented sample. In Wave 3, assessment data and corresponding weights were available for 93 percent of the children in the augmented sample. Assessment data and corresponding weights were available for 83 percent of the children in the augmented sample in all three waves.

## **Teacher Weights**

The teacher questionnaire was attempted for the teachers of all enrolled children, but some teachers did not respond. The weights for the teacher questionnaire data were created by adjusting the enrolled children's base weights for teacher nonresponse. The nonresponse adjustment cells were the same as the ones formed for the nonresponse adjustment to create the enrolled children's base weight. The response rate for teachers was lower than for parents and child assessment. In Waves 1 and 2 at the completion of imputation, teacher questionnaire data and corresponding weights were available for 79 percent and 84 percent, respectively, of the children in the augmented sample. In Wave 3, teacher questionnaire data and corresponding weights were available for 81 percent of the children in the augmented sample. Teacher interview data and corresponding weights were available for 87 percent of the children in the augmented sample in two or three of the waves.

## **Parent-Child Weights**

In many analyses, both parent interview and child assessment information are needed; the parent-child weight was for children with both child assessment data and parent interview data. The enrolled children's weights were used as base weights and adjusted for the nonresponse of children in the parent-child data. The nonresponse cells were the same as the ones formed in the nonresponse adjustment for children's base weight. In Waves 1 and 2 at the completion of imputation, both parent interview and assessment data and corresponding weights were available for 92 percent and 89 percent, respectively, of the children in the augmented sample. In Wave 3, both parent interview and assessment data and corresponding weights were available for 85 percent of children in the augmented sample. Child assessment and parent interview data and corresponding weights were available for 72 percent of the children in the augmented sample in all three waves.

## **Parent-Child-Teacher Weights**

In some analyses, information from all three instruments is needed. The parent-child-teacher weight is for children with parent interview, child assessment, and the teacher questionnaire data. The enrolled children's weights were used as base weights and adjusted for the nonresponse of children in the parent-child-teacher data. The nonresponse cells were the same as the ones formed in the nonresponse adjustment for children's base weight. Because of the lower response rate in the teacher questionnaire, the response rate for the parent-child-teacher data is relatively low. In Waves 1 and 2 at the completion of imputation, child assessment, parent interview, and teacher questionnaire data and corresponding weights were available for 70 percent and 76 percent, respectively, of the children in the augmented sample. In Wave 3, child assessment, parent interview, and teacher questionnaire data and corresponding weights

were available for 72 percent of the children in the augmented sample. Child assessment, parent interview, and teacher questionnaire data and corresponding weights were available for 65 percent of the children in the augmented sample with child assessment and parent interview data in all three waves and teacher questionnaire data in two or three of the waves.

### **Use of Weights in Analysis**

Table B-4 provides a description of each weight available after Wave 3 and the analyses for which it is used. For this report, cross-tabulations with covariates from the PEELS demographics file, such as age cohort, sex, and race/ethnicity, use Wave 1, Wave 2, and Wave 3 cross-sectional weights because the demographics file has no missing data and no specific weights. Cross-tabulations with covariates from the Wave 1 files, such as household income, use Wave 1 cross-sectional weights for the Wave 1 cross-tabulations and longitudinal weights for the Wave 3 cross-tabulations because the Wave 3 cross-tabulations use data from Waves 1, 2, and 3 sources. Wave 2 cross-sectional weights were used in table columns with Wave 2 covariates or demographics analyzed with Wave 2 dependent variables. Wave 3 cross-sectional weights were used in table columns with Wave 3 covariates or demographics analyzed with Wave 3 dependent variables.

**Table B-4. Description and uses of Wave 1, Wave 2, and Wave 3 cross-source and longitudinal weight variables used in this report**

Description	Use of weight
Cross-sectional Wave 1 assessment weight	Analyses using only data from the Wave 1 assessment file
Cross-sectional Wave 2 assessment weight	Analyses using only data from the Wave 2 assessment file
Cross-sectional Wave 3 assessment weight	Analyses using only data from the Wave 3 assessment file
Longitudinal assessment weight	Analyses using only data from the assessment file, from Waves 1 and 3, or Waves 2 and 3, or all three Waves
Cross-sectional Wave 1 parent interview weight	Analyses using only data from the Wave 1 parent interview file
Cross-sectional Wave 2 parent interview weight	Analyses using only data from the Wave 2 parent interview file
Cross-sectional Wave 3 parent interview weight	Analyses using only data from the Wave 3 parent interview file
Longitudinal parent interview weight	Analyses using only data from the parent interview file, from Waves 1 and 3, or Waves 2 and 3, or all three Waves
Cross-sectional Wave 1 teacher weight	Analyses using only data from the Wave 1 teacher files
Cross-sectional Wave 2 teacher weight	Analyses using only data from the Wave 2 teacher files
Cross-sectional Wave 3 teacher weight	Analyses using only data from the Wave 3 teacher files
Longitudinal teacher weight	Analyses using only data from the teacher file, from Waves 1 and 3, or Waves 2 and 3, or all three Waves
Cross-sectional Wave 1 parent/assessment weight	Analyses using data from the Wave 1 parent interview and Wave 1 assessment files
Cross-sectional Wave 2 parent/assessment weight	Analyses using data from the Wave 2 parent interview and Wave 2 assessment files
Cross-sectional Wave 3 parent/assessment weight	Analyses using data from the Wave 3 parent interview and Wave 3 assessment files
Cross-sectional Wave 1 parent/assessment/teacher weight	Analyses using data from the Wave 1 parent interview, Wave 1 assessment, and Wave 1 teacher files
Cross-sectional Wave 2 parent/assessment/teacher weight	Analyses using data from the Wave 2 parent interview, Wave 2 assessment, and Wave 2 teacher files
Cross-sectional Wave 3 parent/assessment/teacher weight	Analyses using data from the Wave 3 parent interview, Wave 3 assessment, and Wave 3 teacher files
Longitudinal parent/assessment/teacher weight	Analyses using data from parent, assessment, <b>and</b> teacher files, from Waves 1 and 3, or Waves 2 and 3, or all three Waves
Longitudinal parent/assessment weight	Analyses using data from parent <b>and</b> assessment files, from Waves 1 and 3, or Waves 2 and 3, or all three Waves

## Appendix C: Nonresponse Bias and Related Analyses

This report presents results of a nonresponse bias analysis of PEELS Wave 1 data. The study was conducted in response to concerns about potential bias from low stage 1 response rates. As shown in table C-1, response rates were calculated by multiplying the final LEA participation rate of 31 percent<sup>1</sup> by the response rate for each instrument. As a result, terms of clearance for the Pre-Elementary Education Longitudinal Study (PEELS) (OMB #1820-0656) required the U.S. Department of Education’s Office of Special Education (OSEP) to submit to the Office of Management and Budget (OMB) a nonresponse analysis report.

**Table C-1. Two-stage response rates for each PEELS instrument**

	Wave 1	Wave 2	Wave 3
Instrument type	Response rate (%)	Response rate (%)	Response rate (%)
Parent interview	30	29	27
LEA questionnaire	26	--	--
SEA questionnaire	31	--	--
Principal/program director questionnaire <sup>a</sup>	22	24	17
Teacher mail questionnaire	24	26	25
Early childhood teacher questionnaire	24	27	25
Kindergarten teacher questionnaire	23	24	25
Elementary teacher questionnaire	--	27	25
Child assessment	30	29	29
English/Spanish direct assessment	30	30	29
Alternate assessment only	29	24	29

--Not available

<sup>a</sup> QED data were used to supplement information from the principal/program director questionnaires, bringing the percentage of participating children with some school context information in Waves 1, 2, and 3 to 94 percent, 95 percent, and 94 percent, respectively and making the two-stage response rates 29 percent for each of the three waves.

To provide the needed confidence to data users, data producers, and study sponsors, OSEP funded a small-scale sample survey of LEAs that initially did not agree to participate in PEELS (464 LEAs or 65 percent of the original LEA sample). Westat selected a random sample of 32 nonparticipating LEAs in Wave 1, allocating the sample to the existing size strata. While 25 of those LEAs agreed to participate, only 23 (72%) actually followed through with their participation, meaning they successfully

<sup>1</sup> The LEA participation rate was calculated by dividing the number of districts that recruited children (223) by the number of districts contacted during recruitment (709).

recruited one or more families.<sup>2</sup> This nonresponse study sample is roughly 10 percent of the size of the main LEA sample. Table C-2 shows the size distribution of the LEAs participating in the nonresponse study.

**Table C-2. Frequency of LEAs in PEELS by size stratum and sample type**

Size stratum	U.S.	Main sample	Nonresponse sample
<b>Total</b>	7,818	194	23
Very Large	117	33	2
Large	629	32	5
Medium	1,897	43	6
Small	5,175	86	10

The instruments and data collection procedures were exactly the same for the main and nonresponse study participants, so any differences between the two samples can be attributed to the differences in the characteristics of the subpopulations that the samples represent (main study sample and nonresponse study sample).

This nonresponse bias study has three primary research questions. They include the following:

1. Can weighted data from the main sample be produced that provides unbiased national estimates of student performance on key outcome variables?
2. Do statistical differences exist between the performances of students in participating districts and students in nonresponse study districts on key outcome variables?
3. Is student performance on key outcome variables a factor in the decision to participate or not in PEELS?

### **Methods Used to Analyze Nonresponse Bias**

The general strategy for assessing bias due to nonresponse includes three types of analyses. The first set of analyses involves comparisons between weighted data of the *main* sample versus weighted data of the *amalgamated* sample (which includes the main and nonresponse samples). The second set of analyses compares unweighted data in the main sample with the nonresponse sample. A final set of analyses involves logistic regressions using participation status as the dependent variable and child performance among the independent variables. Each of these analyses is discussed in more detail below.

The amalgamated sample, which includes the main plus nonresponse study samples, with proper weighting, will provide unbiased estimates because the amalgamated sample will represent the entire population. Statistical tests that compare these unbiased estimates and estimates obtained solely from the

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<sup>2</sup> Nonresponse may cause some bias in estimates obtained from a sample of only respondents if nonrespondents are different from respondents in terms of their characteristics of interest. Nonresponse adjustment weighting was performed so that the bias due to nonresponse is minimized. Even if the nonresponse adjustment weighting was not perfect, bias would not be serious because the response rate of 72 percent is reasonably high.

(weighted) main sample will reveal whether the main sample estimates are significantly different from the unbiased estimates. This method is referred to as the *amalgamated-main comparison*.

Nonresponse is of less concern if nonrespondents are not systematically different from the respondents in terms of the study variables. The second analysis focuses on this aspect using the super-population framework in which the two samples are assumed to be selected from hypothetical infinite populations of respondents and nonrespondents. This framework enables us to ignore the weights, simplifying the comparison. *t* tests that were performed to determine whether the differences between estimates obtained from the unweighted data are significant. This method of comparison is termed the *unweighted comparison*.

The final set of analyses involved a series of logistic regressions in which participation status (main or initial respondents versus initial nonrespondents) was predicted using child age, disability category, and assessment scores. Significant coefficients for the assessment scores would provide evidence for potential bias due to nonresponse for those variables.

It should be noted that a significant difference in the unweighted analysis does not imply that the weighted main sample would be biased for the variable in question. It simply means that bias potential is greater. It is possible to eliminate the bias potential through effective nonresponse adjustment weighting. Therefore, greater emphasis should be given to the results of the amalgamated-main comparison.

### ***Outcome Variables***

Wave 1 demographic and direct assessment data were used to analyze nonresponse bias. Among the PEELS data, the direct assessment data will characterize the performance of preschoolers with disabilities and be used to model factors affecting that performance. Further, one might expect children's assessment performances to differ for districts that initially refused to participate in PEELS relative to those that initially accepted the PEELS invitation. Participating children completed a one-on-one assessment of school readiness with a trained assessor. The assessment included the following subtests:

- preLAS 2000 Simon Says, a measure of English/Spanish language ability;
- preLAS 2000 Art Show, a measure of English/Spanish language ability;
- Peabody Picture Vocabulary Test (PPVT), a measure of receptive language ability;
- Woodcock-Johnson III: Letter-Word Identification, a measure of pre-reading skill;
- Woodcock-Johnson III: Applied Problems, a measure of practical math skills;
- Woodcock-Johnson III: Quantitative Concepts-Concepts, a measure of conceptual math skills;
- Woodcock-Johnson III: Quantitative Concepts-Number Series;
- Leiter-R Attention Sustained Scale, a measure of attention;
- Individual Growth and Development Indicators (IGDI): Picture Naming, a measure of pre-reading skills;
- IGDI: Rhyming, a measure of pre-reading skills;

- IGDI: Alliteration, a measure of pre-reading skills;
- IGDI: Segment Blending, a measure of pre-reading skills; and
- Test of Early Math Skills, a measure of general math skills.

The above measures include a combination of performance (achievement) outcomes that were expected to be sensitive to the effects of programs and services that are provided to pre-elementary children and other variables (factors) that may help to explain performance. The preLAS (Simon Says and Art Show) was used primarily to identify children needing a Spanish-language assessment rather than the direct assessment (in English). As such, these two measures were excluded from the nonresponse bias analysis. The PPVT, a measure of receptive language, is not considered to be an achievement measure. It was also excluded from the nonresponse bias analysis. Finally, the Test of Early Math Skills was thought to be largely duplicative of the several Woodcock-Johnson math measures already included in the analysis. Therefore, in order to reduce the complexity of the study, only the Woodcock-Johnson measures were used. Thus, the remaining nine measures were used in the analysis.

## Results

In the comparison of main and amalgamated sample estimates of child assessment scores, it was assumed that the estimates obtained from the amalgamated sample were unbiased because they were based on the combination of main and nonresponse samples. To address the question of whether the main sample alone, which suffers a high rate of nonresponse, can produce unbiased estimates of the child assessment variables after weighting adjustment for nonresponses, *t* tests were performed on the differences of the estimates obtained from the amalgamated sample and the main sample. If a test result was significant for a variable, the result was interpreted as evidence to indicate a potential for bias in the main sample estimates for the variable. A nonsignificant result indicated a lack of such evidence. Tables C-3 through C-5 present the test results for nine outcome performance score variables<sup>3</sup> and three additional demographic variables, including age, sex, and disability category.

In the following discussion, a 5-percent significance level was used for all tests. The test results are given in terms of the *p*-value. If a *p*-value is greater than 5 percent, the test result (i.e., the comparison being examined), to which that *p*-value applies, is not statistically significant. Thus, for a comparison yielding a *p*-value above 5 percent, the assumption is that there is no statistical difference between those means.

### *Comparisons Between the Weighted Main and Amalgamated Samples*

First, sex, age, and disability category distributions were examined as presented in table C-3. The percentage of males in the amalgamated sample is 71.5 percent, which is slightly higher than the main sample estimate of 69.8 percent. The difference is not significant, with a 31.2 percent *p*-value. The percentage of each age group is also not significantly different between the two samples. The *p*-values range from 12.7 to 84.6 percent. No significant differences in individual disability categories were detected either.

Comparison of the two estimates of each score across the age groups is shown in table C-4. Among the 11 variables, only one variable, the WJLWSCORE (Letter-Word), had a significant difference, with a *p*-value of 3.2 percent. All other *p*-values were nonsignificant. In fact, most results were

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<sup>3</sup> An Attention variable (Leiter-R) was constructed for each age group (3-, 4-, and 5-year-olds). The other eight variables were analyzed using age group as an independent variable.

quite distant from the significance level of 5 percent, with the exception of the WJQCNSCORE (Quantitative Concepts: Number Series) variable, whose  $p$ -value (6.7%) was just over 5 percent.

When the data were analyzed by age group, no differences were significant. The ATTEN variables cannot be analyzed by age because they are already specific to a particular age. Results for these three variables are presented in table C-4. Results for the other assessment-by-age variables are presented in table C-5.

The  $t$  test results presented here, based on the amalgamated-main comparison, do not indicate any systematic bias in the main sample estimates. Even for the case of the WJLWSCORE (Letter-Word) variable where the overall age comparison yielded a statistically significant result, no significant difference was detected for the comparisons performed within age groups. This provides strong evidence that the main sample is unbiased for the great majority of the assessment variables considered in this study.

### ***Comparisons Between the Unweighted Main and Nonresponse Samples***

In the comparison of unweighted means from the main and nonresponse samples, one—WJAPSCORE—of the eight across-age comparisons revealed a significant difference. Among the 8 across-age comparisons and the 18 by-age comparisons, 3 of the by-age results yielded a significant difference—ATTEN 4 years old, WJLWSCORE 4 years old, and WJAPSCORE 4 years old. These results are provided in detail in tables C-6 and C-7.

While these results in isolation might raise some concerns about possible bias, particularly in cohort B (age 4), it is important to remember that the analyses were unweighted, and weighting is designed to reflect the sampling probability as well as reduce bias due to nonresponse.

### ***Grouped Overall Comparisons***

Looking at the results from the view point of overall comparisons, even stronger statements can be made about such comparisons than about individual comparisons. Chi-square tests were performed to compare the overall distributions of age and disability. For the age distribution, the difference between the amalgamated and main samples is not significant at a  $p$ -value of 79 percent. Similarly, the difference in the disability distribution in the two samples is not significant with a  $p$ -value of 69 percent.

The Benjamini-Hochberg procedure was used to perform multiple comparisons for tables C-4 through C-7. If this procedure is applied to the result given in table C-4 with an overall significance level of 5 percent, it can be said that the differences in the 11 pairs of means are collectively not significant. The same can be said for the result presented in table C-5 even more forcefully because none of the tests have a  $p$ -value less than 5 percent. Furthermore, the Benjamini-Hochberg procedure enables us to claim that unweighted comparisons shown in tables C-6 and C-7 are not significantly different either in terms of overall comparison.

### ***Logistic Regression Results***

Logistic regression analysis was used to examine whether participation status depends on the assessment scores. Dependency indicates possible bias in the score variables. Since the participation status variable is dichotomous, such dependency using logistic regression can be examined, where participation status was used as the dependent variable and assessment scores, disability category, and age as independent variables. By adding age and disability category in the regression models, the dependency is studied by subgroups of age and disability category.

Researchers tried to put as many score variables as possible together in a single model. However, since many score variables are age dependent, the age groups permissible in each model had to be limited. Furthermore, for some scores (e.g., IGDI Alliteration and Rhyming scores), although the tests shared a common age group, the regression coefficients could not be estimated when the tests were placed in a single model. This occurred because the score variables are defined not only based on age but also based on other differing restrictions and this, in turn, created many cases with missing values on one of the score variables. Separate models were developed for those variables. In every model, assessment scores were not significant predictors of participation status (see tables C-8-A through 8-H).

## **Conclusions**

Based on the three sets of analyses presented here, it can be concluded that there is little evidence of response bias in the PEELS main sample data. While a few individual comparisons of unweighted data were significantly different, the comparisons of the weighted data were not, in particular when run by age. Furthermore, even those significantly different individual comparisons were not significant as a collective group. This suggests that the weights have eliminated bias in the unweighted main sample. In addition, none of the regressions indicated that assessment scores were significant predictors of participation status. Based on this evidence, no systematic differences exist between the main and nonresponse bias study samples.

**Table C-3. Main and amalgamated sample comparison of sex, age, and disability categories**

Variable Name	Main		Amalgamated		Difference on main and amalgamated sample set					
	<i>N</i>	est	<i>N</i>	est	est	<i>s.e.</i>	Lower C.L.	Upper C.L.	<i>t</i> test <i>p</i> -value	Significant?
SEX_1	2,242	0.698	2,426	0.715	-0.018	0.017	-0.052	0.017	0.312	No
SEX_2	2,242	0.302	2,426	0.285	0.018	0.017	-0.017	0.052	0.312	No
AGE_3	2,242	0.182	2,426	0.194	-0.012	0.008	-0.027	0.003	0.127	No
AGE_4	2,242	0.368	2,426	0.358	0.010	0.013	-0.017	0.036	0.471	No
AGE_5	2,242	0.418	2,426	0.421	-0.003	0.013	-0.028	0.023	0.846	No
DDCAT_1	2,242	0.345	2,426	0.331	0.014	0.032	-0.050	0.077	0.666	No
DDCAT_2	2,242	0.505	2,426	0.491	0.014	0.028	-0.042	0.070	0.622	No
DDCAT_3	2,242	0.030	2,426	0.026	0.004	0.009	-0.014	0.021	0.690	No
DDCAT_4	2,242	0.035	2,426	0.051	-0.016	0.013	-0.042	0.010	0.229	No
DDCAT_5	2,242	0.046	2,426	0.059	-0.012	0.015	-0.043	0.018	0.426	No
DDCAT_6	2,242	0.006	2,426	0.006	0.001	0.003	-0.005	0.006	0.873	No
DDCAT_7	2,242	0.033	2,426	0.037	-0.004	0.010	-0.023	0.016	0.704	No

**Table C-4. Main and amalgamated sample comparison of the means of child assessment scores**

Variable Name	Main		Amalgamated		Difference on main and amalgamated sample set					
	<i>N</i>	est	<i>N</i>	est	est	<i>s.e.</i>	Lower C.L.	Upper C.L.	<i>t</i> test <i>p</i> -value	Significant?
<b>WJQCCScore</b>	807	7.37	863	7.30	0.06	0.28	-0.49	0.62	0.822	No
<b>WJQCNSScore</b>	807	3.55	863	3.16	0.40	0.22	-0.03	0.82	0.067	No
<b>WJAPScore</b>	2,242	10.38	2,426	10.10	0.29	0.24	-0.18	0.76	0.225	No
<b>WJLWScore</b>	2,239	7.93	2,423	7.50	0.43	0.20	0.04	0.82	0.032	Yes
<b>IGDIPNScore</b>	2,014	14.70	2,178	15.04	-0.34	0.32	-0.98	0.30	0.296	No
<b>IGDIAScore</b>	720	4.96	775	5.07	-0.11	0.34	-0.77	0.56	0.751	No
<b>IGDIRScore</b>	774	6.55	823	6.67	-0.12	0.49	-1.08	0.84	0.812	No
<b>IGDISBScore</b>	1,562	10.17	1,681	10.69	-0.52	0.52	-1.56	0.51	0.317	No
<b>ATTEN3</b>	533	9.15	586	8.96	0.18	0.31	-0.44	0.81	0.557	No
<b>ATTEN4</b>	859	9.07	930	8.70	0.37	0.25	-0.12	0.86	0.139	No
<b>ATTEN5</b>	776	9.30	826	9.59	-0.29	0.38	-1.05	0.47	0.445	No

**Table C-5. Main and amalgamated sample comparison of the means of child assessment scores, by age group**

Variable Name	Age group (in years)	Main		Amalgamated		Difference on main and amalgamated sample set					
		<i>N</i>	est	<i>N</i>	est	est	<i>s.e.</i>	Lower C.L.	Upper C.L.	<i>t</i> test <i>p</i> -value	Significant?
<b>WJAPScore</b>	Age 3	587	5.19	641	5.17	0.01	0.43	-0.83	0.86	0.973	No
	Age 4	848	9.11	922	8.68	0.43	0.41	-0.39	1.24	0.302	No
	Age 5	749	13.28	801	13.19	0.09	0.43	-0.75	0.94	0.825	No
<b>WJLWScore</b>	Age 3	586	4.10	640	4.24	-0.14	0.45	-1.03	0.75	0.756	No
	Age 4	846	5.98	920	5.56	0.42	0.27	-0.12	0.97	0.124	No
	Age 5	749	10.84	801	10.22	0.62	0.42	-0.21	1.45	0.142	No
<b>IGDIPNScore</b>	Age 3	477	10.95	519	11.56	-0.61	0.46	-1.51	0.29	0.183	No
	Age 4	773	13.81	842	13.41	0.40	0.51	-0.60	1.41	0.429	No
	Age 5	711	16.50	760	17.45	-0.94	0.59	-2.10	0.22	0.110	No
<b>IGDIAScore</b>	Age 4	254	3.48	279	3.26	0.22	0.32	-0.40	0.85	0.486	No
	Age 5	426	5.48	454	5.93	-0.45	0.62	-1.66	0.77	0.470	No
<b>IGDIRScore</b>	Age 4	302	5.11	320	4.97	0.14	0.27	-0.38	0.67	0.596	No
	Age 5	431	7.02	459	7.31	-0.30	0.73	-1.73	1.14	0.683	No
<b>IGDISBScore</b>	Age 4	785	7.30	852	7.60	-0.30	0.54	-1.37	0.77	0.579	No
	Age 5	719	12.06	768	12.61	-0.55	0.90	-2.32	1.23	0.545	No

**Table C-6. Main and nonresponse sample comparison of the unweighted means of child assessment scores**

Variable Name	Main		Nonresponse		Difference on main and amalgamated sample set					
	<i>N</i>	<i>est</i>	<i>N</i>	<i>est</i>	<i>est</i>	<i>s.e.</i>	Lower C.L.	Upper C.L.	<i>t</i> test <i>p</i> -value	Significant?
M_WJQCCScore	807	7.24	56	7.16	0.08	0.450	-0.80	0.96	0.843	No
M_WJQCNSScore	807	3.34	56	2.91	0.43	0.413	-0.38	1.24	0.293	No
M_WJAPScore	2,242	9.68	184	8.50	1.18	0.457	0.29	2.08	0.010	Yes
M_WJLWScore	2,239	7.10	184	6.29	0.81	0.441	-0.06	1.67	0.064	No
M_IGDIPNScore	2,014	14.50	164	14.61	-0.11	0.509	-1.11	0.89	0.836	No
M_IGDIAScore	720	4.89	55	4.60	0.29	0.559	-0.81	1.39	0.556	No
M_IGDIRScore	774	6.42	49	6.35	0.07	0.680	-1.26	1.40	0.919	No
M_IGDISBScore	1,562	9.91	119	9.90	0.01	0.830	-1.62	1.64	0.989	No

**Table C-7. Main and nonresponse sample comparison of the unweighted means of child assessment scores, by age**

Variable Name	Age group (in years)	Main		Nonresponse		Difference on main and amalgamated sample set					
		<i>N</i>	est	<i>N</i>	est	est	<i>s.e.</i>	Lower C.L.	Upper C.L.	<i>t</i> test <i>p</i> -value	Significant?
<b>M_WJAPScore</b>	Age 3	587	5.16	54	5.17	-0.01	0.615	-1.21	1.20	0.992	No
	Age 4	848	9.31	74	7.65	1.66	0.610	0.47	2.86	0.009	Yes
	Age 5	749	13.14	52	12.83	0.31	0.780	-1.22	1.84	0.698	No
<b>M-WJLWScore</b>	Age 3	586	4.03	54	4.04	-0.01	0.539	-1.06	1.05	0.994	No
	Age 4	846	5.99	74	4.96	1.03	0.542	-0.04	2.09	0.035	Yes
	Age 5	749	10.20	52	10.12	0.08	0.900	-1.68	1.86	0.928	No
<b>M_IGDIPNScore</b>	Age 3	477	10.93	42	11.71	-0.78	0.869	-2.49	0.92	0.324	No
	Age 4	773	14.24	69	13.42	0.82	0.733	-0.62	2.26	0.282	No
	Age 5	711	16.82	49	18.43	-1.61	0.888	-3.35	0.14	0.069	No
<b>M_IGDIAScore</b>	Age 4	254	3.70	25	3.20	0.50	0.621	-0.72	1.72	0.289	No
	Age 5	426	5.41	28	5.75	-0.34	0.847	-2.00	1.32	0.676	No
<b>M_IGDIRScore</b>	Age 4	302	5.13	18	4.67	0.46	0.963	-1.43	2.36	0.587	No
	Age 5	431	7.05	28	7.43	-0.38	0.924	-2.19	1.44	0.706	No
<b>M_IGDISBScore</b>	Age 4	785	7.43	67	7.28	0.15	0.887	-1.59	1.89	0.850	No
	Age 5	719	12.06	49	12.78	-0.72	1.388	-3.44	2.01	0.617	No
<b>M_ATTEN</b>	Age 3	533	9.18	53	8.58	0.59	0.463	-0.32	1.50	0.283	No
	Age 4	859	9.26	71	8.21	1.05	0.439	0.19	1.91	0.009	Yes
	Age 5	776	9.50	53	9.40	0.10	0.561	-1.00	1.20	0.868	No

**Table C-8-A. Logistic regression results for model of Woodcock-Johnson III: Quantitative Concepts scores**

Hypothesis Testing Results: 863 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F	Note
Overall fit	0.413	8	114	0.911	
Woodcock-Johnson: Quant. Concepts – Concepts score	1.914	1	121	0.169	
Woodcock-Johnson: Quant. Concepts – Number Series score	2.436	1	121	0.121	
ddiscat2[7]	0.186	6	116	0.98	

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T	Comment
Intercept	0.3	1.279	0.237	0.813	
Woodcock-Johnson: Quant. Concepts – Concepts score	-0.11	0.078	-1.384	0.169	
Woodcock-Johnson: Quant. Concepts – Number Series score	0.13	0.082	1.561	0.121	
ddiscat2.1	-0.13	0.804	-0.158	0.874	
ddiscat2.2	0.06	0.922	0.06	0.952	
ddiscat2.3	0.55	34.731	0.016	0.987	Unstable Standard error
ddiscat2.4	-0.5	1.351	-0.372	0.711	
ddiscat2.5	0.32	2.068	0.156	0.877	
ddiscat2.6	0.32	32.915	0.01	0.992	Unstable Standard error

Note: ddiscat2.1 = Deafness, hearing impairment, and speech or language impairment; ddiscat2.2 = Development delay; ddiscat2.3 = Autism; ddiscat2.4 = Emotional disturbance/behavior disorder, learning disability, mild mental retardation, and traumatic brain injury; ddiscat2.5 = Orthopedic impairment, other health impairment, visual impairment/blindness, and other; ddiscat2.6 = Deaf/blindness, moderate/severe mental retardation, and multiple disabilities; disability categories were combined to increase cell sizes.

**Table C-8-B. Logistic regression results for model of Woodcock Johnson III Letter-Word and Applied Problems and IGDI Picture Naming scores**

Hypothesis Testing Results: 2178 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F
Overall fit	2.1327	11	111	0.0234
ddiscat2[7]	0.5529	6	116	0.7669
Woodcock-Johnson: Letter-Word score	2.6736	1	121	0.1046
Woodcock-Johnson: Applied Problems score	0.5406	1	121	0.4636
IGDI Picture Naming score	1.4604	1	121	0.2292
CHLDAGE2[3]	0.5636	2	120	0.5707

Estimated Full Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T
Intercept	-0.18	1.1105	-0.1638	0.8702
ddiscat2.1	0.16	0.6333	0.2587	0.7963
ddiscat2.2	0.29	0.6419	0.4593	0.6469
ddiscat2.3	-0.13	1.2519	-0.1015	0.9193
ddiscat2.4	-0.73	1.1091	-0.6582	0.5117
ddiscat2.5	-0.27	1	-0.2701	0.7875
ddiscat2.6	0.81	32.9739	0.0245	0.9805
Woodcock-Johnson: Letter-Word score	0.03	0.0208	1.6351	0.1046
Woodcock-Johnson: Applied Problems score	0.03	0.0361	0.7353	0.4636
IGDI Picture Naming score	-0.05	0.0384	-1.2085	0.2292
CHLDAGE2.1	0.14	0.7784	0.1809	0.8568
CHLDAGE2.2	0.35	0.5473	0.635	0.5266

Note: ddiscat2.1 = Deafness, hearing impairment, and speech or language impairment; ddiscat2.2 = Development delay; ddiscat2.3 = Autism; ddiscat2.4 = Emotional disturbance/behavior disorder, learning disability, mild mental retardation, and traumatic brain injury; ddiscat2.5 = Orthopedic impairment, other health impairment, visual impairment/blindness, and other; ddiscat2.6 = Deaf/blindness, moderate/severe mental retardation, and multiple disabilities; disability categories were combined to increase cell sizes. CHLDAGE2.1 = 3 years of age; CHLDAGE2.2 = 4 years of age

**Table C-8-C. Logistic regression results for model of IGDI Alliteration scores**

Hypothesis Testing Results: 775 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F
Overall fit	0.043	5	117	0.999
ddiscat3[4]	0.013	3	119	0.998
CHLDAGE2[2]	0.045	1	121	0.832
IGDI Alliteration score	0.216	1	121	0.643

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T
Intercept	0.25	1.955	0.126	0.9
ddiscat3.1	-0.17	1.831	-0.095	0.924
ddiscat3.2	-0.1	1.901	-0.054	0.957
ddiscat3.3	-0.14	2.352	-0.058	0.954
CHLDAGE2.1	-0.14	0.64	-0.213	0.832
IGDI Alliteration score	-0.03	0.07	-0.465	0.643

Note: ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes. CHLDAGE2.1 = 4 years of age

**Table C-8-D. Logistic regression results for model of IGDI Rhyming scores**

Hypothesis Testing Results: 823 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F	Note
Overall fit	0.304	5	117	0.91	
ddiscat3[4]	0.201	3	119	0.896	
CHLDAGE2[2]	0.157	1	121	0.693	
IGDI Rhyming score	0.195	1	121	0.66	

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T	Comment
Intercept	0.59	1.47	0.399	0.691	
ddiscat3.1	-0.11	1.728	-0.066	0.948	
ddiscat3.2	-0.5	1.538	-0.325	0.746	
ddiscat3.3	-0.55	34.21	-0.016	0.987	Unstable Standard Error
CHLDAGE2.1	0.28	0.697	0.396	0.693	
IGDI Rhyming score	-0.03	0.067	-0.442	0.66	

Note: ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes. CHLDAGE2.1 = 4 years of age

**Table C-8-E. Logistic regression results for model of IGDI Segment Blending scores**

Hypothesis Testing Results: 1681 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F
Overall fit	0.639	5	117	0.67
CHLDAGE2[2]	0.076	1	121	0.783
ddiscat3[4]	0.229	3	119	0.876
IGDI Segment Blending score	0.441	1	121	0.508

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T
Intercept	-0.25	0.794	-0.315	0.753
CHLDAGE2.1	0.15	0.555	0.276	0.783
ddiscat3.1	0.28	0.873	0.32	0.749
ddiscat3.2	0.41	0.771	0.538	0.591
ddiscat3.3	1.28	1.716	0.746	0.457
IGDI Segment Blending score	-0.01	0.022	-0.664	0.508

Note: ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes. CHLDAGE2.1 = 4 years of age

**Table C-8-F. Logistic regression results for model of Leiter-R Attention Sustained scores, 3 years old**

Hypothesis Testing Results: 586 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F
Overall fit	0.631	4	118	0.641
ddiscat3[4]	0.515	3	119	0.672
Leiter-R Attention Sustained score, age 3	0.618	1	121	0.433

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T
Intercept	-1.58	1.727	-0.915	0.362
ddiscat3.1	0.66	1.35	0.486	0.628
ddiscat3.2	1.19	1.513	0.785	0.434
ddiscat3.3	-0.37	2.354	-0.156	0.876
Leiter-R Attention Sustained score, age 3	0.06	0.073	0.786	0.433

Note ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes.

**Table C-8-G. Logistic regression results for model of Leiter-R Attention Sustained scores, 4 years old**

Hypothesis Testing Results: 929 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F
Overall fit	1.005	4	118	0.408
ddiscat3[4]	0.426	3	119	0.734
Leiter-R Attention Sustained score, age 4	3.082	1	121	0.082

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T
Intercept	-1.59	1.6	-0.991	0.324
ddiscat3.1	0.67	1.476	0.452	0.652
ddiscat3.2	1.1	1.477	0.746	0.457
ddiscat3.3	1.64	1.828	0.898	0.371
Leiter-R Attention Sustained score, age 4	0.1	0.059	1.756	0.082

Note ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes.

**Table C-8-H. Logistic regression results for model of Leiter-R Attention Sustained scores, 5 years old**

Hypothesis Testing Results: 829 (Unweighted)

Test	F-Value	Num. DF	Denom. DF	Prob>F	Note
Overall fit	0.139	4	118	0.967	
ddiscat3[4]	0.032	3	119	0.992	
Leiter-R Attention Sustained score, age 5	0.459	1	121	0.5	

Estimated Full Sample Regression Coefficients

Parameter	Parameter estimate	Standard error of estimate	Test for H0: Parameter=0	Prob> T	Comment
Intercept	0.19	1.104	0.176	0.861	
ddiscat3.1	0.16	0.971	0.169	0.866	
ddiscat3.2	0.27	1.022	0.261	0.795	
ddiscat3.3	0.57	34.718	0.016	0.987	Unstable Standard Error
Leiter-R Attention Sustained score, age 5	-0.04	0.065	-0.677	0.5	

Note: ddiscat3.1 = Deafness, hearing impairment, orthopedic impairment, other health impairment, speech or language impairment, visual impairment/blindness, and other; ddiscat3.2 = Development delay; ddiscat3.3 = Autism; disability categories were combined to increase cell sizes.

## Appendix D: Standard Error Tables

*EDITOR'S NOTE:* The tables in appendix B contain standard errors for the corresponding tables in the main body of the report. For example, table D-5 contains the standard errors for table 5.

**Table D-12. Standard error for the percentage of young children who received preschool special education services during the 2003-04 school year who received additional services and stopped services in 2004-05, by transition between 2003-04 and 2004-05**

	Total	Transition status		
		Made no grade transition	Transitioned from preschool to kindergarten	Transitioned from kindergarten to first grade
Received service in 2003-04				
Speech therapy	1.2	1.3	2.2	2.4
Occupational therapy	1.9	2.3	2.6	5.7
Physical therapy	2.0	2.1	2.8	4.9
Special instruction	2.8	2.6	4.3	5.9
Tutoring	1.8	2.4	2.4	2.4
Other	0.6	1.0	1.1	2.0
Received additional service in 2004-05				
Speech therapy	0.3	0.5	0.9	0.4
Occupational therapy	1.2	1.3	1.8	3.3
Physical therapy	0.7	1.1	0.9	1.4
Special instruction	1.3	1.5	2.1	4.7
Tutoring	1.1	1.0	2.1	5.9
Other	1.3	1.2	2.5	‡
Stopped service in 2004-2005				
Speech therapy	0.7	0.9	1.2	2.3
Occupational therapy	1.1	1.2	1.8	5.0
Physical therapy	1.3	2.1	1.6	4.9
Special instruction	1.5	2.0	2.8	2.6
Tutoring	1.5	1.3	2.9	3.0
Other	0.6	1.2	1.1	‡

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Elementary School Teacher Questionnaire," "Kindergarten Teacher Questionnaire," "Early Childhood Teacher Questionnaire," and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-13. Standard error for the percentage of young children who received preschool special education services during the 2004-05 school year who received additional services and stopped services in 2005-06, by transition between 2004-05 and 2005-06**

	Transition status			
	<b>Total</b>	Made no grade transition	Transitioned from preschool to kindergarten	Transitioned from kindergarten to first grade
Received service in 2004-05				
Speech therapy	1.0	2.1	1.7	1.8
Occupational therapy	1.7	3.5	2.5	2.3
Physical therapy	1.5	3.4	2.3	2.8
Special instruction	1.6	2.8	2.9	3.3
Tutoring	1.7	3.5	2.2	2.5
Other	0.8	1.3	1.2	1.9
Received additional service in 2005-06				
Speech therapy	0.3	0.6	0.5	0.3
Occupational therapy	0.9	2.6	1.2	2.2
Physical therapy	0.8	1.7	1.9	1.0
Special instruction	1.2	1.8	2.2	2.5
Tutoring	1.5	3.2	2.3	2.5
Other	0.7	1.5	0.6	1.0
Stopped service in 2005-2006				
Speech therapy	0.8	1.1	1.4	1.2
Occupational therapy	0.7	2.0	1.4	1.1
Physical therapy	0.8	1.6	1.1	1.4
Special instruction	0.9	1.7	1.6	1.2
Tutoring	1.7	3.3	2.2	2.6
Other	0.9	0.6	1.6	1.9

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Elementary School Teacher Questionnaire," "Kindergarten Teacher Questionnaire," "Early Childhood Teacher Questionnaire," and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-14. Standard errors for the percentage of young children who received preschool special education services with different types of transitions and were declassified in the subsequent year**

	Type of transition			Transitioned from kindergarten to first grade
	<b>Total</b>	Made no grade transition	Transitioned from preschool to kindergarten	
Percentage of children in each transition group who were declassified between 2003-04 and 2004-05	1.3	1.0	2.3	5.8
Percentage of children in each transition group who were declassified between 2004-05 and 2005-06	1.2	1.8	2.2	2.5

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

**Table D-15. Standard errors for the percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by demographic characteristics**

	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>	1.1	1.1
Child gender		
Male	1.5	1.5
Female	2.3	2.3
Race/ethnicity		
Black	3.0	3.0
Hispanic	2.7	2.7
White	1.1	1.1
Disability category		
Autism	4.9	4.9
Developmental delay	1.9	1.9
Emotional disturbance	9.8	9.8
Learning disability	8.2	8.2
Mental retardation	6.0	6.0
Orthopedic impairment	‡	‡
Other health impairment	4.8	4.8
Speech or language impairment	1.8	1.8
Low incidence	7.2	7.2
Family income		
\$20,000 or less	2.5	2.5
\$20,001 to \$40,000	2.5	2.5
More than \$40,000	1.8	1.8

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Table D-16. Standard errors for the percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by demographic characteristics**

	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>	1.1	1.1
Child gender		
Male	1.4	1.4
Female	1.8	1.8
Race/ethnicity		
Black	5.9	5.9
Hispanic	2.3	2.3
White	1.1	1.1
Disability category		
Autism	6.2	6.2
Developmental delay	2.5	2.5
Emotional disturbance	11.7	11.7
Learning disability	‡	‡
Mental retardation	4.5	4.5
Orthopedic impairment	‡	‡
Other health impairment	8.7	8.7
Speech or language impairment	2.2	2.2
Low incidence	11.2	11.2
Family income		
\$20,000 or less	2.4	2.4
\$20,001 to \$40,000	3.0	3.0
More than \$40,000	1.6	1.6

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), “Kindergarten Teacher Questionnaire” and “Parent interview,” previously unpublished tabulation (February 2007).

**Table D-17. Standard errors for the percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by child characteristics**

	Ease of transition: Parent report	
	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>	1.1	1.1
Teacher ratings of child's academic skills		
Below or far below average	2.2	2.2
Average	1.7	1.7
Above or far above average	2.2	2.2
Teacher ratings of number of friends compared to classmates		
Fewer or far fewer than most	2.5	2.5
As many as most	2.0	2.0
More or far more than most	3.5	3.5

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-18. Standard errors for the percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by child characteristics**

	Ease of transition: Teacher report	
	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>	1.1	1.1
Teacher ratings of child's academic skills		
Below or far below average	2.2	2.2
Average	2.1	2.1
Above or far above average	1.8	1.8
Teacher ratings of number of friends compared to classmates		
Fewer or far fewer than most	3.4	3.4
As many as most	1.0	1.0
More or far more than most	2.7	2.7

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-19. Standard errors for the percentage of young children who received preschool special education services and parent report of the ease of transition to kindergarten, by involvement and support**

	Somewhat easy or very easy	Somewhat hard or very hard
<b>Total</b>		
Family initiation of action to support transition		
Family initiated action to support transition	1.4	1.4
Family did not initiate action to support transition	3.0	3.0
School initiation of action to support transition		
School initiated action to support transition	1.3	1.3
School did not initiate action to support transition	2.3	2.3
Teacher involvement in planning		
Teacher not at all involved in planning	1.8	1.8
Teacher somewhat involved in planning	2.2	2.2
Teacher extensively involved in planning	4.7	4.7
Adequacy of teacher support		
Teacher support was very adequate or no support needed	2.0	2.0
Teacher support was somewhat adequate	2.3	2.3
Teacher support was not very or not at all adequate	7.3	7.3
Adequacy of support provided to child		
Very adequate support provided to child or no support needed	2.0	2.0
Somewhat adequate support provided to child	3.4	3.4
Not very or not at all adequate support provided to child	7.7	7.7

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-20. Standard errors for the percentage of young children who received preschool special education services and teacher report of the ease of transition to kindergarten, by involvement and support**

	Somewhat easy or very easy	Somewhat difficult or very difficult
<b>Total</b>		
Family initiation of action to support transition		
Family initiated action to support transition	1.1	1.1
Family did not initiate action to support transition	3.0	3.0
School initiation of action to support transition		
School initiated action to support transition	1.1	1.1
School did not initiate action to support transition	3.0	3.0
Teacher involvement in planning		
Teacher not at all involved in planning	1.9	1.9
Teacher somewhat involved in planning	2.1	2.1
Teacher extensively involved in planning	3.4	3.4
Adequacy of teacher support		
Teacher support was very adequate or no support needed	1.6	1.6
Teacher support was somewhat adequate	2.4	2.4
Teacher support was not very or not at all adequate	8.5	8.5
Adequacy of support provided to child		
Very adequate support provided to child or no support needed	1.6	1.6
Somewhat adequate support provided to child	2.4	2.4
Not very or not at all adequate support provided to child	11.9	11.9

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire" and "Parent interview," previously unpublished tabulation (February 2007).

**Table D-21. Standard errors for the percentage of young children who received preschool special education services whose kindergarten teachers used various strategies to help them transition into kindergarten, by characteristics of the setting and respondent**

Characteristics of the setting and respondent					
	<b>Total</b>	Preschool class in same school	Some other program or at home	Regular education teacher	Special education teacher
Received children's previous records	1.2	1.4	1.6	1.3	1.6
Parents/guardians encouraged to meet new staff.	1.8	2.5	2.3	2.1	3.5
Sending programs provided information about children	1.3	1.6	1.6	1.7	1.4
Children's families visited the classroom or school.	2.2	2.6	2.6	2.2	4.0
Provided parents with written information	2.1	3.3	2.6	1.9	5.8
Participated in children's IEP development	2.6	3.2	3.5	2.9	4.9
Met with staff of sending programs	2.5	4.4	2.3	2.3	4.6
Called the children's parents	2.9	3.8	2.9	3.4	4.7
Developed child-specific preparatory strategies	1.8	3.7	2.2	2.4	4.5
Visited children's previous settings	3.2	3.5	3.0	2.7	5.1
Visited children's home	2.7	5.4	2.3	2.6	6.6

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

**Table D-22. Standard errors for the percentage of young children who received preschool special education services and the number of supports used by their kindergarten teachers during the transition to kindergarten, by district factors**

	0 or 1 support	2 or 3 supports	4 or 5 supports	6 or more supports
<b>Total</b>	1.0	1.8	1.4	2.2
District size				
Very large	2.5	4.4	2.5	3.7
Large	2.7	2.0	4.7	6.7
Medium	0.9	4.9	1.8	4.8
Small	1.4	2.4	2.0	3.1
Metropolitan status				
Urban	2.1	2.9	2.2	3.4
Suburban	1.3	2.7	1.6	2.9
Rural	1.3	3.7	3.2	4.1
District wealth				
High	1.1	3.7	2.4	3.6
Medium	0.7	2.5	2.0	2.0
Low	2.5	3.7	3.8	5.8
Very low	3.1	4.2	3.2	4.1

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

**Table D-23. Standard errors for teacher ratings of young children who received preschool special education services on the Social Skills Scale of the Social Skills Rating System, by disability and gender: School year 2005-06**

Total		AU		DD		ED		LD		MR		OI		OHI		SLI		LI	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0.5	1.0	2.0	4.7	1.2	1.7	2.2	1.6	2.0	2.9	1.8	3.3	4.0	2.9	1.5	3.4	0.8	1.3	3.0	8.4

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Social Skills Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

**Table D-24. Standard errors for teacher ratings of young children who received preschool special education services on the Problem Behaviors Scale of the Social Skills Rating System, by disability and gender: School year 2005-06**

Total		AU		DD		ED		LD		MR		OI		OHI		SLI		LI	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0.4	0.6	0.8	2.1	1.0	2.7	1.8	2.1	1.8	3.8	1.3	2.7	2.4	3.9	1.1	2.5	0.9	1.6	2.1	5.6

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Social Skills Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

**Table D-25. Standard errors for the percentage of young children who received preschool special education services who have trouble playing with other children, by age cohort and school year: School years 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
No trouble	1.5	1.6
Some trouble	1.6	1.5
A lot of trouble	0.6	0.9
<b>Cohort A</b>		
No trouble	1.8	1.7
Some trouble	1.7	1.8
A lot of trouble	0.9	1.2
<b>Cohort B</b>		
No trouble	2.0	2.1
Some trouble	2.0	1.8
A lot of trouble	1.2	1.1
<b>Cohort C</b>		
No trouble	2.6	3.2
Some trouble	2.8	2.9
A lot of trouble	1.3	1.6

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-26. Standard errors for the percentage of young children who received preschool special education services who were easily involved in everyday things that went on at home, by age cohort and school year: School years 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
Very easily involved	1.3	1.3
Somewhat involved	1.2	1.0
Not easily involved	0.7	0.9
<b>Cohort A</b>		
Very easily involved	1.9	1.9
Somewhat involved	1.9	2.0
Not easily involved	1.1	1.0
<b>Cohort B</b>		
Very easily involved	1.7	1.8
Somewhat involved	2.1	2.1
Not easily involved	1.4	1.4
<b>Cohort C</b>		
Very easily involved	2.3	2.3
Somewhat involved	2.2	1.8
Not easily involved	1.3	1.7

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-27. Standard errors for the percentage of young children who received preschool special education services who were not at all, sometimes, or often aggressive with other children, by age cohort and school year: School year 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
Not at all aggressive	1.2	1.5
Sometimes aggressive	1.2	1.5
Often aggressive	0.6	0.6
<b>Cohort A</b>		
Not at all aggressive	1.8	1.7
Sometimes aggressive	2.1	1.9
Often aggressive	1.1	1.2
<b>Cohort B</b>		
Not at all aggressive	1.6	1.9
Sometimes aggressive	1.5	1.9
Often aggressive	0.8	1.1
<b>Cohort C</b>		
Not at all aggressive	2.3	2.5
Sometimes aggressive	2.4	2.6
Often aggressive	0.9	0.9

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-28. Standard errors for the percentage of young children who received preschool special education services who were good at paying attention and staying focused on what they were doing, by age cohort and school year: School years 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
Very good at paying attention	2.0	1.2
Somewhat good at paying attention	2.2	1.5
Not at all good at paying attention	1.3	1.5
<b>Cohort A</b>		
Very good at paying attention	1.6	1.4
Somewhat good at paying attention	2.1	2.1
Not at all good at paying attention	1.5	2.1
<b>Cohort B</b>		
Very good at paying attention	2.2	2.0
Somewhat good at paying attention	2.4	2.5
Not at all good at paying attention	2.0	1.8
<b>Cohort C</b>		
Very good at paying attention	3.0	2.5
Somewhat good at paying attention	3.7	2.3
Not at all good at paying attention	2.1	2.6

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-29. Standard errors for the percentage of young children who received preschool special education services who were restless, fidgeted a lot, and had trouble sitting still, by age cohort and school year: School years 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
Very restless	1.5	1.4
Somewhat restless	1.1	1.2
Not at all restless	1.2	1.1
<b>Cohort A</b>		
Very restless	2.1	2.6
Somewhat restless	1.7	2.2
Not at all restless	1.5	1.6
<b>Cohort B</b>		
Very restless	2.1	1.6
Somewhat restless	1.8	1.8
Not at all restless	1.9	2.0
<b>Cohort C</b>		
Very restless	2.1	2.6
Somewhat restless	2.1	2.4
Not at all restless	1.7	2.5

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-30. Standard errors for the percentage of young children who received preschool special education services whose behavior was appropriate for their age, by age cohort and school year: School years 2003-04 and 2005-06**

	2003-04	2005-06
<b>Total</b>		
Age appropriate	1.1	1.7
Mildly inappropriate	1.0	1.6
Moderately inappropriate	0.8	1.0
Severely inappropriate	0.5	0.5
<b>Cohort A</b>		
Age appropriate	2.0	2.6
Mildly inappropriate	1.2	1.6
Moderately inappropriate	1.5	1.5
Severely inappropriate	0.6	1.1
<b>Cohort B</b>		
Age appropriate	1.7	2.0
Mildly inappropriate	1.5	1.7
Moderately inappropriate	1.3	1.5
Severely inappropriate	0.8	0.7
<b>Cohort C</b>		
Age appropriate	2.3	3.2
Mildly inappropriate	1.9	3.4
Moderately inappropriate	1.3	2.0
Severely inappropriate	1.1	0.5

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (November 2006).

**Table D-32. Standard errors for teacher ratings of young children who received preschool special education services on the Social Skills Scale of the Social Skills Rating System, by declassification status and gender: School year 2005-06**

	Male	Female
<b>Total</b>	0.7	1.1
Had an IEP in 2003-04, but declassified after 2003-04	1.9	2.2
Had an IEP in 2003-04 and 2004-05, but declassified after 2004-05	1.0	2.2
Had an IEP in 2003-04, 2004-05, and 2005-06	0.8	1.4

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Social Skills Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

**Table D-33. Standard errors for teacher ratings of young children who received preschool special education services on the Problem Behaviors Scale of the Social Skills Rating System, by declassification status and gender: School year 2005-06**

	Male	Female
<b>Total</b>	0.5	0.9
Had an IEP in 2003-04, but declassified after 2003-04	1.6	1.8
Had an IEP in 2003-04 and 2004-05, but declassified after 2004-05	0.9	3.7
Had an IEP in 2003-04, 2004-05, and 2005-06	0.6	1.3

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Problem Behaviors Scale of the Social Skills Rating System," previously unpublished tabulation (November 2006).

## Appendix E: Standard Error Tables for Figures

**Table E-1. Standard errors for the percentage of young children who received preschool special education services during the 2003-04 school year and the intensity of their transition between 2003-04 and 2004-05 and between 2004-05 and 2005-06**

	Intensity of transition			
	Made no transition in grade or program	Changed program only	Changed grade only	Changed both grade and program
2003-04 to 2004-05	1.6	1.3	1.7	1.6
2004-05 to 2005-06	1.3	1.0	1.8	2.1

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Elementary School Teacher Questionnaire," "Kindergarten Teacher Questionnaire," "Early Childhood Teacher Questionnaire," and "Parent interview," previously unpublished tabulation (February 2007).

**Table E-2. Standard errors for the percentage of young children who received preschool special education services who were in various placements the year before kindergarten, as reported by their kindergarten teacher**

Exact same school and class as now-1	0.8
Same school but different kindergarten classroom-2	1.0
Preschool class in same school-4	2.0
Some other program or at home-5	2.1
Respondent unsure of child's location during previous year-3	1.3

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Kindergarten Teacher Questionnaire," previously unpublished tabulation (February 2007).

## Appendix F: Number of Children Who Had Test Accommodations

**Table F-1. Unweighted number of children who had various test accommodations in the PEELS Wave 3 direct assessment, by gender: School year 2005-06**

	Male	Female
Abacus	‡	‡
Adaptive furniture	10	6
Communication device	6	‡
Enlarged print	3	‡
Familiar person administered test	‡	‡
Familiar person present	38	7
Multiple test sessions	28	10
Person to help child respond	5	‡
Sign language interpreter	‡	‡
Other	16	6

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (May 2006).

**Table F-2. Unweighted number of children who had various test accommodations in the PEELS Wave 3 direct assessment, by race/ethnicity: School year 2005-06**

	Black	Hispanic	White
Abacus	‡	‡	‡
Adaptive furniture	‡	4	11
Communication device	‡	‡	5
Enlarged print	‡	‡	‡
Familiar person administered test	‡	‡	‡
Familiar person present	5	14	25
Multiple test sessions	‡	9	26
Person to help child respond	‡	‡	‡
Sign language interpreter	‡	‡	3
Other	‡	6	11

‡ Reporting standards not met.

NOTE: Some children who had accommodations are not included in this table because their race/ethnicity is not Black, Hispanic or White.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (May 2006).

**Table F-3. Unweighted number of children who had various test accommodations in the PEELS Wave 3 direct assessment, by Wave 1 primary disability: School year 2005-06**

	AU	DD	ED	LD	MR	OI	OHI	SLI	LI
Abacus	‡	‡	‡	‡	‡	‡	‡	‡	‡
Adaptive furniture	‡	4	‡	‡	‡	5	4	‡	‡
Communication device	‡	‡	‡	‡	‡	‡	‡	‡	5
Enlarged print	‡	‡	‡	‡	‡	‡	‡	3	‡
Familiar person administered test	‡	‡	‡	‡	‡	‡	‡	‡	‡
Familiar person present	12	7	‡	‡	3	‡	3	13	5
Multiple test sessions	6	12	‡	‡	‡	‡	‡	15	3
Person to help child respond	‡	3	‡	‡	‡	‡	‡	5	6
Sign language interpreter	‡	‡	‡	‡	‡	‡	‡	‡	3
Other	3	4	‡	‡	‡	‡	‡	5	6

‡ Reporting standards not met.

NOTE: AU = Autism; DD = Developmental delay; ED = Emotional disturbance; LD = Learning disability; MR = Mental retardation; OI = Orthopedic impairment; OHI = Other health impairment; SLI = Speech or language impairment; LI = Low incidence. Some children who had accommodations are not included in this table because they did not have a disability at the time the teacher questionnaire was administered; the teacher questionnaire was the source of the disability variable.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," "Early Childhood Teacher Questionnaire," and "Kindergarten Teacher Questionnaire," previously unpublished tabulation (May 2006).

**Table F-4. Unweighted number of children who had various test accommodations in the PEELS Wave 3 direct assessment, by age cohort: School year 2005-06**

	Cohort A (3 years old)	Cohort B (4 years old)	Cohort C (5 years old)
Abacus	‡	‡	‡
Adaptive furniture	11	4	‡
Communication device	‡	3	3
Enlarged print	‡	‡	‡
Familiar person administered test	‡	‡	‡
Familiar person present	18	13	14
Multiple test sessions	10	15	13
Person to help child respond	4	‡	‡
Sign language interpreter	‡	‡	‡
Other	8	6	8

‡ Reporting standards not met.

SOURCE: U.S. Department of Education, National Center for Special Education Research, Pre-Elementary Education Longitudinal Study (PEELS), "Parent interview," previously unpublished tabulation (May 2006).

## Appendix G: Analysis Variables Used Throughout Report

Variable	Source	Response codes
<b>CHILD BACKGROUND AND FAMILY CHARACTERISTICS</b>		
Age cohort	LEA sampling frame and parent interview	1=Cohort A 2=Cohort B 3=Cohort C
Child's gender	Parent interview	1=Male 2=Female
Race/ethnicity	Parent interview	1=Hispanic and of any race 2=Black or African American only, not Hispanic 3=White only and not Hispanic
Household income	Parent interview	1=\$20,000 or less 2=\$20,001-\$40,000 3=More than \$40,000
Disability category	Teacher questionnaire	1=Autism 2=Developmental delay 3=Emotional disturbance 4=Learning disability 5=Mental retardation 6=Orthopedic impairment 7=Other health impairment 8=Speech or language impairment 9=Low incidence
Severity of disability	Parent interview	Continuous variable
Number of children in the household	Parent interview	Continuous variable
Mother's age at child's birth	Parent interview	Continuous variable
<b>SCHOOL/PROGRAM CHARACTERISTICS</b>		
District wealth (Percent of district's children living in poverty)	QED sampling frame	1=High wealth (0-12%) 2=Medium wealth (13-34%) 3=Low wealth (35-40%) 4=Very low wealth (>40%)
District size (Number of schools within the district)	QED sampling frame	1=Very large (391 or more) 2=Large (118-390) 3=Medium (42-117) 4=Small (41 or less)
Metropolitan status	QED sampling frame	1=Urban (large or mid-sized central city) 2=Suburban (urban fringe of a large or mid-sized city, large or small town) 3=Rural (population of less than 2500)
Services received through school: occupational therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No

<b>Variable</b>	<b>Source</b>	<b>Response codes</b>
Services received through school: physical therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Services received through school: special instruction (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Services received through school: speech or language therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Services received through school: tutoring (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received occupational therapy in one school year, but had not received occupational therapy in previous year (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received physical therapy in one school year, but had not received physical therapy in previous year (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received special instruction in one school year, but had not received special instruction in previous year (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received speech or language therapy in one school year, but had not received speech or language therapy in previous year (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received tutoring in one school year, but had not received tutoring in previous year (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received occupational therapy in previous school year, but no longer received occupational therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No

<b>Variable</b>	<b>Source</b>	<b>Response codes</b>
Received physical therapy in previous school year, but no longer received physical therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received special instruction in previous school year, but no longer received special instruction (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received speech or language therapy in previous school year, but no longer received speech or language therapy (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Received tutoring in previous school year, but no longer received tutoring (Wave 1 and Wave 2 versions of the variable)	Parent interview	1=Yes 2=No
Type of teacher	Teacher questionnaire	1=Regular education teacher 2=Special education teacher
Percentage of time child spent in regular education classroom	Teacher questionnaire	Continuous variable
<b>TRANSITIONS</b>		
Ease of transition into kindergarten (parent report)	Parent interview	1=Somewhat easy or very easy transition 2=Somewhat hard or very hard transition
Ease of transition into kindergarten (teacher report)	Teacher questionnaire	1=Somewhat easy or very easy transition 2=Somewhat difficult or very difficult transition
Family initiation of action to help support transition to kindergarten	Parent interview	1=Family initiated action to support transition 2=Family did not initiate action to support transition
School initiation of action to help support transition to kindergarten	Parent interview	1=School initiated action to support transition 2=School did not initiate action to support transition
Teacher involvement in planning child's transition into class	Teacher questionnaire	1=Not at all involved in planning 2=Somewhat involved in planning 3=Extensively involved in planning
Adequacy of support provided to the teacher for the child because of his/her disabilities	Teacher questionnaire	1=Teacher support was very adequate or no support needed 2=Teacher support was somewhat adequate 3=Teacher support was not very or not at all adequate

<b>Variable</b>	<b>Source</b>	<b>Response codes</b>
Adequacy of support provided to the child because of his/her disabilities	Teacher questionnaire	1=Very adequate support provided to child or no support needed 2=Somewhat adequate support provided to child 3=Not very or not at all adequate support provided to child
Location of enrollment the year before kindergarten (2 category)	Teacher questionnaire	1=Preschool class in same school 2=Some other program or at home
Grade transition	Teacher questionnaire	1=No grade transition 2= Transitioned from preschool to kindergarten 3= Transitioned from kindergarten to first grade
Location of enrollment the year before kindergarten (5 category)	Teacher questionnaire	1=Exact same school and class as now 2=Same school but different kindergarten classroom 3=Not sure 4=Preschool class in same school 5=Some other program or at home
Transition status	Teacher questionnaire	1=No transition in grade or program 2=Changed program only 3=Changed grade only 4=Changed both grade and program
Transition strategy: received children's previous records	Teacher questionnaire	1=Yes 2=No
Transition strategy: parents/guardians encouraged to meet new staff	Teacher questionnaire	1=Yes 2=No
Transition strategy: sending programs provided information about children	Teacher questionnaire	1=Yes 2=No
Transition strategy: children's families visited the classroom or school	Teacher questionnaire	1=Yes 2=No
Transition strategy: provided parents with written information about the program	Teacher questionnaire	1=Yes 2=No
Transition strategy: participated in children's IEP development	Teacher questionnaire	1=Yes 2=No
Transition strategy: met with staff of sending programs	Teacher questionnaire	1=Yes 2=No
Transition strategy: called the children's parents	Teacher questionnaire	1=Yes 2=No
Transition strategy: developed child-specific preparatory strategies	Teacher questionnaire	1=Yes 2=No
Transition strategy: visited children's previous settings	Teacher questionnaire	1=Yes 2=No

<b>Variable</b>	<b>Source</b>	<b>Response codes</b>
Transition strategy: visited children's home	Teacher questionnaire	1=Yes 2=No
Number of supports used during the transition to kindergarten	Teacher questionnaire	1=0 to 1 support 2=2 or 3 supports 3=4 or 5 supports 4=6 or more supports
<b>DECLASSIFICATION</b>		
Declassified between Wave 1 and Wave 2 [must have been eligible at Wave 1]	Teacher questionnaire, missing data filled in using parent report	1=Has IEP/IFSP at both time points 2=IEP/IFSP at Wave 1 and declassified at Wave 2
Declassified between Wave 2 and Wave 3 [must have been eligible at Wave 1]	Teacher questionnaire, missing data filled in using parent report	1=Has IEP/IFSP at both time points 2=IEP/IFSP at Wave 2 and declassified at Wave 3
IEP status	Teacher questionnaire	1 = Declassified between 2003-04 and 2004-05 2 = Declassified between 2004-05 and 2005-06 3=Had an IEP in 2003-04, 2004-05, and 2005-06
Does child have an IEP?	Teacher questionnaire	1=Yes, has an IEP/IFSP 2=No IEP/IFSP
<b>ACHIEVEMENT</b>		
PPVT	Child assessment	Continuous variable
Child's academic skills compared to typical children of same grade level	Teacher questionnaire	1=Below or far below average 2= Average 3=Above or far above average
<b>SOCIAL SKILLS AND BEHAVIOR</b>		
Child's number of friends compared to his/her classmates	Teacher questionnaire	1=Fewer or far fewer than most 2=As many as most 3=More or far more than most
PKBS Problem Behavior Scale	Teacher questionnaire	Continuous variable
PKBS Social Skills Scale	Teacher questionnaire	Continuous variable
SSRS Problem Behaviors Scale	Teacher questionnaire	Continuous variable
SSRS Social Skills Scale	Teacher questionnaire	Continuous variable
Children's ability to play with other children	Parent interview	1=No trouble playing with other children 2=Some trouble playing with other children 3=A lot of trouble playing with other children
Extent to which children were easily involved in everyday things that went on at home, like playing with toys, or paying attention to conversations	Parent interview	1=Very easily involved 2=Somewhat involved 3=Not easily involved

<b>Variable</b>	<b>Source</b>	<b>Response codes</b>
How often children were aggressive with other children	Parent interview	1=Not at all aggressive 2=Sometimes aggressive 3=Often aggressive
Extent to which children were good at paying attention to things and staying focused on what they were doing	Parent interview	1=Very good at paying attention 2=Somewhat good at paying attention 3=Not at all good at paying attention
Extent to which children were restless, fidgeted a lot, and had trouble sitting still	Parent interview	1=Very restless 2=Somewhat restless 3=Not at all restless
Appropriateness of children's behavior compared with other children about the same age.	Parent interview	1=Age appropriate 2=Mildly inappropriate 3=Moderately inappropriate 4=Severely inappropriate
Behavior scale	Parent interview	Continuous variable
Social relations at school scale	Parent interview	Continuous variable

## Appendix H: Final Augmented LEA Sample Size

**Table H-1. Final augmented LEA sample size by district size and region**

Region	Size				
	Total	Very large	Large	Medium	Small
<b>Total</b>	232	39	42	51	100
Northeast	66	9	13	14	30
Southeast	56	16	10	16	14
Central	63	3	8	15	37
West/Southwest	47	11	11	6	19

**Table H-2. Final augmented LEA sample size by district size and wealth**

District wealth	Size				
	Total	Very large	Large	Medium	Small
<b>Total</b>	232	39	42	51	100
High	67	4	10	15	38
Medium	67	8	14	14	31
Low	59	12	9	15	23
Very low	39	15	9	7	8

**Table H-3. Final augmented LEA sample size by district region and wealth**

District wealth	Total	Region			
		Northeast	Southeast	Central	West/Southwest
<b>Total</b>	232	66	56	63	47
High	67	31	5	19	12
Medium	67	13	13	29	12
Low	59	11	26	12	10
Very low	39	11	12	3	13

**Table H-4. Participating LEA sample size by three stratification variables**

<b>Total</b>	Size			
	Very large	Large	Medium	Small
223	39	42	51	91
<b>Total</b>	Region			
	Northeast	Southeast	Central	West/Southwest
223	63	55	59	46
<b>Total</b>	District wealth			
	High	Medium	Low	Very low
223	62	65	57	39