Project Early Kindergarten evaluation update

General overview of results through 2007-08 of a Saint Paul Public Schools initiative

SEPTEMBER 2008

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September 2008

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Acknowledgments

We wish to thank Ann Lovrien, Project Early Kindergarten (PEK) assistant director, for her contributions to the ongoing evaluation and this report. We also wish to thank Kate Bonestroo and other staff of PEK, Allison Breininger and other staff of Resources for Child Caring, PEK school and child care teachers, principals at PEK schools, directors at PEK child care centers, PEK children and parents, and members of the PEK leadership team for their time and support of the program and study. Important contributions to the research and this report have also been made by Marian Heinrichs of Saint Paul Public Schools' Department of Research, Evaluation and Assessment; Vicki Hawley of the University of Minnesota's Center for Early Education and Development; and Angèle Passe, a consultant of the Saint Paul Public School District.

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Executive summary

Saint Paul Public Schools' Project Early Kindergarten program aims to improve the school readiness of Saint Paul children. The program offers a rigorous academic approach and targets children who are English Language Learners, come from low-income families, or need Special Education services. Ultimately, the program intends to help close Saint Paul's achievement gap.

The program began in 10 Saint Paul schools in fall 2005, and expanded to community child care settings a year later. PEK has since become the model for pre-kindergarten programs district-wide. As of fall 2008, 28 district elementary schools, 8 child care centers, and 13 family child care homes offer pre-kindergarten programs following the PEK approach. School sites offer the program to 4-year-olds, and child care sites to 2½- to 4-year-olds.

PEK aligns pre-kindergarten education with the district's K-12 curriculum model, the Project for Academic Excellence. The model emphasizes standards-based education and extensive professional development. With sensitivity to young children's developmental needs, PEK extends this model to early education, bringing children's preschool experience into alignment with the educational experience they will have in later years.

PEK is funded primarily by Saint Paul Public Schools and The McKnight Foundation, which provided an initial three-year grant in 2004 and renewed funding in 2007. PEK extends the program to child care settings through a partnership with Resources for Child Caring. The Minnesota Early Learning Foundation also contributes funds to the child care portion of the program.

Rigorous evaluation

PEK participates in a rigorous, independent evaluation conducted by Wilder Research. Children are tested over time and in developmentally appropriate ways. Evaluators compare children's academic and social skills in kindergarten and early elementary years to those of peers who did not participate in PEK.

School results

As of fall 2008, data are available for the first two cohorts of PEK school children. On average, these students experienced the following initial changes:

- In the year before kindergarten, PEK Cohort 1 children made faster progress than their peers nationally in vocabulary and early reading and writing skills, and expected progress in early math. Cohort 2 made even larger gains on average than Cohort 1 and faster progress than their peers nationally in all four areas.
- When they reached kindergarten, both Cohort 1 and Cohort 2 had academic skills that were substantially more advanced than those of similar, same-age children in a comparison group who had chosen but not yet received PEK.
- Both Cohort 1 and Cohort 2 also showed advantages compared to their kindergarten classmates, with differences stronger for Cohort 2. In all four academic areas assessed, Cohort 2 scored significantly higher on average than both classmates with and classmates without prior preschool or child care center experience.
- Teachers' ratings in kindergarten also suggest that overall, PEK tended to enhance social skills, lessen problem behaviors, and improve academic competence more than other experiences that classmates had prior to kindergarten.

- Between fall of kindergarten and fall of first grade, the academic and social advantages that Cohort 1 children seemed to gain from PEK appeared to lessen somewhat on average, although PEK students continued to show academic advantages over classmates without preschool or child care center experience.
- Principals, teachers, and parents provided very positive feedback about PEK.

Child care results

Having started a year later, PEK's child care component is at an earlier stage. As of fall 2008, data are available for 4-year-olds who participated in the child care component's first year. At this point, results are more suggestive than conclusive. On average, 4-year-olds in child care Cohort 1 experienced the following changes:

- Upon kindergarten entry, PEK child care Cohort 1 children appeared to have an advantage over classmates who did not participate in PEK on some academic measures, especially vocabulary.
- However, PEK school-based children appeared to have a slight advantage over PEK child care children on three of the four academic measures in kindergarten.
- In the areas of social skills and problem behaviors, child care Cohort 1 children did not appear to have any advantages compared to kindergarten classmates. Again, results were more positive for PEK school children.
- Overall, child care teachers provided very positive feedback about their experiences with PEK.

Issues to consider

A core component of PEK is the inclusion of an ongoing evaluation that can be used to inform programming. Based on results available to date, following are several issues that can be taken into consideration in future planning for PEK school and child care sites.

A complete list of issues for consideration and "lessons learned" to date from the evaluation are provided in Wilder Research's full report.

- PEK's impact on academic and behavioral skills was found to be larger in the second cohort of school-based children than the first. This suggests that PEK's benefits have increased as it has become more fully implemented, supporting the value of the program model. As the study continues, it will be instructive to see if impacts continue to increase as the program matures further.
- The success of PEK in increasing the skills of participants can result in larger skill differences between them and their classmates when they reach kindergarten. To ensure that all children are able to achieve substantial advances in kindergarten, it seems important that kindergarten instruction be differentiated to varying skill levels. Kindergarten teachers might find additional training and coaching in this area to be helpful.
- At this point results are available for only the first cohort of children participating in the child care portion of PEK. These results seem promising in some areas and also suggest room for improvement. PEK staff are using what they have learned to make program changes in their work with the second cohort of child care providers. It will be important for the study to examine whether results for children improve due to these changes.
- Particular attention may need to be paid to the socials skills and problem behaviors of children at child care sites. PEK staff can consider whether child care teachers could benefit from more training in this area.
- Some PEK school principals and teachers expressed concerns about current busing arrangements, such as young children riding with older children or being dropped off without an adult present. These concerns should be addressed.

Introduction

Program background

Overview

Project Early Kindergarten (PEK) aims to improve the school-readiness of Saint Paul children and help close the achievement gap through offering high-quality educational experiences for preschool children. The program aligns Saint Paul's pre-kindergarten education with the district's K-12 curriculum model, the Project for Academic Excellence. In this way, the program brings children's preschool experience close to the educational experience they will have in kindergarten and beyond. The program emphasizes standards-based learning, extensive professional development, and parent education and support. Because parents use a variety of care arrangements for their pre-kindergarten children, PEK promotes a community-wide approach involving both schools and child care programs.

The program targets services to English Language Learners, low-income children, and children needing Special Education services. In practice, most participants also represent racial or ethnic minorities. Participating children either attend a half-day, five-day-a-week school year program at one of the participating Saint Paul schools, or receive similar curricular support at their child care center or family child care home. PEK schools began serving 4-year-olds in fall 2005, and child care programs extended the program to 2½- through 4-year-olds in fall 2006.

PEK sites

Ten Saint Paul schools began offering PEK in fall 2005. These schools include Ames, Como Park, Dayton's Bluff, Four Seasons, Hayden Heights, Maxfield, Prosperity Heights, Wellstone, and World Cultures/American Indian Magnet, two schools which share a building and classroom. Since that time, PEK has become the model for all 4-year-old programs district-wide with the exception of Montessori programs. As of fall 2008, a total of 28 district elementary schools offer pre-kindergarten programs following the PEK approach.

PEK extends the program to child care settings through a partnership with Resources for Child Caring, a community agency working to improve the quality of early childhood care and education (Resources for Child Caring, n.d.). This community component of PEK is considered a pilot. The first cohort of partnering child care programs was asked to participate in PEK for two years, spanning the 2006-07 and 2007-08 school years. Six centers and 15 homes were originally selected to participate in the program, although

there was considerable staff turnover during this time as described in the community component section. A second cohort of providers began offering PEK in fall 2008. They include 7 child care centers that are new to PEK, 1 continuing center, and 13 new family child care homes. The program began training the new cohort of center directors and assistant directors in March 2008. Professional development for the new cohort of center teachers and family child care home providers began over the summer.

Evaluation

Wilder Research serves as the independent evaluator of PEK. The evaluation assesses the program at the 10 original school sites and at participating child care centers and family child care homes. For children attending at school sites, researchers use a quasi-experimental research design to assess impacts on children's academic success. The study also follows school-based children into their early elementary years to see if program effects are sustained through early elementary school. Children attending at child care sites are assessed in kindergarten to allow for comparisons at that time to children who attended PEK school sites and children who did not attend PEK. As with school cohorts, the third cohort of child care participants will also be assessed in the fall of their PEK year to facilitate measures of change between fall of PEK and fall of kindergarten. A complete description of research methods is provided in the Evaluation section of the report.

Funding

The program operates primarily through funding from Saint Paul Public Schools and The McKnight Foundation. In 2004 The McKnight Foundation provided a three-year, $2.8 million grant for program development and implementation, and in 2007 McKnight contributed an additional $3 million for efforts through the 2009-10 school year. PEK extends the program to child care settings through a partnership with Resources for Child Caring. The Minnesota Early Learning Foundation also contributes funds to the child care portion of the program.

Another facet of PEK, PEK-Early Reading First, operates under a federal grant and provides services at an additional two child care centers and two schools. Wilder Research conducts a separate evaluation of PEK-Early Reading First. Information on the program's initial year is available in report on Wilder Research's website (see Mohr, Gozali-Lee, & Mueller, 2008b). A report on the second year of PEK-Early Reading First will be prepared in fall 2008.

District pre-kindergarten consolidation

As of fall 2008, the Saint Paul Public School District is the process of consolidating pre-kindergarten programs district-wide under the PEK model. This consolidation unifies programs that previously operated separately, including Community Kindergarten, School Readiness, and classes initiated by principals and operating at a single school. District Montessori programs will continue to operate separately. In 2008-09, 28 district elementary schools are offering 4-year-old programs following the PEK approach. The district took the following steps to consolidate programs for the 2008-09 school year:

- Classes meet five days a week for two and a half hours a day (with the exception of the full-day PEK-Early Reading First program);
- Class times align with school start and end times to enable pre-kindergarten staff to participate in Professional Learning Communities and other school functions;
- Transportation is provided using the elementary school busing system (with separate busing provided for some Early Childhood Special Education children);
- Pre-kindergarten enrollment is processed by the district's Student Placement Center;
- Class sizes are capped at 20 students;
- Program management and staff supervision occur at the local school level under the direction of the principal, encouraging a team approach within the school;
- Early childhood professional development workshops and ongoing job-embedded coaching are standardized across programs;
- Using PEK's Early Childhood Workshop framework, pre-kindergarten curriculum and instruction is aligned with the district's Project for Academic Excellence elementary model, with a specific focus on alignment with kindergarten and first grade;
- Student, classroom, and program accountability measures are standardized;
- An Early Childhood Special Education (ECSE) inclusion model is maintained in 19 of the 28 schools;
- Parent education, family support, and student behavior support are provided district-wide;
- The Early Childhood Curriculum Resource center is made available district-wide; and

- Referendum funds are used to cover the cost of all pre-kindergarten general education teachers and assistants, and School Readiness state aid is used for program support for all pre-kindergarten program schools. Special Education covers all ECSE teachers, assistants, therapists, and social workers.

To ensure that gains made in its pre-kindergarten programs are sustained and built on in future years, the district is also working to connect pre-kindergarten with kindergarten and first-grade teachers. Efforts are currently underway to align programming during these early years and equip kindergarten and first-grade teachers to differentiate instruction based on the varying needs of incoming students. For example, in 2008-09 kindergarten teachers are receiving two full days of professional development in this area in September followed by three evenings during the year. PEK is also providing coaching to kindergarten teachers and building coaches in four schools to strengthen their capacity to differentiate instruction.

Contents of the report

This report comes at the conclusion of the fourth year of PEK. Following an initial planning year (2004-05), PEK has served children through the school component for three years (2005-06 to 2007-08) and through the community child care component for two years (2006-07 and 2007-08). This report summarizes the program's implementation and outcomes results to date, through the 2007-08 school year. As shown in Figure 1, at this point Wilder Research outcomes data are available for children attending the first two years of PEK at school sites and the first year of PEK at child care sites. This is an interim report, and future years' data will be provided in subsequent reports. It should also be noted that this report is intended for a broad audience, and includes references to more technical reports prepared by Wilder Research that provide additional background on methods and analyses.

1. Summary of outcomes data provided in this report

	Progress during PEK	Fall of kindergarten results compared to peers	Fall of 1st grade results compared to peers
School-based Cohort 1 (PEK 2005-06)	✓	✓	✓
School-based Cohort 2 (PEK 2006-07)	✓	✓	N/A[c]
School-based Cohort 3 (PEK 2007-08)	✓[a]	N/A[c]	N/A[e]
Community-based Cohort 1 (PEK 2006-07)	✓[b]	✓[d]	N/A[f]
Community-based Cohort 2 (PEK 2007-08)	✓[b]	N/A[c]	N/A[f]

[a] *Results of teachers' Work Sampling assessments are provided in this report. Data from Wilder Research assessments will be available following assessments conducted in fall 2008.*

[b] *Results of Individual Growth and Development Indicators administered to 4-year-olds by PEK staff are presented.*

[c] *These data will be available following assessments conducted in fall 2008.*

[d] *Results reflect 4-year-olds who attended community-based PEK in 2006-07.*

[e] *These data will be available following assessments conducted in fall 2009.*

[f] *These data are not being collected.*

The report begins by describing PEK goals and components, followed by a section on evaluation methods. The main body of the report then summarizes evaluation results to date. Results are separated into two sections: one on the school component and one on the community child care component. Both sections summarize student outcomes as well as implementation results. The final section of the report explores the lessons learned thus far in the evaluation. These lessons will be modified and expanded as the evaluation continues, and are intended to provide information that may be instructive to the early childhood education community and policymakers. The report concludes with an Appendix of figures providing supplemental information. It should be noted that throughout this report, "teachers" is used to refer to school teachers, child care center teachers, and family child care home providers.

Program goals and components

PEK's goals include providing programming aligned with the district's K-12 curriculum model and using a research-based approach to delivering services. Ultimately, the program intends to help close Saint Paul's achievement gap. Key program components include alignment with the Project for Academic Excellence, involving extensive professional development; parent education and support; and participation in a rigorous evaluation. This section and the following section on evaluation describe these program goals and components as well as the program's activities in these areas.

Central goals

PEK's central goals, as stated by the program, follow:

1. *School-based:* To develop optimal, developmentally and academically focused early childhood programming aligned with the District's K-12 standards-based comprehensive reform model, Saint Paul's Project for Academic Excellence, for 4-year-old English Language Learner students, Special Education students, and students who qualify for free and/or reduced-price meals.

2. *Community-based:* To use a research-based approach to deliver accurately targeted specialized services and support to early learners (primarily 3- and 4-year-old children), families, child care providers, and the greater local community that aligns with the district's standards-based comprehensive reform model and creates a smooth transition into kindergarten.

Alignment with the Project for Academic Excellence

With differences based on young children's developmental needs, PEK brings children's preschool experience into alignment with the educational experience they will have in kindergarten and beyond. This educational experience centers on the Project for Academic Excellence. The district introduced the Project for Academic Excellence in 2001 as a comprehensive academic reform model. Since that time, the Project for Academic Excellence has expanded from a pilot project in selected elementary schools to a district-wide approach implemented in every grade level. With the replication of PEK's model across 4-year-old programs, instruction aligned with the Project for Academic Excellence now extends to early education district-wide as well.

The Project for Academic Excellence model emphasizes standards-based education and extensive professional development. It aligns the district's curriculum model with state and national standards in reading, writing, math, and science. It also provides ongoing training for teachers and administrators based on national standards for effective training. Professional development includes best practices in standards-based instruction of core academic subjects. The model also emphasizes on-the-job coaching to help teachers develop lessons with clearly defined learning goals. Principals play an important role as instructional leaders who are involved in classrooms and oversee classrooms' implementation of the model (Saint Paul Public Schools, 2005).

In the district's own language, following are the 10 core components of the Project for Academic Excellence (Saint Paul Public Schools, n.d.):

1. Standards-based curriculum and instruction as the foundation of reform;
2. Extensive continuing professional development for teachers and administrators;
3. Focus on a small number of core academic skills;
4. Demonstration sites to promote replication;
5. A shared sense of instructional leadership across the school and district;
6. Content-based coaching of teachers, principals, and district leaders;
7. Availability of essential materials for learning;
8. Peer support for teachers;
9. Standards-based assessment to monitor progress; and
10. Increasing to scale across the district.

Early Childhood Workshop

Local and national experts in early childhood development and education developed a preschool curricular model for PEK aligned with the Project for Academic Excellence. This "Early Childhood Workshop" combines the Project for Academic Excellence's Reader's and Writer's Workshops. Contributors included the district's Reader's and Writer's Workshop professional development trainer and her consultant group, the California-based Foundation for Comprehensive Early Literacy Learning (CELL); the University of Minnesota's Center for Early Education and Development; English Language Learner, School Readiness, and Special Education staff; and Project for Academic Excellence and PEK staff.

Materials are geared toward the developmental needs of young children and are based on best practices in early childhood education. They emphasize specific standards in personal and social development, language and literacy, mathematical thinking, and physical development and health. The Early Childhood Workshop model is presented in a comprehensive implementation manual for teachers. Manuals also provide information on the Project for Academic Excellence and underlying Principles of Learning, PEK core content and early childhood standards, standards-based instruction, using standards-based assessment to monitor progress, and other topics relevant to program goals. Separate editions of the manual are provided to PEK school and child care teachers (Saint Paul Public Schools, 2007b).

At school sites, licensed teachers use the implementation manual to develop lesson plans and integrate lesson themes throughout the classroom environment. Reflecting their unique needs and operations, child care centers use their manual in conjunction with *Doors to Discovery,* a complete literacy-focused curriculum. Family child care homes use their manual along with a theme-based curricular model developed specifically for them. Beginning in the 2007-08 school year (Cohort 3), school classrooms also implemented *Everyday Mathematics,* a curriculum used in district kindergarten through sixth-grade classes.

Professional development

Consistent with the Project for Academic Excellence, PEK emphasizes extensive ongoing professional development and on-the-job coaching for participating school and child care teachers. For school teachers, this training builds on the required educational credentials of teaching licenses and preschool certification. As an indication of the program's investment in training, it supports three Resources for Child Caring coaches, five school coaches for pre-kindergarten and kindergarten classrooms, national literacy consultants, a "master coach" consultant, and a community and family specialist who promotes the program's parent education efforts. At the beginning of the second grant period, the program also hired one additional part-time parent educator supported by the Minnesota Early Learning Foundation.

Teachers attend an intensive training workshop at the beginning of the school year, spanning three days for school teachers and one or two days for child care teachers. During the year, school teachers meet in regular Professional Learning Communities and child care teachers attend monthly training meetings. Both school and child care teachers also participate in one-on-one weekly or biweekly coaching sessions. Program coaches, in turn, participate in master coaching sessions. School and child care teachers receive training on the following topics, for example: the role of rituals and routines; standards-based instruction; progress monitoring to guide data-driven instruction; reading and

writing strategies, including read alouds, shared reading, interactive writing, active learning, and guided oral reading; the Principles of Learning, which underlie the Project for Academic Excellence; and parent education. PEK also arranges for school and child care teachers and school principals to visit other PEK sites. Professional development is also provided to school principals and child care center directors and assistant directors to equip them to assume the role of the instructional leader at their school or center. Child care center directors receive six months of monthly training before their teachers begin working with the program.

Principals and center directors as instructional leaders

A tenet of the Project for Academic Excellence is that principals assume the role of the instructional leader at their school. Likewise, principals at PEK schools and directors at participating child care centers assume the role of the instructional leader of PEK at their site. This role provides site-level accountability for fidelity with the program model. At schools, the role also facilitates PEK's integration into the school as a whole. The program places a strong emphasis on developing linkages between PEK, kindergarten, and early elementary teachers as a way of ensuring smooth transitions for students and curricular alignment across grade levels. The role is new for child care centers as of fall 2008, and is intended to equip center directors to provide initial training to new teachers who start after the intensive training workshop at the beginning of the year.

School principals and center directors receive professional development to prepare them for assuming this role. Program coaches also provide them with memos to guide them in making classroom observations. These memos describe instructional best practices from the latest professional development teachers have received that should be evident in the classroom. Since fall 2007, program administrators, principals, and child care center directors have also conducted "Progress Monitoring Walks" to check fidelity of program implementation.

Progress monitoring

The Project for Academic Excellence emphasizes ongoing progress-monitoring. PEK teachers use developmentally appropriate tools to monitor progress in children's skills and their growth toward developmental milestones. Work Sampling System assessments and Individual Growth and Development Indicators (IGDIs) help teachers understand changes in individual children. They also alert teachers when a child may require more intensive interventions. As with their K-12 counterparts, PEK teachers use information gathered through ongoing assessments to inform their instruction.

Parent education and support

PEK also emphasizes parent involvement in their children's learning as well as parent-school connections. Program supports work to increase parents' understanding of the skills children need for school, and parents' engagement with their children in literacy activities at home. They also aim to help parents feel comfortable navigating the school system and participating in school activities. Parent-education efforts are coordinated by the program's community and family specialist as well as a part-time parent educator who works to connect child care families with neighborhood schools.

PEK developed extensive parent-education materials, titled "School and Home – Partners in Learning," that were implemented in 2007-08. Materials include literacy activities that parents can do with children at home. Math activities were added for the 2008-09 school year. Twice a month, parents also receive take-home information in different languages that reinforces skills being taught in PEK and explains how to use the literacy materials. Parents also receive information about community resources. To facilitate home learning over the summer, teachers also distributed summer writing kits to PEK school and child care children who were going on to kindergarten.

In addition to developing parent-education materials, PEK offers parenting events and parent-education sessions at the schools, and brings school services to child care centers. For example, the program offers parent orientations at the schools and provides welcome packets with information about transitioning to school. As another example, PEK provides "Understanding School Choice" sessions at participating child care centers during which district student placement staff answer parents' questions and help parents register their children for kindergarten and Early Childhood Screening.

Program guidance

During the program's first four years, a PEK leadership team met bimonthly to discuss program policies and provide program guidance. Through the 2007-08 school year, this team focused on implementation of PEK at the original 10 PEK schools and participating child care sites. Members included district administrators and professional development staff as well as representatives from community-based early childhood organizations, the University of Minnesota, The McKnight Foundation, the City of Saint Paul, and Wilder Research. The leadership team is now being reconstituted to reflect district efforts to extend PEK's model across 4-year-old programs district-wide. As part of this consolidation, the PEK leadership team and the School Readiness advisory council are merging into one group which will begin meeting in fall 2008.

Evaluation

PEK participates in a rigorous evaluation. The program views evaluation as an important sustainability strategy in that ultimately, the evaluation will provide evidence of whether the model warrants replication. The evaluation includes two components: an implementation evaluation and an outcomes evaluation. Wilder Research holds primary responsibility for the evaluation, with support and assistance from Saint Paul Public Schools' Department of Research, Evaluation and Assessment.

Program implementation

The implementation evaluation addresses the overarching question, Does PEK provide a high-quality preschool program that is aligned with the Project for Academic Excellence and integrated into the school system? The implementation evaluation also assesses the degree to which PEK is serving the target population of high-need students, as well as parent involvement and school-family linkages.

Researchers gather information on the children served and the extent to which schools and child care settings are implementing the program. Information is gathered from surveys and focus groups conducted by Wilder Research, records data provided by the district and PEK staff, and observations conducted and reports prepared by the program's evaluator from Saint Paul Public Schools and staff of the University of Minnesota's Center for Early Education and Development. Principal and teacher surveys provide information on principals' perceptions of PEK implementation and teachers' interactions with parents. Parent surveys provide information on their involvement in their children's learning and school activities, their satisfaction with PEK, and children's prior educational experiences and family background. Focus groups with child care teachers and directors provide feedback on their experiences with the program. To gather information about how the program is implemented in each setting, outside observers use structured questionnaires. Additionally, school and program records provide information about student enrollment, demographics, and attendance at PEK.

Program outcomes

Wilder Research's evaluation focuses on the program's outcomes. It answers the key question, Does a high-quality preschool program aligned with the Project for Academic Excellence improve students' educational outcomes? To answer this, evaluators need to know the following:

- Are children better prepared for kindergarten because they participated in PEK?
- Do they perform better in elementary school (kindergarten through third grade)?
- What are the benefits for children, families, and teachers of having pre-K programs integrated with schools?
- Is it cost-effective?

Wilder Research addresses these questions through a quasi-experimental research design. Children are tested over time and in developmentally appropriate ways to see how they progress academically and socially, and whether program effects are sustained through early grade school. The study compares a treatment group of children who received PEK services with a comparison group who did not. Experimental research, involving random assignment to treatment and control groups, can be difficult to attain in education research. This quasi-experimental approach presents a rigorous alternative. While the study will not be able to prove absolutely that PEK causes specific outcomes, researchers will be able to draw reasonable inferences about the changes that can be attributed to the program.

The study's design and its use of nationally validated assessment instruments also allow researchers to compare PEK results with results from other public school-related preschool programs around the country. The *Peabody Picture Vocabulary Test III* (PPVT III) measures receptive vocabulary, and three subtests of the *Woodcock-Johnson III Tests of Achievement* (WJ III) measure early skills in reading, writing, and math. Wilder Research staff administer these tests one-on-one with children at the school sites each fall. Teachers also complete assessments of individual students in the fall. They assess students' social skills, problem behaviors, and academic competence on the *Social Skills Rating System* (SSRS). Figure 2 provides the study's assessment schedule over the five-year period from 2005-06 to 2009-10. More detailed information about the school and child care portions of the study are provided following the figure.

2. PEK assessment schedule, 2005-06 to 2009-10

Groups	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Spring 2010
SCHOOL COMPONENT						
Cohort 1:						
PEK students	PEK	Kindergarten	First grade	None[c]	None	Third grade[d]
Classmates[a]	None	Kindergarten	First grade	None[c]	None	Third grade[d]
Cohort 2:						
PEK students		PEK	Kindergarten	First grade	Second grade	None
Classmates[a]		None	Kindergarten	First grade	Second grade	None
Cohort 3:						
PEK students			PEK	Kindergarten	First grade	None
Classmates[a]			None	Kindergarten	First grade	None
COMMUNITY (CHILD CARE) COMPONENT						
Cohort 1		None[b]	Kindergarten	None	None	None
Cohort 2			None[b]	Kindergarten	None	None
Cohort 3				PEK[b]	Kindergarten	None

[a] *"Classmates" refers to the comparison group students who attended kindergarten at the 10 PEK schools and who did not attend PEK at school or child care sites.*

[b] *Individual Growth and Development Indicators (IGDIs) are used in PEK child care. For child care Cohort 3 only, the PPVT III and WJ III are also administered in fall of PEK (fall 2008) to children who will attend kindergarten the following fall.*

[c] *Cohort 1 school students who participated during the program's initial year of implementation will not be assessed in second grade.*

[d] *MCA-IIs in reading and math plus SSRS.*

Note: *Unless otherwise noted, this assessment schedule pertains to the WJ III, PPVT III, and SSRS. If funding permits, Cohorts 2 and 3 at PEK school sites will also be followed into third grade (2010-11 for Cohort 2 and 2011-12 for Cohort 3).*

PEK school sites

For children attending the 10 PEK schools, the study assesses the following program outcomes: 1) the progress they make during PEK, and 2) the impact of PEK on their later academic performance. Progress during PEK is measured by comparing children's baseline (fall of PEK) test scores with their scores one year later, in the fall of kindergarten. To measure PEK's impact, the study compares PEK participants' academic and social skills to those of their peers over time, as described below.

Comparisons to peers

Using the assessments mentioned earlier, children attending PEK schools are compared to two different groups of peers. First, they are compared to similar children who applied and were accepted for PEK, but who have not yet attended the program. In this analysis, children who just finished PEK constitute the "treatment" group, and children who are just beginning PEK constitute the "no-treatment" comparison group. Because children develop rapidly at this age, Wilder Research uses a statistical model that estimates the difference between the two groups right at the program's September 1 birthday cutoff point. Near the cutoff point, children from both groups are essentially the same age but treatment-group children have completed the program and comparison-group children have not. This analysis provides a comparison of children with similar characteristics, and eliminates the selection bias that can occur if families who choose to enroll their children in the program differ in important ways from those who do not. This analysis is referred to as the "birthday cutoff" method, illustrated in Figure A1.

Second, once PEK children reach kindergarten, they are compared to their kindergarten classmates. These classmates may differ in some ways from PEK children. They have had a range of prior preschool and child care experiences, and some have had no formal preschool or child care experiences at all. This comparison reveals how developmental skills of PEK children compare to skills of kindergartners coming from a variety of backgrounds.

Comparisons over time

To see whether program effects last over time, PEK school children and their classmates are assessed in subsequent years as well. The study will continue to follow these two groups through third grade, as funding permits. The same assessments of academic and behavioral progress described earlier will be used in these early primary grades, with the exception of third grade when the *Minnesota Comprehensive Assessments–Series II* will be used.

It should be noted that the classmate comparison group is defined as children who: a) are kindergarten classmates of former PEK children, and b) attend kindergarten at one of the

10 PEK school sites. PEK children are followed in kindergarten as long as they remain in any public (including charter) or private school in Saint Paul. After kindergarten, both the former PEK school students and the comparison group are followed as they move through the primary grades as long as they remain in schools in Saint Paul.

PEK child care sites

In the child care component, the evaluation of program outcomes is similar to but not as extensive as the evaluation of the school-based component. Wilder Research will assess academic progress during the PEK year for children in child care Cohort 3, who will be assessed in both the fall of PEK and the fall of kindergarten. Children in child care Cohorts 1 and 2 are being assessed in kindergarten only. For all three child care cohorts, PEK's impact will be assessed in fall of kindergarten but not later years. In kindergarten, evaluators compare PEK child care participants' academic and social skills to those of their kindergarten classmates and those of students who attended the PEK school component. These comparisons are based on the same assessments used in the school component (i.e., the PPVT III, WJ III, and SSRS).

Other measures

In addition to the child assessments conducted as part of the evaluation, teachers also use formal tools to monitor individual children's progress over the course of the year. These tools include Work Sampling System assessments and Individual Growth and Development Indicators (IGDIs). Although not formally a part of the evaluation, these results are discussed briefly in the context of other student outcomes presented in this report. Finally, once sufficient data are available, Wilder Research's chief economist plans to conduct a cost-effectiveness analysis of the program. The analysis will be based on placing PEK findings in the context of other studies following participants over longer periods of time.

Statistical significance

In some cases, this report refers to differences between groups that are "significant." By significant, we mean that the difference is significant at the 0.05 level based on a statistical test. In other words, there is less than a 1 in 20 probability that the difference occurred by chance.

Progress summary: School-based PEK

This section provides results available to date for the 10 PEK schools. The section begins by profiling children who attended PEK schools during the program's first three years, 2005-06 (Cohort 1), 2006-07 (Cohort 2), and 2007-08 (Cohort 3). Their progress during PEK is then discussed, based on Wilder Research's assessments for Cohorts 1 and 2 and teachers' Work Sampling assessments at this point for Cohort 3. Academic and social outcomes are then provided for the first two cohorts based on Wilder Research's assessments. After summarizing student outcomes, this section explores program implementation through the 2007-08 school year. The section concludes with a list of issues for consideration that can be used to inform ongoing program planning efforts.

More specifically, this section addresses the following topics for the school component:

- Overview of results
- Characteristics of children (Cohorts 1-3)
- Progress while in PEK (Cohorts 1-3)
- Kindergarten readiness compared to similar children (Cohorts 1 and 2)
- Kindergarten readiness compared to classmates (Cohorts 1 and 2)
- Differences in first grade compared to classmates (Cohort 1)
- Implementation efforts (Cohorts 1-3)
- Issues for consideration

Overview

Results show promising progress for children attending PEK schools in 2005-06 (Cohort 1) and 2006-07 (Cohort 2). Both groups showed academic and social advantages over peers when they reached kindergarten. As might be expected, results were stronger for children attending PEK the second year when the program was more fully implemented. By first grade, differences between PEK students and their kindergarten classmates had narrowed for the first group of PEK students to reach first grade. Data gathered over the next few years will help researchers make stronger claims about the program's initial and longer-term impacts.

On average, children in the initial school cohorts experienced the following changes:

- In the year before kindergarten, PEK Cohort 1 children made faster progress than their peers nationally in vocabulary and early reading and writing skills, and expected progress in early math.

- While Cohort 1 made impressive gains while in PEK, Cohort 2 appears to have made even faster progress during their PEK year. Cohort 2 children had larger gains on average than Cohort 1 in each of the four academic areas, and also made faster progress than their peers nationally in all four areas.

- When they reached kindergarten, both Cohort 1 and Cohort 2 had academic skills that were substantially more advanced than those of same-age children who had chosen but not yet received PEK. These findings are based on the "birthday cutoff" analysis.

- Compared to their kindergarten classmates, Cohort 1 children scored higher on average in all four academic areas than both their classmates with and without other preschool or child care center experiences. Compared to those who had other school experiences before kindergarten, differences were statistically significant in vocabulary.

- Differences compared to kindergarten classmates were even stronger for Cohort 2. When they reached kindergarten, they scored higher on average in all four academic areas than both classmates with and classmates without prior school experience. Differences between former PEK children and both classmate groups were statistically significant in all four academic areas.

- Teachers' ratings in kindergarten also suggest that overall, PEK tended to enhance social skills, lessen problem behaviors, and improve academic competence more than other experiences that classmates had prior to kindergarten. Again, results were stronger for Cohort 2 than Cohort 1.

- Between fall of kindergarten and fall of first grade, the academic and social advantages that children seemed to gain from attending PEK seemed to lessen somewhat. During that year, kindergarten classmates made faster progress than their PEK peers in each of the four academic areas.

- Despite their classmates' faster progress, former PEK students continued to show academic advantages in fall of first grade over their classmates without preschool or child care center experience. Academic and social skills advantages over classmates *with* preschool or child care center experiences were no longer evident.

Key evaluation findings to date also include the following:

- Compared to publicly funded pre-kindergarten programs in several other states, the estimated effect of PEK tended to be larger based on results of the first two cohorts.
- Principals, teachers, and parents provided very favorable feedback about the program.
- Overall, structured classroom observations found that PEK classrooms have achieved a high level of alignment with the Project for Academic Excellence and are strong in their intentional supports for language and literacy.

Characteristics of children

Ten Saint Paul elementary schools began offering PEK to 4-year-olds in fall 2005. Between morning and afternoon sessions, these schools have the capacity to serve a total of 360 PEK children. Figure 3 shows the number of children in the first three cohorts at PEK school sites. It is important to note that these numbers reflect most but not all children who have participated in the program. Wilder Research defines each cohort as those who are assessed in fall of their PEK year, and there have been some participants who were not assessed as part of the study. Some children were not assessed because they started the program later in the year, left the program in the fall, transferred schools, were absent, or did not have parental permission to participate in the assessments.

3. Children attending PEK school sites, 2005-06 to 2007-08

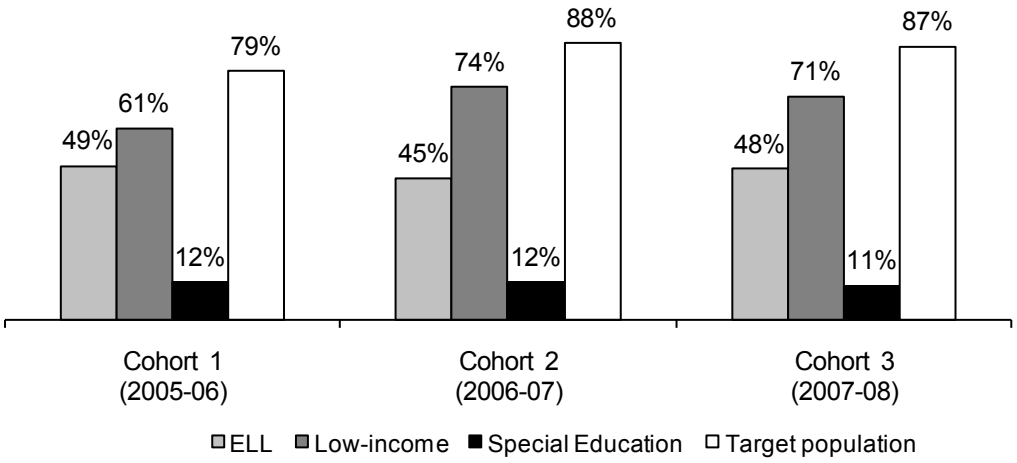
Cohort	Number of children
Cohort 1 (PEK 2005-06)	326
Cohort 2 (PEK 2006-07)	329
Cohort 3 (PEK 2007-08)	312
Total	**967**

Note: *A total of 360 children can be served by the 10 PEK schools. Wilder Research defines each cohort as children who were assessed as part of the study in fall of their PEK year. As explained in the text, this definition includes most but not all children who have participated in the program. Numbers in this figure may also differ slightly from those in other figures in this and other PEK reports depending on the inclusion or exclusion of children tested in Spanish, children whose birth date was outside the range for their cohort based on the program's birthday cutoff date, and children completing only the Peabody or the Woodcock-Johnson but not both. There may also be variations based on missing data for some variables.*

Demographics

Figure A2 in the Appendix provides demographic profiles of students in school-based Cohorts 1, 2, and 3. Some demographic characteristics can change over time, and these profiles reflect demographic data from fall of the PEK year. In each year, a majority of PEK students were low-income (61-74%), defined here as eligible for free- or reduced-price lunch. Just under half were English Language Learners (45-49%). Among those with a primary home language other than English, Hmong was the most common home language followed by Spanish. More than 1 in 10 children in each cohort needed Special Education services (11-12%). Looking at these three categories together, 79-88 percent were in the program's target population across the three years, meaning they were either low-income, English Language Learners (ELL), or needed Special Education services. Additionally, most students were from racial or ethnic minorities (81-85%). Figure 4 depicts the representation of PEK's target populations in the first three cohorts.

4. PEK school component. Representation of PEK target populations, 2005-06 to 2007-08



Note: *PEK targets children who are English Language Learners (ELL), from low-income families, or need Special Education services. "Target population" reflects the percentage of children who are in any of these three groups.*

Comparison group demographics

Demographic characteristics of the classmate comparison groups are not presented in this report (see Mueller & Gozali-Lee, 2007; Mueller, 2008). However, in cases where former PEK students differed in meaningful ways from the comparison groups in kindergarten or first-grade, we statistically adjusted for those demographic differences in our analysis. We also adjusted for any differences among the groups based on when in the fall they were tested.

Changes over time

It is important to note that in some cases, children's demographic characteristics can change over time. For example, it may not be known that a child needs Special Education services until after that child has been in the school system. As another example, a child may be eligible for free or reduced-price lunch one year and ineligible another year. Additionally, methods for obtaining PEK children's demographic characteristics changed in 2006 after the district introduced a new application process for 4-year-old programs that collects applicants' demographic information.

Changes due to attrition

Demographics presented here reflect all students in the original PEK cohorts. However, attrition occurs over time in the study. Subsequent years' analyses reflect only those students who were tested in a given year. Children attending PEK at school sites are followed after their PEK year as long as they remain in schools in Saint Paul. Children attending kindergarten or first grade outside of Saint Paul are not reflected in analyses presented in this report for fall of those years. Attrition also occurs in the comparison groups. Comparison groups are defined as kindergarten classmates of PEK children at the 10 PEK schools. After kindergarten, comparison group students are followed as long as they remain in schools in Saint Paul.

Figure 5 shows the number of PEK and comparison group children who were assessed in fall 2007. At that time, Wilder Research conducted assessments with 1,376 children who attended PEK school sites in Cohorts 1-3, and their comparison groups. Based on the numbers in Figure 3, we were able to assess 73 percent of the original Cohort 1 children when they were in first grade, and 81 percent of the original Cohort 2 children when they were in kindergarten.[1] An additional 22 children were assessed in Spanish in fall 2007, but they were excluded from this figure and subsequent analyses because English- and Spanish-language test scores are not directly comparable.

[1] Based on slight differences in Ns as explained in Figure 3, the technical report on PEK fourth-year evaluation results (Mueller, 2008) reported that 74 percent of Cohort 1 school children were assessed in fall 2007.

5. PEK school component. Fall 2007 study groups

Study groups	Number assessed[a]
Cohort 1 (PEK 2005-06)	239
Cohort 1 comparison[b]	277
Cohort 2 (PEK 2006-07)[c]	268
Cohort 2 comparison[d]	296
Cohort 3 (PEK 2007-08)	296
Total	**1,376**

[a] *Excludes students assessed in Spanish (n=22).*

[b] *Kindergarten classmates of PEK school -based Cohort 1 children in 2006-07 at the 10 PEK schools.*

[c] *Six children who attended PEK child care in 2006-07 also attended PEK at school sites in 2006-07. These children are included in the school-based component Cohort 2 numbers.*

[d] *Kindergarten classmates of PEK school -based Cohort 2 children in 2007-08 at the 10 PEK schools.*

We compared the fall of PEK (baseline) demographics and test scores of these children to those of children who remained in the study to see if they differed in important ways. For both Cohort 1 and Cohort 2, those assessed in fall 2007 appeared to closely resemble the original cohort. In fall of first grade there were some differences in the Cohort 1 comparison group compared to the original fall of kindergarten comparison group, and those differences are noted in the description of first-grade results.

Home life

Most PEK school children participating the first three years lived with both parents (70-73% in Cohorts 1, 2, and 3), and more than 1 in 10 lived with their mother only (15-17%). Quite frequently other adult relatives also lived in the household. A majority of children's parents graduated from high school or attended some college but did not receive a four-year degree (67-69% of mothers and female caretakers, and 63-68% of fathers and male caretakers) in Cohorts 1, 2, and 3.

School experience

Children often enrolled in PEK without any prior preschool or child care experience. About 4 in 10 attended preschool, Head Start, or a child care center before they started PEK (36-40% in Cohorts 1, 2, and 3). Children also were typically not in another preschool or child care program while they attended PEK. When not in their PEK class, children were most commonly cared for by parents (45-47% in Cohorts 1, 2, and 3).

Other common arrangements involved – sometimes in combination with parental care – care from relatives, neighbors, or friends.

Progress while in PEK

For each cohort, progress during their PEK year is measured by comparing their fall of PEK (baseline) test scores with their fall of kindergarten test scores. Comparisons are made based on the Peabody and Woodcock-Johnson academic assessments conducted by Wilder Research.

Cohort 1

Academic assessments

Changes compared to national peers

PEK school-based Cohort 1 students made substantial gains in academic skills in the year before kindergarten. Using the Peabody and Woodcock-Johnson tests, we compared students' scores when they started PEK (fall 2005) with their scores when they started kindergarten (fall 2006). Because children develop rapidly at this age, we looked at how their progress compared to how much children of this age would be expected to progress based on national norms. Compared to their peers nationally, Cohort 1 students made accelerated progress in vocabulary, early reading, and early writing. In other words, they made faster progress over the course of the year than their peers nationally in these areas. They made normative progress in early math, which was not surprising given that math was not a focus during the program's first year of implementation (Figure A3; Mueller & Gozali-Lee, 2007). The program implemented the *Everyday Mathematics* curriculum in fall 2007.

Despite their accelerated progress in reading and expected progress in math, on average former PEK students were somewhat below national norms in vocabulary and early math skills in fall of their kindergarten year. This does not seem surprising given the program's large ELL population and that math was not a focus during the program's initial year. These students were slightly above national norms in early reading and writing skills in the fall of their kindergarten year, on average (Mueller & Gozali-Lee, 2007).

Variations among demographic groups

Looking at specific groups targeted by the program, English Language Learners and low-income students made larger gains than other PEK children in some areas. Participants from some racial or ethnic minority groups also made larger gains than White students in some areas. Although some of their peers made more progress, White students and

higher-income students still scored higher on average than other groups of PEK children (Mueller & Gozali-Lee, 2007).

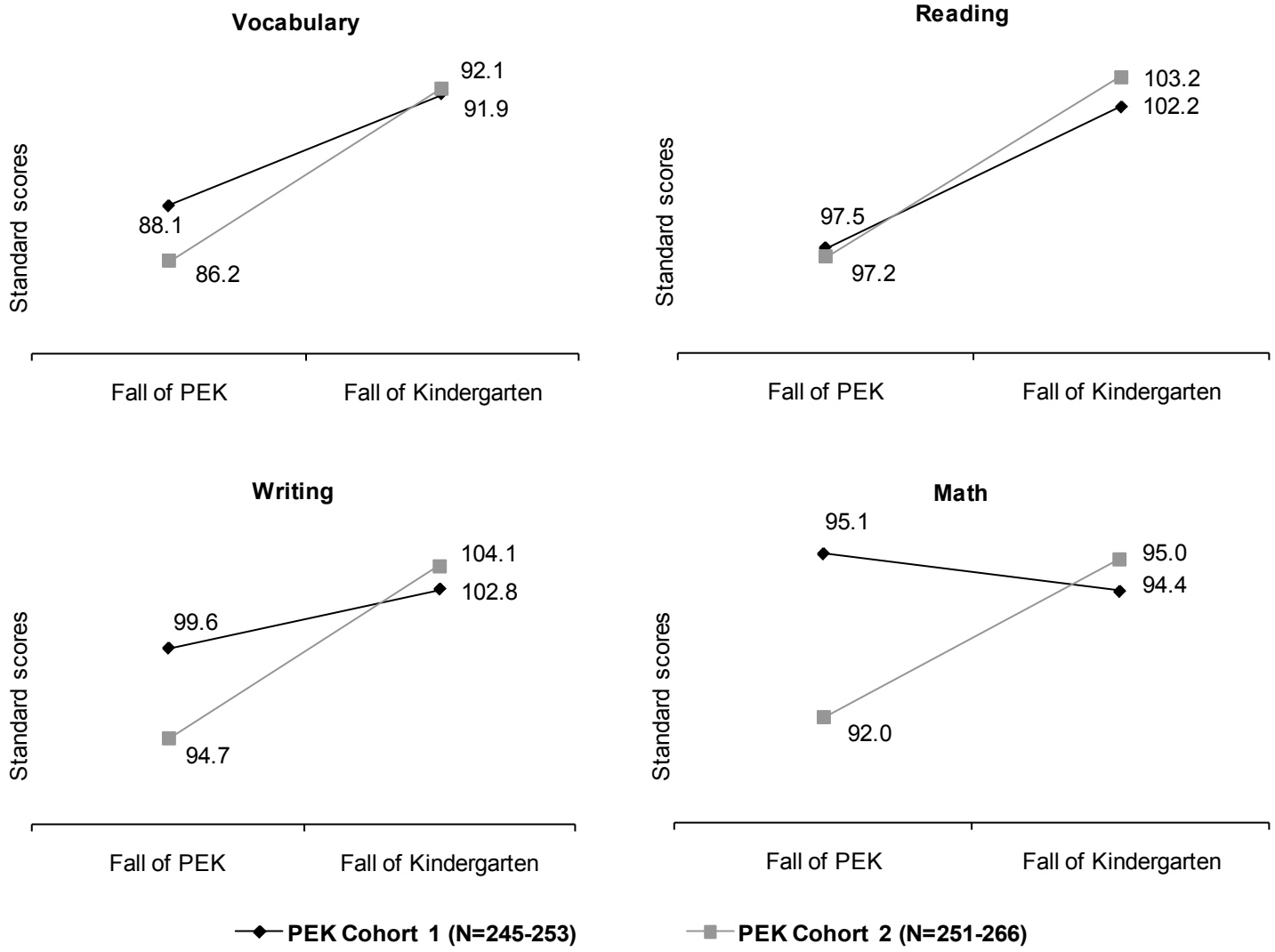
Cohort 2

Academic assessments

Changes compared to Cohort 1 and national peers

Compared to Cohort 1, the second cohort of PEK children made even stronger gains while in the program. This would be expected based on the program's more complete implementation during its second year of operation in schools. Cohort 2 children started PEK with slightly lower scores on average than Cohort 1 in each of the four academic areas. By the time they reached kindergarten, Cohort 2 children's scores were slightly higher on average than Cohort 1 children's in each of the four areas (Mueller, 2008; Figure A3). Figure 6 depicts the progress of Cohort 2 compared to Cohort 1 during the pre-kindergarten year.

6. PEK school component. Changes in academic test standard scores from PEK to kindergarten: PEK Cohort 1 (fall 2005 to fall 2006) vs. PEK Cohort 2 (fall 2006 to fall 2007)



Notes: *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample. These scores are also age-standardized. This means that no change in scores from one year to the next indicates normative progress, positive change indicates accelerated progress, and negative change indicates slower progress in comparison to one's peers. One-year changes in standard scores were statistically significant for each group in each subject, with the exception of Cohort 1 children in math (see Figure A3).*

Further, in all four areas Cohort 2 children's progress was accelerated compared to their peers nationally, meaning it was faster than would be expected based on typical development. Whereas Cohort 1 students made expected progress in math during their PEK year, Cohort 2 students made accelerated progress in this area compared to their peers nationally. Still, progress in math lagged behind progress seen in the other three academic areas (Mueller, 2008; Figure A3).

Similar to Cohort 1, Cohort 2 students remained below the national average in vocabulary and early math skills, despite their progress in these areas. Again, this does not seem surprising given the program's large ELL population and that the *Everyday Mathematics* curriculum was not introduced until fall of Cohort 3's PEK year (fall 2007). As with Cohort 1, Cohort 2 students were above national norms in early reading and writing skills in the fall of kindergarten, on average (Mueller, 2008; Figure A3).

Age-equivalent results

Translating results into age-equivalency scores provides another meaningful way of looking at these changes. In vocabulary, Cohort 2 children were estimated to be at 3 years 6 months in the fall of PEK on average, and at 5 years 0 months in the fall of kindergarten on average, for an 18-month gain. In comparison, Cohort 1 children were estimated to have experienced a 15-month gain in vocabulary on average. Similarly, Cohort 2 children were estimated to have experienced a 16-month gain in early reading skills during their pre-kindergarten year, compared to a 14-month gain for Cohort 1. It should be noted, though, that age-equivalency scores are a less exact measure than standard scores, which are used in other analyses presented here. For this reason, in age-equivalency terms it appears that Cohort 2 children made the same size gains as Cohort 1 children in early writing and math, even though Cohort 2 children had larger gains in these areas using standard scores (Mueller, 2008; Figure A4).

Variations among demographic groups

For the most part, Cohort 2 children's progress was similar across demographic categories. ELL students made larger math gains than non-ELL students, and Special Education students made larger math gains than students not in Special Education, on average. American Indian students also made larger vocabulary gains than White students on average, although this was based on a very small number of American Indian students (Mueller, 2008).

Cohort 3

Work Sampling

Wilder Research's analysis of Cohort 3 children's progress during PEK will be conducted following those students' kindergarten assessments in fall 2008. In the meantime, there are teacher ratings available for this third cohort. PEK teachers conducted Work Sampling System assessments three times over the course of the year to look at students' growth in personal and social development, language and literacy, and mathematics. These assessments are curriculum-embedded, meaning they are based on teachers' observations and documentation in the context of regular classroom activity. Overall, results for Cohort 3 students show progress from fall to winter to spring in each of the three domains. The personal and social development domain had the highest percentage of students rated proficient in the spring (76%), followed by language and literacy (72%), and mathematics (65%). Across the domains, only 4 to 5 percent were rated as not yet demonstrating the skill or knowledge in the spring (Heinrichs, 2008). Researchers will be better able to interpret the progress of Cohort 3 school children once their fall of PEK and fall of kindergarten Peabody and Woodcock-Johnson results can be compared.

Kindergarten readiness compared to similar children

Kindergarten readiness is assessed in two ways: 1) by comparing PEK children to similar children who applied and were selected for PEK but who have not yet participated, and 2) by comparing PEK children to their kindergarten classmates. This section discusses kindergarten readiness compared to similar children selected for PEK. The comparison is based on the Peabody and Woodcock-Johnson academic assessments conducted by Wilder Research.

Using the "birthday cutoff" method described earlier, children who just finished PEK are compared to children who are just beginning the program. An advantage of this analysis is that it minimizes the selection bias that could occur if there were differences between families who chose PEK for their children and families who did not. Children who just finished PEK constitute the "treatment" group, and children who are just beginning PEK constitute the "no-treatment" comparison group. Again, because children in the two groups are different ages, a statistical model is used to estimate the difference in scores between the two groups right at the program's September 1 birthday cutoff date for enrollment. At this point, the two groups are essentially the same age, but one has participated in PEK and the other has not. To date, the birthday cutoff analysis has been conducted twice: once when Cohort 1 was beginning kindergarten (treatment group) and Cohort 2 was just beginning PEK (no-treatment group), and once when Cohort 2 was beginning kindergarten (treatment group) and Cohort 3 was beginning PEK (no-treatment group).

In some cases we found that the two groups being compared differed in their demographic characteristics or baseline test scores, and we made adjustments in the analyses to account for those differences. We also made adjustments based on when in the fall each child was tested. Even though we made adjustments, it is important to note that we have some reservations about the birthday cutoff method based on the differences in baseline (fall of PEK) test scores between treatment and comparison groups. These differences suggest that assumptions about the equivalency of the two groups when they started PEK did not hold in some cases, and it is possible that our adjustments may not have entirely corrected for the impact on results (Mueller, 2008).

Cohort 1

Academic assessments

Based on the birthday cutoff analysis, when PEK school-based Cohort 1 children started kindergarten they were considerably ahead of same-age children who had chosen but not yet received PEK. Again, this is based on statistical estimates of differences between Cohort 1 and Cohort 2 at the program's September 1 birthday cutoff date, where they were essentially the same age. Cohort 1 had completed PEK, and Cohort 2 was just beginning the program. There were statistically significant differences in vocabulary, reading, writing, and math test scores at the birthday cutoff date in favor of children who had attended PEK. The size of the PEK impact on scores is estimated to be between medium and large for vocabulary, writing, and math, and close to large for reading (Figure A5; Mueller & Gozali-Lee, 2007).

In age-equivalency terms, this analysis found a difference of 12 months between the two groups in their vocabulary scores. This means that children who attended PEK were estimated to be 12 months ahead of where they would have been without attending the program. Children who attended PEK were estimated to be eight months ahead in reading, nine months ahead in writing, and six months ahead in math compared to where they would have been without participating in PEK (Figure A6; Mueller & Gozali-Lee, 2007). As has been seen in some other analyses of PEK results, a look at the impact within individual demographic groups suggests that Cohort 1 White students benefited less from the program than other students (Mueller & Gozali-Lee, 2007).

Cohort 2

Academic assessments

A year later, we conducted the birthday cutoff analysis when Cohort 2 was entering kindergarten and Cohort 3 was entering PEK. In this case, Cohort 2 served as the "treatment" group and Cohort 3 as the "no-treatment" comparison group. Again, we used a statistical model to estimate differences between the two groups at the program's birthday cutoff point, where the groups were essentially the same age. As with the initial analyses based on Cohorts 1 and 2, results again indicated that the academic skills of children who had participated in PEK were substantially more advanced than same-age children who had chosen but not received the program.

In the areas of vocabulary, reading, and writing, we found statistically significant differences in test scores at the birthday cutoff date. The size of the PEK impact was estimated to be between medium and large for vocabulary and reading, and large for early writing skills. In math, the size of the PEK impact was estimated to be between small and medium, which was probably at least partially due to the high math scores of Cohort 3 at baseline compared to Cohort 2. In age-equivalency terms, PEK children were estimated to have a 10-month advantage in vocabulary, a 6-month advantage in early reading skills, a 12-month advantage in early writing skills, and a 4-month advantage in early math skills (Figures A5 & A7; Mueller, 2008).

In general, results from the two birthday cutoff analyses indicated somewhat stronger advantages of attending PEK for Cohort 1 than for Cohort 2. However, comparing last year's to this year's birthday cutoff results may be misleading. As previously mentioned, incoming PEK cohorts have differed in their baseline test scores. Cohort 1 tended to have higher baseline scores than Cohort 2, which would overestimate the impact of PEK. Conversely, Cohort 2 tended to have lower baseline test scores than Cohort 3, which would underestimate the impact of PEK. Although we adjusted for these differences, they may still have impacted results to some extent (Mueller, 2008). Further, other analyses presented in this report indicate stronger academic results for Cohort 2 than Cohort 1.

Comparisons to other programs

The birthday cutoff method has been used in several studies of state-funded preschool programs around the country to determine program effects on children's test scores when they reached kindergarten. Using these studies, we are able to compare PEK's results with those of state-funded preschool programs in eight other states. Overall, the estimated effect tended to be larger for PEK based on the two birthday cutoff analyses conducted thus far (Figures A5 & A8; Mueller & Gozali-Lee, 2007). However, there are limitations

to these comparisons that should be kept in mind. As previously mentioned, we made adjustments where there were differences in baseline test scores of PEK cohorts being compared, and it is possible that our adjustments did not entirely correct for the impact on results. Other studies' limitations in this area are unknown because baseline assessments were not available for both cohorts. Additionally, the proportion of English Language Learners in our study may account for some of the difference in results, and we will continue to examine the implications of the large ELL population as the study progresses. There could also be other meaningful differences between the programs.

Kindergarten readiness compared to classmates

When they reach kindergarten, former PEK students are also compared to their kindergarten classmates. Some classmates have had prior preschool or child care center experience, and some have not. We compare former PEK students to each of these two classmate comparison groups: those with prior preschool or child care center experience, and those without. Kindergarten readiness compared to classmates is examined using the Peabody and Woodcock-Johnson academic assessments conducted by Wilder Research, as well as the Social Skills Rating System assessments completed by teachers.

Analyses presented here incorporate adjustments for differences among the groups in their demographic characteristics and when in the fall children were tested. It is important to note that former PEK children may also differ from their kindergarten classmates in other important ways. For example, families who apply for PEK may differ in motivation, knowledge, or other important factors from those who do not. In that sense, the birthday cutoff analysis offers advantages. Still, we feel that comparing former PEK students to their kindergarten classmates provides insights into how PEK compares to other experiences children may have before kindergarten.

As explained in the evaluation section, former PEK school students are followed as long as they attend kindergarten in Saint Paul, even if they attend kindergarten at a school other than the 10 PEK schools. The classmate comparison group is defined as kindergarten classmates of former PEK children at the 10 PEK schools.

Cohort 1

Academic assessments

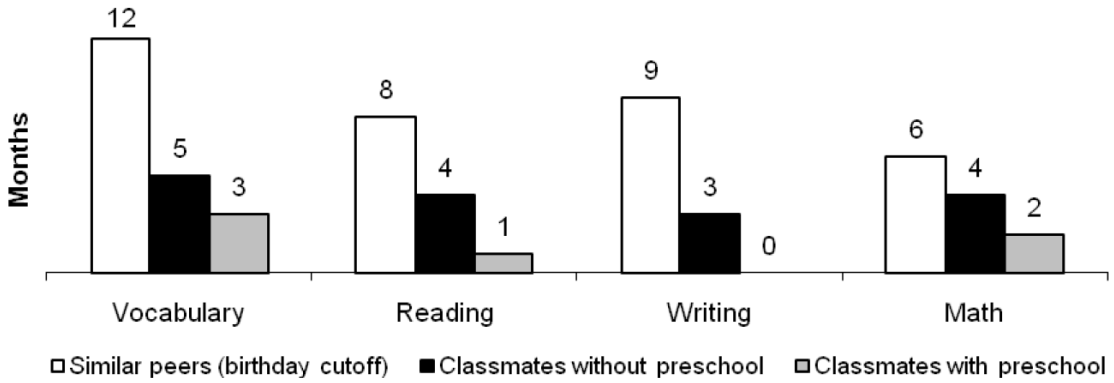
In fall of their kindergarten year, Cohort 1 students scored higher on average in each of the four academic areas than kindergarten classmates who had other preschool or child care center experience. Classmates without prior preschool or child care center experience scored lowest of the three groups on average in each area. Differences between PEK

Cohort 1 children and kindergarten classmates with prior preschool or child care center experience were significant in vocabulary. Differences between Cohort 1 children and classmates without such experience were significant in all four academic areas, including vocabulary, reading, writing, and math (Figure A9). Comparing PEK children to those who did not attend preschool or a child care center, the effect sizes tend to be in or near the medium range (Figure A10). These results suggest that PEK provides benefits beyond those received by most kindergarten children in their pre-kindergarten experiences.

Translating scores into age-equivalency terms, PEK Cohort 1 children had an estimated three-month advantage over their kindergarten classmates with prior preschool or child care center experience in vocabulary, a two-month advantage in math, a one-month advantage in reading, and appeared similar in writing. Again, it should be noted that age-equivalency scores are a less exact measure. Compared to their classmates without prior preschool experience, PEK Cohort 1 children had an estimated five-month advantage in vocabulary, four-month advantage in reading and math, and three-month advantage in writing (Figures 7 and A11).

The following figure shows the advantages of PEK Cohort 1 children in age-equivalency terms compared to the three comparison groups we have discussed: 1) the birthday cutoff comparison group discussed in the previous section, 2) kindergarten classmates without prior preschool or child care center experience, and 3) kindergarten classmates with prior preschool or child care center experience. The higher estimates from the birthday cutoff comparison may in part reflect the higher baseline test scores for Cohort 1 than Cohort 2, which could inflate the results of that comparison even though adjustments were made.

7. PEK school component (fall 2006). Difference in age-equivalency scores in kindergarten: PEK Cohort 1 compared to peer groups



Notes: *This figure presents the differences in months between the average age-equivalency scores of PEK Cohort 1 and its peer groups upon kindergarten entry. Positive numbers indicate that the PEK age-equivalency score was higher by that number of months than the peer group age-equivalency score. In other words, children who attended PEK were estimated to be that many months ahead of children in the peer group upon kindergarten entry on average. All scores are adjusted for demographic and test date differences between the groups being compared.*

Teacher ratings

Using the Social Skills Rating System, teachers rated former PEK children and their kindergarten classmates on their social skills, problem behaviors, and academic competence in fall of their kindergarten year. In the area of social skills, former PEK students received the highest ratings on average, followed by kindergarten classmates with prior preschool or child care center experience, and then by classmates without prior preschool or child care center experience. Differences between PEK children and classmates without prior preschool or child care center experience were statistically significant. The same pattern was seen in teachers' academic competence ratings, with PEK children receiving the highest ratings on average, followed by classmates with prior preschool, and then by classmates without prior preschool. Again, differences between PEK children and classmates without prior preschool or child care center experience were significant. There were no significant differences in problem behaviors, with all three groups exhibiting fewer behavior problems than would be expected based on national norms (Figure A12).

Cohort 2

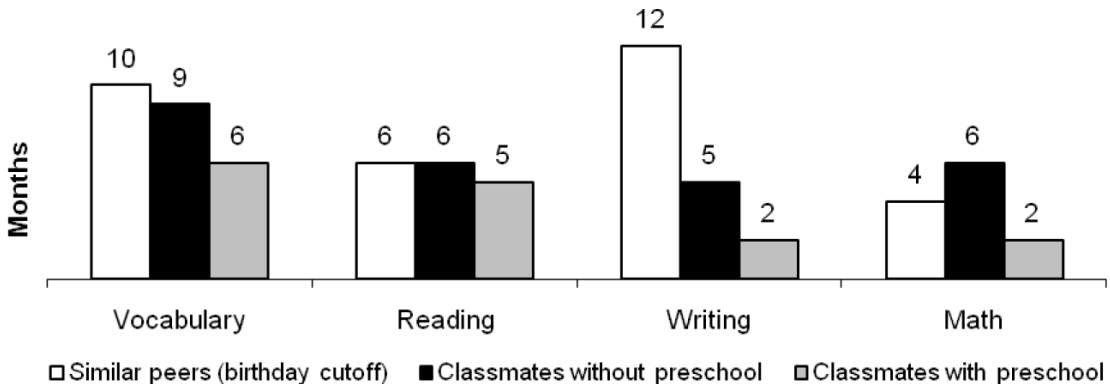
Academic assessments

Fall of kindergarten results indicate that PEK Cohort 2 students have an academic advantage over their classmates, and results were even stronger than those for Cohort 1. In all four academic areas, Cohort 2 children scored higher on average than classmates with prior preschool or child care center experience, followed by classmates without such experience. Differences between former PEK children and both classmate groups were statistically significant in all four academic areas. The effect sizes were stronger for Cohort 2 than Cohort 1, ranging from small to medium for the comparisons between Cohort 2 and classmates with prior preschool experience, and medium to large for the comparisons between Cohort 2 and classmates without prior preschool experience (Figures A13 & A14).

In age-equivalency terms, Cohort 2 students had a six-month advantage over classmates with other preschool or child care center experiences in vocabulary, a five-month advantage in reading, and a two-month advantage in writing and math. Compared to classmates without such experiences, Cohort 2 students had a nine-month advantage in vocabulary, a six-month advantage in reading, a five-month advantage in writing, and a six-month advantage in math (Figure A15).

Figure 8 shows Cohort 2's advantages over all three peer groups in age-equivalency terms, including results from the birthday cutoff analysis and the comparisons to the two kindergarten classmate groups. Comparing this figure to the comparable figure for Cohort 1 (Figure 7) shows the stronger advantages over kindergarten classmates observed for Cohort 2 than Cohort 1. Results of the birthday cutoff analysis do not appear stronger for Cohort 2 than Cohort 1 in general, but again may reflect the impact of differences in baseline test scores.

8. PEK school component (fall 2007). Difference in age-equivalency scores in kindergarten: PEK Cohort 2 compared to peer groups



Notes: *This figure presents the differences in months between the average age-equivalency scores of PEK Cohort 2 and its peer groups upon kindergarten entry. Positive numbers indicate that the PEK age-equivalency score was higher by that number of months than the peer group age-equivalency score. In other words, children who attended PEK were estimated to be that many months ahead of children in the peer group upon kindergarten entry on average. All scores are adjusted for demographic and test date differences between the groups being compared.*

Teacher ratings

Teacher ratings of social skills, problem behaviors, and academic competence also showed stronger results for Cohort 2 than Cohort 1, even though Cohort 1 results were positive and indicated some advantages over classmates. Cohort 2 students had more positive teacher ratings on average in each of the three areas than both classmates with and classmates without prior preschool or child care center experience. In all three areas, differences between Cohort 2 and the two classmate groups were statistically significant (Figure A16). Overall, the results suggest that PEK tended to enhance social skills, lessen problem behaviors, and improve academic competence more than other experiences that their classmates had prior to kindergarten. As previously mentioned, though, it is important to recognize that families who choose PEK may differ from those who do not in ways that impact results.

Differences in first grade compared to classmates

In fall 2007, the first group of PEK students reached first grade. These former PEK participants were compared to their first-grade classmates using the same assessments used in earlier years, the Peabody and Woodcock-Johnson academic assessments and the Social Skills Rating System. As explained in the evaluation methods section, the classmate comparison group consists of PEK children's kindergarten classmates in the 10 PEK schools. After kindergarten, students in both the former PEK group and the classmate comparison group are followed as long as they remain in schools in Saint Paul.

It is important to note that attrition occurs over time. In fall 2007, PEK Cohort 1 children who remained with the study closely resembled the original PEK cohort. However, we found that those who remained in their classmate comparison group were more likely to be English Language Learners than those who we were unable to test in fall of first grade (42% vs. 28%). Probably related, classmates who remained with the study were also more likely than those who did not to have scored slightly lower in vocabulary in fall of kindergarten. Other demographic characteristics and fall of kindergarten test results were similar for those who remained with the classmate comparison group and those who did not. As with fall of kindergarten results, analyses presented here incorporate adjustments for demographic differences among the PEK and classmate comparison groups as well as when in the fall each child was tested.

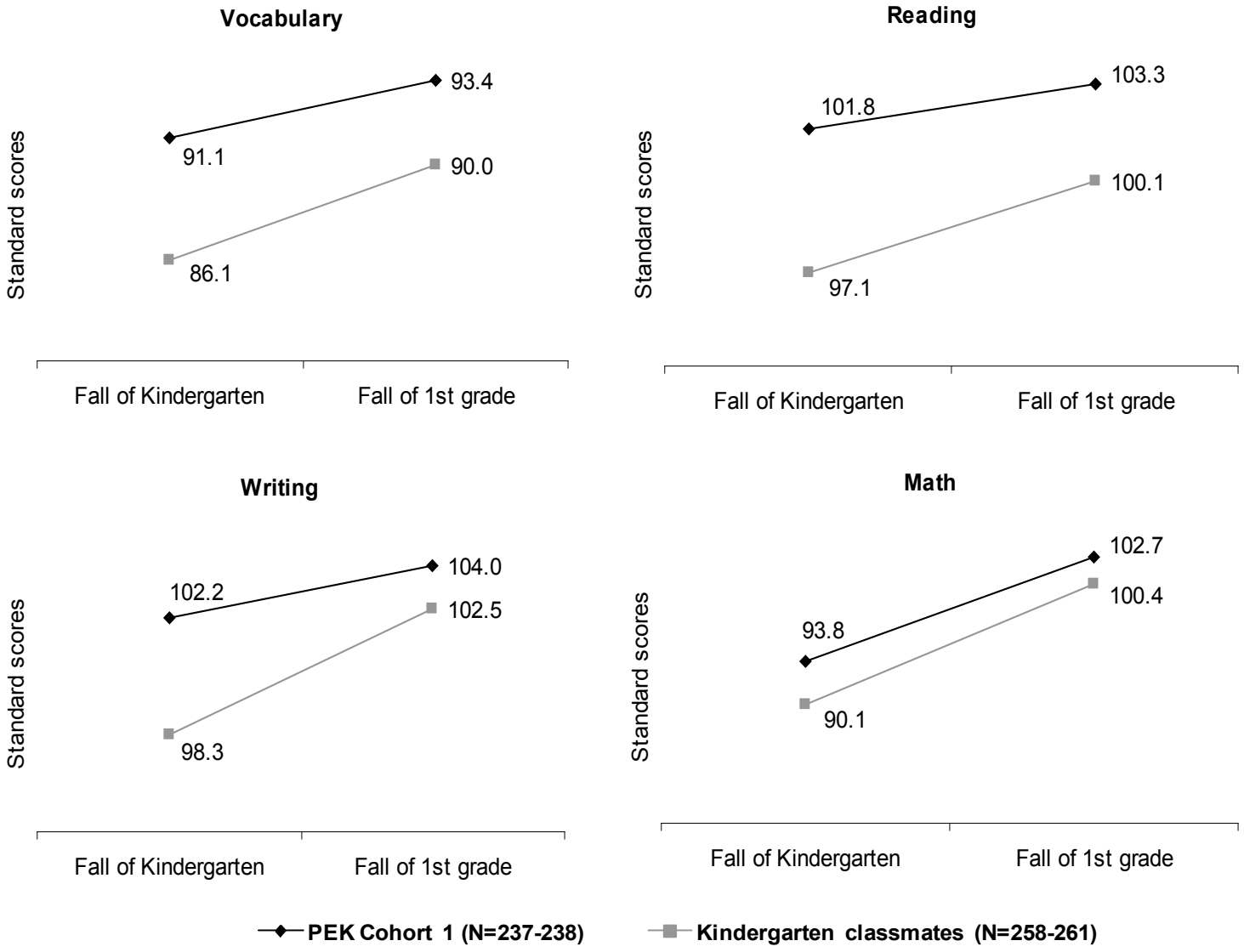
Cohort 1

Academic assessments

Progress between kindergarten and first grade

Between fall of kindergarten and fall of first grade, former PEK students made faster progress than their peers nationally on all four academic assessments, measuring vocabulary and early reading, writing, and math skills. However, their classmate comparison group made even more accelerated progress during the kindergarten year than Cohort 1 on each of the four academic measures. As shown in Figure 9, classmates' larger gains narrowed the gaps that were seen between former PEK students and their classmates in fall of kindergarten. Still, former PEK students continued to score higher on average than their classmates in all four academic areas in fall of first grade (Figure A17). It should be noted that former PEK students' progress was compared to the total classmate comparison group, including both those with and those without prior preschool or child care center experience.

9. PEK school component (fall 2006 to fall 2007). Changes in academic test standard scores from kindergarten to first grade: PEK Cohort 1 vs. kindergarten classmates*



* *The classmate comparison group was defined as kindergarten classmates of former PEK student in the 10 PEK schools. For purposes of this analysis, the kindergarten classmate group includes both classmates with and classmates without prior preschool or child care experience.*

Notes: *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample. These scores are also age-standardized. This means that no change in scores from one year to the next indicates normative progress, positive change indicates accelerated progress, and negative change indicates slower progress in comparison to one's peers. One-year changes in standard scores were statistically significant for each group in each subject (see Figure A17).*

The difference in progress between the two groups can also be viewed in terms of age-equivalency scores. In the fall of kindergarten, the average age-equivalency vocabulary score for PEK Cohort 1 children was 4 years 11 months. It increased to 6 years 1 month in the fall of first grade, for a gain of 14 months. In the classmate comparison group, the comparable age-equivalency scores were 4 years 7 months and 5 years 10 months, representing a 15-month gain during the same time period. Although both groups made faster progress than their peers nationally on each of the measures, the number of months gained is higher for the classmate comparison group for each measure. Both groups made exceptionally fast progress in early math skills in the most recent year (Figure A18).

There may be a couple of reasons why former PEK children progressed less in their kindergarten year than their classmates. One possibility is that in some cases kindergarten instruction did not match the higher skill levels of incoming PEK students. The need for differentiating instruction so that all children can progress to the full extent possible is discussed later in this section. To some extent, demographic differences between the two groups may have also influenced their academic progress. In the fall of first grade, PEK Cohort 1 had a somewhat higher proportion of ELL students than the classmate comparison group (50% vs. 40%), while the comparison group had a higher proportion of low-income students (68% vs. 49%).

PEK's impact in first grade

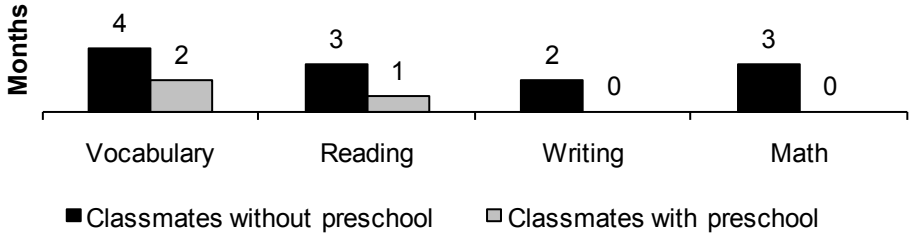
To estimate the potential ongoing impact of PEK, we compared PEK Cohort 1 students' fall of first grade test results with those of students in the classmate comparison group. As was done in kindergarten, we separated the classmate group into those with other preschool or child care center experience prior to kindergarten and those without. Results suggest that the academic advantages that Cohort 1 gained from attending PEK had lessened somewhat from fall of kindergarten to fall of first grade.

In fall of first grade, we continued to see advantages over classmates who did *not* have other preschool or child care center experience prior to kindergarten. Cohort 1 students scored higher on average than this group on three of the four measures. The exception was early math skills (Figure A19). As shown in Figure 10, Cohort 1 students were an estimated four months ahead of these students in vocabulary, three months ahead in reading, and two months ahead in writing. Even though math scores were not significantly different, Cohort 1 students were estimated to be three months ahead in age-equivalency terms, which again is a less exact measure (Figures 10 and A20).

Compared to classmates who *did* have other preschool or child care center experience before kindergarten, PEK Cohort 1 students did not score significantly different on any of the academic measures in fall of first grade. Although differences were not statistically

significant, Cohort 1 students scored higher on average in vocabulary, reading, and math, and lower on average in writing. These results represent a change from the fall of kindergarten when Cohort 1 students had scored higher on average than this group in all four academic areas, with a significant difference in vocabulary (Figure A19).

10. PEK school component (fall 2007). Difference in age-equivalency scores in first grade: PEK Cohort 1 compared to classmates*



* *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

Notes: *This figure presents the differences in months between the age-equivalency scores of PEK Cohort 1 and its classmate comparison group in fall of first grade. Positive numbers indicate that the PEK age-equivalency score was higher by that number of months than the classmate group age-equivalency score. In other words, children who attended PEK were estimated to be that many months ahead of children in the classmate group when they entered first grade. All scores are adjusted for demographic and test date differences between the groups being compared.*

Teacher ratings

PEK children's advantages in social skills also no longer seemed evident in fall of first grade. As previously described, in the fall of kindergarten PEK Cohort 1 students received the highest teacher ratings on average in social skills and academic competence, followed by classmates with other preschool or child care center experiences before kindergarten, and then by classmates without such experiences. Differences between PEK students and classmates without prior preschool were significant at that time. All three groups were similar in their ratings for problem behaviors in fall of kindergarten. A year later, in fall of first grade, Cohort 1 students' advantage in social skills was no longer evident, although the advantage of Cohort 1 students in academic competence compared to students with no preschool or child care center experience continued to be seen. As in kindergarten, there were no differences in problem behaviors across the three groups in fall of first grade (Figure A21).

Implementation efforts

This section explores the extent to which PEK's school component has been implemented as intended. Implementation results provide insights into factors that may have contributed to the changes seen in Cohort 1 and Cohort 2 school participants. This report focuses on the most recent implementation data available, through the end of the 2007-08 school year. It is important to recognize that program implementation has increased over time, however, and therefore was likely more complete for later than earlier cohorts.

Implementation findings presented here are organized into the following topics:

- Alignment with the Project for Academic Excellence
- Language and literacy supports
- Principal, teacher, and parent satisfaction
- Professional development
- School integration
- Teachers' communication with parents
- Parent involvement in children's learning and school activities

Alignment with the Project for Academic Excellence

To determine the extent to which PEK classrooms align with the district's Project for Academic Excellence, an evaluator from Saint Paul Public Schools conducts structured classroom observations each spring based on a tool developed by the evaluator and program coaches. The tool has been modified over time based on increasing levels of implementation and experience working with the tool. In spring 2008, all nine PEK school classrooms were observed based on the assessment tool.[2] The version of the tool used in spring 2008 included a "yes/no" checklist of items associated with 20 indicators of alignment with the Project for Academic Excellence (Figure A22). These indicators relate to the classroom environment, rituals and routines, and the Early Childhood Workshop model.

Due to changes in the observational tool, assessments cannot be directly compared across time periods. Still, results suggest that overall, the program has achieved relatively high

[2] Because World Cultures and American Indian Magnet are two schools that share a building and classroom, there are a total of 9 PEK classrooms across the 10 schools.

levels of alignment all along and has progressed over time. By the end of the third year, all PEK classrooms were fully implementing at least a majority of the indicators.

Early Childhood Workshop model

Based on spring 2008 observations, PEK classrooms have achieved a high rate of implementation of the Early Childhood Workshop model. All nine of the classrooms met indicators related to the following portions of the day: the initial transition into the classroom, community circle time, and small group time. During small group time, teachers were found to have established homogenous groups based on student data. The remaining Early Childhood Workshop indicators addressed the active learning and "regroup to revisit" portions of the day and were met by at least eight of the nine classrooms.

Rituals and routines

PEK classrooms also showed a high rate of implementation for most of the indicators related to classroom rituals and routines. Indicators with a high rate of implementation for each of the checklist items (i.e., at least seven of nine classrooms meeting each item) included the following: use of shared reading, use of interactive writing, incorporation of a read aloud, clear classroom expectations, minimization of downtime, use of accountable talk, and opportunities for independent reading. All nine classrooms also met the basic expectation of having a sign-in routine, but there was room for improvement in the extent to which teachers helped with letter formation and adapted the procedure for individual children's progress. A few classrooms did not have a visual schedule displayed that could be used to provide support for children's self-regulation.

Classroom environment

Classrooms also generally met indicators related to classroom environment, although in some areas there was room for moving beyond the basic expectations. Indicators with a high rate of implementation included displays of children's original work, displays of children's names, and the development and use of a detailed lesson plan. All nine classrooms had also posted PEK core content standards and had an apparent area of study embedded in the day's activities, but there was room for improvement in children's understanding of the standards and ability to identify the area of study. All nine classrooms also had a word wall, but the word wall was not always at eye level or referred to by the teacher or children.

Language and literacy supports

The PEK evaluation also specifically addresses the extent to which classrooms promote literacy and language development. To this end, independent observers conduct assessments each year using a research-based tool for preschool classrooms, the Early Language Literacy

and Classroom Observation (ELLCO). Spring 2008 assessments found that overall, PEK classrooms created a strong "culture of literacy," and the impact of PEK's coaching was evident in teachers' practices. The observer noted that her visits were scheduled in advance, but was very positive in commending the high level of quality PEK environments achieved in the area of language and literacy supports. For example, writing and the alphabet received strong emphasis, and teachers followed program "protocol of repeated reading, community circle, and small groups." The observer advocated that PEK staff "continue the SEEDS training and coaching model that you have been using," noting that "I am convinced you would not be at this level without it" (Passe, 2008).

There was some variation among sites, and site-level scores were provided to program staff to aide in supporting individual locations. The observer also offered some general recommendations. One relates to teachers progressing toward making literacy more "organic" by incorporating it into children's play in addition to more structured activities. Children's play may also be inhibited somewhat by clutter, and teachers may need additional help with sorting toys and materials and choosing the appropriate ones for the theme and learning goals. Another recommendation relates to more explicitly using diversity "to make literacy even more meaningful and to bridge home and school literacy." In addressing cultural diversity, the observer also suggested that to best support vocabulary development, teachers avoid mixing languages (Passe, 2008).

Principal, teacher, and parent satisfaction

Principal satisfaction

In spring 2008 Wilder Research conducted surveys with the 10 PEK school principals. Four principals completed the survey on their own, and six completed the survey as a phone interview with Wilder Research staff. Four of the 10 principals reported that this was the first year that either they or their PEK staff were at the school. Responding to a series of open-ended questions, the principals reported being very satisfied with the PEK program. They appreciated having PEK in their schools. According to the principals, PEK has noticeably improved students' readiness for kindergarten, and has pushed kindergarten classrooms to a higher level. Principals also spoke favorably of the leadership and support provided by PEK staff. Asked what systemic changes the district should make to improve pre-kindergarten programs, PEK principals said that PEK or similar programs should be implemented across the district or state.

Following are examples of principals' comments:

> I want to reiterate … that it is just a phenomenal program. We are so lucky to have it. Our students are so lucky to have it, because if we can catch them at that early age and have everybody reading and writing and at the math level by the time they're in third grade, we're not going to lose those kids in the older grade levels. I think this program is taking huge steps in getting these kids when we need to get them and getting them engaged and keeping them from being tuned out with what is going on in school. This program has been just wonderful! All the principals have been enthused about it. (PEK school principal)
>
> I really like the program. It does help us in terms of kids who are coming to kindergarten who are ready, who understand what school is all about, who know how to get in line and listen to the teacher, take turns. They have learned how to share. They have learned their ABCs and 123s and know how to write their names. This is especially relevant for students who come from families who may not have as much, families who do not have the resources so that their child is not exposed to the things that they need to get ready for kindergarten. And so I would be a very strong champion in terms of having more 4-yr-old programs, such as the one that we have at [my school]. We do have a waiting list, so there are students and families who want to get in. If we can provide those opportunities for these families and students, we would be better off as educators and as a district and community in terms of getting our kids ready for the next level. I really like the PEK program. (PEK school principal)
>
> The PEK program is a very good program. It's a huge difference between the students that have gone through the PEK program and the students who are in kindergarten who have not gone through it. So I would encourage the district or even the state to have these programs, because it does make a difference. It does get students ready for kindergarten. It is strange because now kindergarten has to change pace a little bit and say, 'Hey! We are not the baseline anymore.' It's the 4-yr-old programs that are the baselines. (PEK school principal)
>
> I am very proud of our pre-K program. I believe I have one of the finest teachers if not the finest. The staff work to match this teacher's leadership. The children have made tremendous strides and the fact that our intent to return indicates almost 80 percent – which is up from 67 percent last year – tells me we are doing something that is working well. (PEK school principal)
>
> [The PEK assistant director's] leadership has been outstanding. I love the strong emphasis on staff development and the comprehensive support provided to PEK teachers. (PEK school principal)

While principals voiced support for PEK overall, they also suggested ways the program could be strengthened. For example, a few principals indicated that their PEK students would benefit from expanded ELL services. As quoted below, one principal commented that the district should consider the needs of ELL students in PEK more systematically. Another principal said teachers need more support in identifying, working with, and coordinating efforts for children with special needs. A few principals also mentioned that increasing parent communication, education, and support was a goal for their PEK classrooms. A couple also felt that the school district should be more sensitive to the transportation needs of 4-year-olds, such as by having 4-year-old children ride on their own separate buses or adding aides to current buses.

> There is a need for the district to consider the needs of ELL learners in PEK more systematically. At this point, it is the [school's] responsibility to provide for ELL support. As our budgets shrink and the ELL department is unable to provide staff for such support, we need to have the district assist with resources to provide adequate support that is reflective of the collaboration that we have in K-6. (PEK school principal)
>
> I also think that more needs to be done to identify and coordinate efforts around the planning for special needs [students]. This includes both those arriving with IEPs and those without. Teachers need much more support in this area, especially with behavior intervention. (PEK school principal)
>
> I need to do more with the parent education piece. Increase in parent connections, parent information sessions, and parent resources. We did pretty [well] on that, but we could do better. (PEK school principal)
>
> We also need to address busing concerns. We have very high needs students who have not been successful following the bus guidelines, I believe pre-K students should have an [aide] on each bus both coming and going from school. I would love to see them ride their own separate buses, or at the very least, have the support of a bus [aide] on each bus. (PEK school principal)

Asked specifically about what they would do if they could change some things about PEK in their school, principals most frequently described wanting to expand the program. They described wishing they had the resources to open an additional classroom or wanting a full-day vs. half-day PEK class, for example.

Parent satisfaction

In the spring 2008 parent-teacher conferences, PEK teachers gave Cohort 3 parents a survey addressing their satisfaction with PEK. The survey was developed by Saint Paul Public Schools and was self-administered, with teachers assisting parents as needed.

Surveys were completed by 208 Cohort 3 parents, representing 70 percent of the 296 children in the Cohort 3 study group. Asked whether they were satisfied with the program, all parents responding to the question answered "yes." Asked how they would rate their child's experiences in PEK, 70 percent indicated "excellent," and another 29 percent indicated "very good."

Teacher satisfaction

In spring 2008 Wilder Research asked PEK school teachers to complete a survey about their experiences with the program and their communication with parents. All nine of the eligible teachers completed the survey, including eight who completed the survey on their own and one who completed the survey as a phone interview with Wilder Research staff. Results indicate that teachers' overall experiences with PEK have been positive. All nine teachers strongly agreed that their school better prepares children for kindergarten because of the school's participation in PEK (Figure A23). Further, all nine either somewhat or strongly agreed that participation in PEK professional development has had a large impact on their teaching practices, with most strongly agreeing. All nine also agreed that they have enough resources and support to implement the PEK curriculum and teaching practices, although three only somewhat agreed.

Asked an open-ended question about what have been the most positive aspects of PEK, teachers cited the program's professional development opportunities, the support provided at professional development opportunities and from the program in general, and the noticeable benefits for children. Examples of their comments follow:

> The most positive aspect has been watching how much the kids progress due to that new information. I gain at the training and coaching sessions. (PEK school teacher)
>
> The professional development opportunities that have included the para-professionals in the class. The coaching model. The resources that have been available. When my classroom needed something, PEK was able to provide me with the resources (i.e., new easel, math resources, language resources). The overall support. I don't feel alone in the PEK classroom. There is a network of people that are willing to listen and help you (i.e., director of PEK, coaches, colleagues, assistants, etc.). (PEK school teacher)
>
> The most positive aspects have definitely been the teacher and coach support. I learn a lot from the meetings and it's great to bounce ideas off each other or ask questions. Also, the preschoolers learn an amazing amount from what we are teaching them. I like the schedule of the day and what we are expected to do with them. (PEK school teacher)

Teachers were also asked an open-ended question about what they would change about PEK in their school. A few teachers mentioned concerns with the busing provided for PEK students, such as 4-year-olds riding with older students, 4-year-olds being dropped off at the bus stop without an adult present, and students engaging in disruptive behavior on the bus. A couple of teachers also said they would like either more financial support or more support in working with Special Education students. It may be interesting to note that the teacher indicating more support was needed for students with special needs represents the same school as the principal voicing this concern. Other changes that were mentioned included the following: expanding the program within the school or to other schools; reducing teacher isolation through increased interaction with kindergarten or other PEK teachers; and providing more information about PEK to the rest of the school to minimize jealousy over the amount of resources provided to PEK teachers. Following are examples of teachers' comments:

> I would like to see the busing change. I do not think that 4-year-olds should ride the bus with the rest of the school. Right now, legally, 4-year-olds can get dropped off at their bus stop without adult contact. And I would like to see some sort of parent, guardian, or some adult contact [be] required as part of the busing. Also, with the busing, I think there should be restraint on the bus for students experiencing difficulty, such as seat belts or a car seat – 'difficulty' meaning some sort of disruptive behavior (standing up on the bus, running around on the bus, aggressive behavior with other children, etc.). I would also like to see more money or materials available to teachers regarding areas of study. I end up spending a lot of my own money for month-long themes [such] as creating a doctor play scene, so I end up buying all the [Band-Aids], the lab coat, and everything that goes along with that. We are very encouraged to create these quality environments, but then these are not financially backed up. I would like to see more support for Special Education students and generally disruptive students. And even if they are not yet on an IEP, during the referral process more support should be given. From the point that I make a referral, it takes a long time. During the many months between a referral and the actual implementation of the IEP, I did not receive adequate support and I did not feel that the behavior team respectfully supports teachers. (PEK school teacher)
>
> More money for supplies (i.e., paint, paper, [Play-Doh]). Also early childhood materials get ruined after years of use by children, and it has been very difficult to get new supplies such as puzzles, play food, and manipulatives from the school. (PEK school teacher)

> I would like to be able to meet with the kindergarten team more often during their grade-level meetings. I would like to be able to work with other PEK teachers more often to plan and talk about themes, small group ideas, etc. When you are the only pre-K classroom in the building it can seem lonely. In an ideal world it would be great to add another classroom or have the opportunity to collaborate more often with the PEK teachers from other school buildings! (PEK school teacher)
>
> The discrepancy between the amount of support PEK receives compared to the kindergarten and other primary teachers. It creates some 'jealous' feelings among the rest of the school. It would be nice if the rest of the school fully understood the PEK program and its purpose. Some of the upper grade teachers don't understand the value of the program. (PEK school teacher)

Professional development

As described in the preceding discussion of teachers' satisfaction with PEK, teachers provided very favorable feedback on the program's professional development. They indicated the program's professional development impacted their teaching practices, and cited professional development as one of the most positive aspects of PEK.

School integration

Principals' perceptions

In the spring 2008 principal survey, PEK principals described a number of ways they are working to further the connection between PEK and the rest of the school. Examples included incorporating PEK in the lesson planning and staff meetings for kindergarten and beyond, and including the PEK class in school-wide and district-wide events. Other examples included training teachers from other classes on the PEK program or having PEK and kindergarten teachers observe each other's classrooms. The fall 2008 joint training for PEK and kindergarten teachers was also mentioned as an important step in fostering connections between the grade levels. Principals also described the importance of sharing information and providing support to each other in serving in their role as the instructional leader of PEK at their school. They use the principal meetings, newsletters, and networking associated with PEK to increase their capacity in this area. Examples of their comments follow:

> In terms of school practices, everything from breakfast to lunch to school-wide assemblies, any school events and any other appropriate opportunities, the 4-year-olds participate in [them] fully. Instructionally, the pre-K teacher has participated on the kindergarten Professional Learning Community group, which met for four full days this school year. (PEK school principal)

> I always make sure that the pre-kindergarten classroom, the students, teachers, and parents feel that they are a part of the school, because they *are* a part of the school. Literacy Night, our Family Night. The teacher and the staff are included in all of the meetings that I hold. When the teacher is included in the Professional Learning Community (PLC), [the teacher takes] part in those conversations – how a student is learning, what kind of professional development do we need as teachers – so the pre-kindergarten teacher is a part of that conversation. That is what I would do is to continue to foster that – [making pre-K] part of the rest of the school community. (PEK school principal)
>
> What has been really helpful has been the PEK principal meetings that [meet] on a monthly basis, or every other month. Just the opportunity to share ideas among principals, in terms of attendance, calling home, registration, sharing the curriculum at these principal meetings, and [having] the external resources that come in and share with us their expertise. This has been very helpful. And I am hopeful this will continue in the future. (PEK school principal)

Many PEK principals share a concern about disparities in kindergarten readiness between children who attended PEK and children who did not. Principals noted that it is difficult for kindergarten teachers to determine how to teach the children who have attended PEK alongside those who have not. Principals described the need for differentiated instruction in kindergarten to meet the varying levels of incoming children. Examples of their comments follow:

> The kindergarten teachers are saying, 'How do I differentiate now?' They've never had that before. They have just had kids coming in for the most part in a school that has 90 percent free and reduced meals, [where] they are all starting at about the same level. And you don't start out with, 'What's your ABCs and can you count to 10?' They can't start like that anymore. Now it's, 'Oh, you're reading a book! Let's get a program going for you!' It is a challenge for the teachers. They have to rethink everything for themselves now. (PEK school principal)
>
> At the end of the year I saw a lot more readers and writers, ready and willing to jump into kindergarten. This year, because of that change, it is making kindergarten look at what they need to do differently next year. And to start off right away with reading and writing with the kids. And to look at differentiation – you just can't start the year in kindergarten having everybody on the same plate. You've got these 4-year-olds who are coming in ready to read and write and they are reading and writing. And then some of the others who haven't been through the PEK who are still at a different level, and then people in between. And there has to be more of an emphasis on differentiating and looking at these learning styles of these kids. (PEK school principal)

> You have one extreme that is not ready, has never gone to school. And then you have another group who is very ready (know how to write their names, know their numbers, understand that it is a school environment and you behave in a different way, know how to line up and punch in their lunch number). And that is where the concern is. The gap has widened because of the PEK program. (PEK school principal)
>
> I am very pleased that the district and PEK are helping to build a [professional development] bridge between PEK and kindergarten with training in [September 2008], and I look forward to continued collaboration to address the challenges of differentiated instruction due to increased and accelerated achievement of our PEK children. (PEK school principal)

Teachers' perceptions

The spring 2008 PEK teacher survey also included an open-ended question asking teachers for their ideas for furthering the connection between PEK and kindergarten at their school. Although the degree of collaboration seems to vary somewhat by school, most teachers suggested ways to further the collaboration at their school. Their ideas included more communication, more consistent curricula, mutual observations, and shared training experiences. Examples of their comments follow:

> Meeting with the kindergarten teams in the building weekly. Training kindergarten teachers on differential instruction. (PEK school teacher)
>
> Possible meeting this summer to discuss next year with pre-kindergarten and kindergarten to create scope/sequence. (PEK school teacher)
>
> I think as an individual school, we really have to come together with [curricula]. I am not too sure what it is that the kindergarteners focus on or come expected to know. More team meetings within the school would be helpful. (PEK school teacher)
>
> I would like to see scheduled observations for kindergarten to observe PEK and for PEK to observe kindergarten. I would like to see the PEK coaches working with the kindergarten team as well. (PEK school teacher)

Teachers' communication with parents

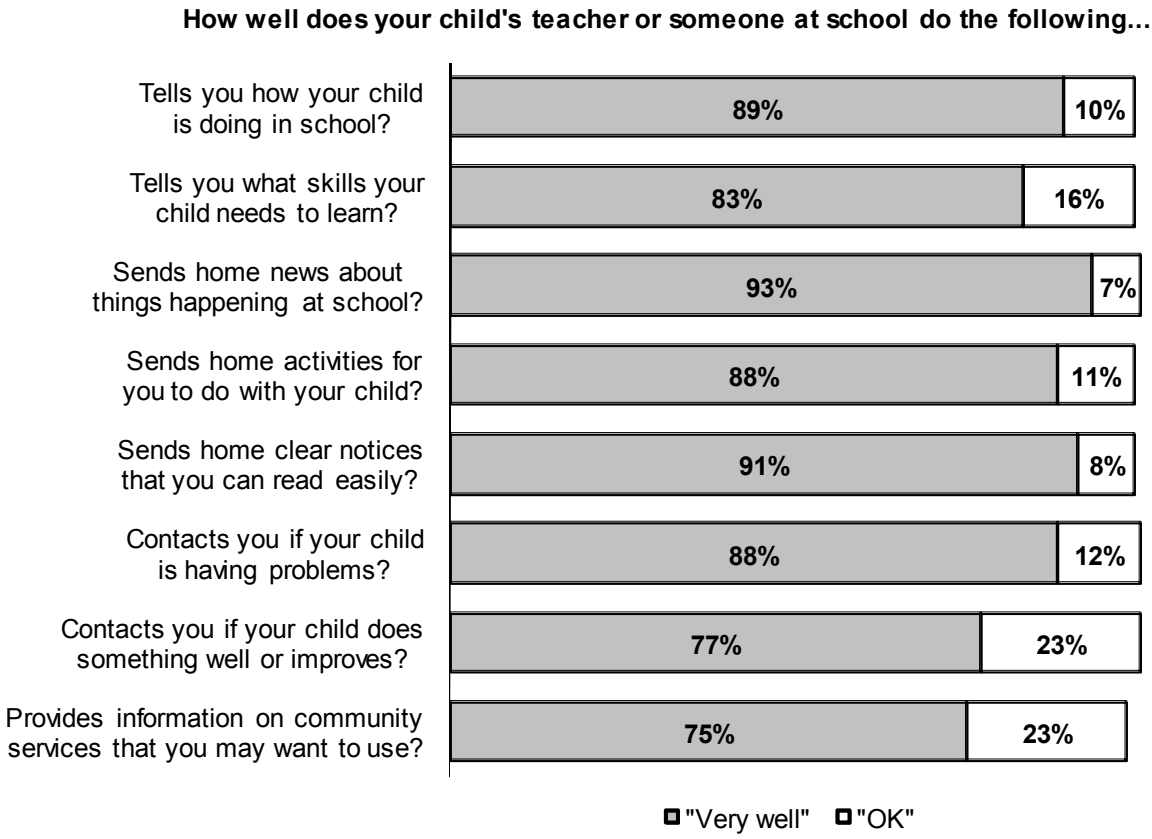
Teachers' perceptions

The spring 2008 PEK teacher survey included several questions about teachers' communication with parents (Figure A24). Responses were mostly favorable, but also suggested that some teachers may perceive room for improvement. Asked to indicate their level of agreement with a statement that there is sufficient communication between the teacher and parents, eight teachers somewhat or strongly agreed and one somewhat disagreed. All nine somewhat or strongly agreed that parents are given information and ideas about how to help their children learn at home. Eight somewhat or strongly agreed and one somewhat disagreed that parents are given information on community services that they may want to use.

Parents' perceptions

The spring 2008 survey of Cohort 3 parents also asked parents for their perceptions of PEK teachers' communication with them. Asked whether they think enough effort is made to involve parents, 96 percent of Cohort 3 parents answered "yes." As shown in Figure 11, survey responses indicate that parents were very satisfied with PEK teachers' communication. Asked how well their child's teacher or someone at school tells them how their child is doing in school, tells them what skills their child needs to learn, sends home news about things happening at school, and sends home activities for them to do with their child, most parents responded "very well." Almost all parents also answered "very well" when asked how well their child's teacher or someone at school sends home clear notices that they can read easily.

11. PEK school component (spring 2008). Cohort 3 parents' perceptions of teachers' communication with them (N=199-208)



Notes: *Teachers administered the survey to PEK Cohort 3 parents during spring parent conferences. Response categories included "very well," "OK," and "poor."*

Parent involvement in children's learning and school activities

Teachers' perceptions

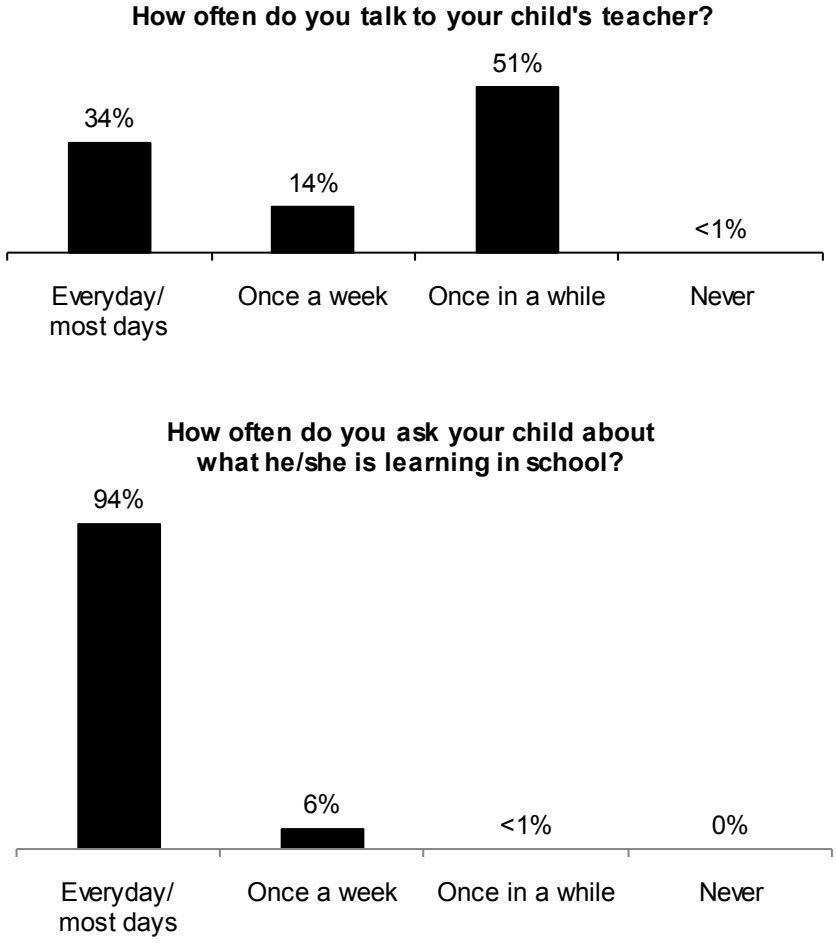
Teachers' responses to the spring 2008 teacher survey indicate they perceive room for improvement in parents' use of information and involvement in the classroom. A majority of teachers only somewhat agreed that parents use the information and ideas about how to help their children learn at home. One teacher somewhat disagreed with the statement, one did not know, and one strongly agreed. Further, a majority of teachers somewhat or strongly *disagreed* that parents frequently observe or volunteer in the classroom (Figure A24).

Teachers' responses indicate that parent participation in conferences was relatively high on average across the schools, but that there is room for improvement at some individual schools. According to teachers, the percentage of their PEK families participating in fall conferences ranged from 80 to 100 percent, with an average of 93 percent. The percentage of PEK families participating in spring conferences ranged from 69 to 100 percent, with an average of 91 percent. Just over half of the PEK teachers (56%) reported that parents' participation in conferences increased between fall and spring, and just under half (44%) reported that it decreased.

Parents' perceptions

The spring 2008 survey of Cohort 3 parents also asked about their involvement in their children's learning. As shown in Figure 12, almost all of these parents reported that they talk to their child about what their child is learning at school. Parents were less likely to report that they frequently talk to their child's teacher. Even though 43 percent reported that they visit their child's school everyday or most days, only 34 percent indicated they talk to their child's teacher everyday or most days. It may not be feasible for parents whose children take the bus to talk to their child's teacher everyday, but taken together these results suggest there may be some room for improvement in this area.

12. PEK school component (spring 2008). Cohort 3 parents' involvement in their child's learning (N=207)



Note: *Teachers administered the survey to PEK Cohort 3 parents during spring parent conferences.*

The survey also asked Cohort 3 parents whether they had attended a variety of activities at their child's school since the beginning of the school year. All parents responding to the question indicated they had attended a parent-teacher conference. A majority had attended open houses, family social or educational events, and student performance programs, and just over a third had attended classes for parents or adults. Smaller proportions had volunteered in their child's classroom and attended parent organization and school committee meetings.

The survey also addressed how frequently parents read to their children. Three-quarters of Cohort 3 parents (73%) reported that they read with their child everyday or most days, and another 21 percent said they do so once a week. This suggests that there may be room for improvement in the frequency with which parents read to their children.

Issues for consideration

A core component of PEK is the inclusion of a rigorous, ongoing evaluation that can be used to inform programming and ultimately assess program results. Based on the findings presented in this report, following are several issues that can be taken into consideration in future planning for PEK school sites. Some of the issues pertain to PEK staff and some pertain to the researchers studying PEK.

- *Assessing impacts as the program matures.* PEK's impact on academic and behavioral skills was found to be larger in the second cohort of school-based children than the first. This suggests that PEK's benefits have increased as it has become more fully implemented, supporting the value of the program model. As the study continues, it will be instructive to see if impacts continue to increase as the program matures further.

- *Differentiating instruction*. The success of PEK in increasing the skills of participants can result in larger skill differences between them and their classmates when they reach kindergarten. At individual schools, these differences pose an instructional challenge for kindergarten teachers. For the program and district, they raise considerations about how to ensure that all children are able to build on their current skills and achieve substantial advances in kindergarten. It is possible that the narrowing of differences that we observed between PEK Cohort 1 children and their classmates from kindergarten to first grade could reflect instruction being targeted to a lower skill level than that of former PEK students.

  District efforts to expand the PEK model to 4-year-old programs district-wide should help address the issue to some extent by increasing the proportion of children who enter Saint Paul schools with similar preparation. Still, there will continue to be diversity in preparatory experiences among children entering kindergarten. This points to the need for kindergarten teachers to differentiate their instruction to the varying skill levels of the children in their class. This is important for PEK children so that they maintain and continue to build on the benefits that PEK provided, and is important for children without a strong academic preparation so they are taught at an appropriate level. Although research on the effectiveness of differentiated instruction is still at an early stage, the principles on which it is based have some grounding in research (Hall, 2002).

  Given the differences in kindergartners' skills that may be due in part to PEK, kindergarten teachers might find additional training and coaching in differentiated instruction helpful. Principals' comments that it is difficult for kindergarten teachers to determine how to teach the former PEK children alongside those who did not participate also suggest that kindergarten teachers may need more training or support. At the time of this report, the district had already begun efforts in this area.

- *Collaboration with kindergarten teachers*. PEK has made a number of strides in fostering linkages between PEK and kindergarten teachers. Such linkages are necessary to ensure children are well prepared for kindergarten, and to ensure their gains in PEK are built on and sustained in subsequent years. Understanding the skills of incoming PEK students may also help kindergarten teachers prepare to differentiate their instruction. Fostering these linkages is an ongoing process, and the program can continue to focus attention in this area. The fall 2008 joint training between PEK and kindergarten teachers is one important milestone, as is the PEK coaching pilot for kindergarten teachers in four schools. Principals' and teachers' enthusiasm for forging these linkages provide a strong basis for continuing to connect PEK teachers with kindergarten teachers and the larger school.

- *Support for English Language Learners*. A few principals indicated that their PEK students would benefit from expanded ELL services. One principal commented that ELL services are strained as school budgets shrink, and suggested that the district consider the needs of ELL students in PEK more systematically. The program may want to consider whether there are ways of providing more targeted support to ELL students in PEK, given budget constraints and competing needs for those services.

- *Young children's transportation needs*. Some PEK school principals and teachers expressed concerns about current busing arrangements. They voiced concern about young children riding with older children, young children being dropped off without an adult present, and insufficient support on the bus to manage younger students. Current arrangements likely reflect budget and bus routing considerations that researchers are not fully aware of. However, because these concerns relate to children's safety, it seems critical that the district find ways to address them.

- *Parent involvement in school activities*. PEK has undertaken a number of strategies to involve parents in their children's learning and in school activities. Still, feedback from teachers and principals suggest they would like to see even more involvement from parents. Some teachers also seem to perceive room for improvement in their communication with parents. Although the program cannot control whether parents act on the information and invitations that are provided, staff should continue their efforts to reach parents and motivate them to become involved. One possibility might be periodically sending home an invitation for parents to stop by the classroom if they are dropping off or picking up their child from school. Even relatively brief interactions with the teacher can help parents gain a sense of their child's school environment and feel more comfortable contacting the teacher when questions or needs arise. This may not be a possibility for all parents, but results suggested that a higher percentage of parents visited the school everyday or most days than talked with the teacher that often.

- *Alignment with the Project for Academic Excellence*. Overall, PEK school classrooms are well-aligned with the Project for Academic Excellence. They have achieved a high level of implementation of the Early Childhood Workshop model and of expected classroom rituals and routines. They have also generally met indicators related to the classroom environment, with room for moving beyond basic expectations in some areas. To continue strengthening alignment with the district's academic reform model, PEK should concentrate efforts in the following areas:
  - *Word walls*. Ensure word walls are displayed at eye level, and help teachers find ways for the teacher and children to refer to the word wall.
  - *Schedule.* Ensure all classrooms display a visual schedule that can be used to provide support for children's self-regulation.
  - *Sign-in*. Help teachers adapt sign-in routines for individual children's progress, and encourage teachers to use this time to teach letter formation.
  - *Area of study*. Help teachers find ways to make the area of study easily identifiable to children.
  - *Standards*. Find age-appropriate ways to explain program standards so that standards are not only posted, but also understood by children.
- *Classroom supplies for teachers*. In the spring 2008 teacher survey, a few teachers only somewhat agreed that they have enough resources and support to implement the PEK curriculum and teaching practices. In their open-ended survey comments, a couple of teachers described needing more or newer materials for the classroom, or money to buy such materials. Classroom supplies are provided by schools, and not PEK. With the understanding that schools face budget constraints, PEK staff can share this information with schools and possibly explore whether there are opportunities to share supplies across classrooms.
- *Language and literacy supports.* Overall, structured observations found that PEK classrooms have created a strong "culture of literacy," and that coaching is evident in teachers' practices. The program continuously strives to promote language and literacy to the full extent possible. As in the past, site-level scores from spring 2008 can be used to target supports in this area. Observations also suggest that coaches can work with teachers to make literacy more "organic" by incorporating it into children's play, and they can help teachers sort toys and materials and choose the most appropriate ones for the theme and learning goals. Coaches can also help teachers more explicitly use diversity in their literacy efforts.

Progress summary: Community-based PEK

This section provides results for the community-based child care portion of PEK. As described earlier, PEK extended the program to Saint Paul child care settings in recognition that parents use a variety of care arrangements for their children. The program considers this component a pilot, with the intent that a community-wide approach will help more children enter school with the skills needed to succeed. Participating sites include child care centers as well as family child care homes.

The first group of providers recruited for the program offered PEK from fall 2006 to spring 2008, although there was considerable turnover among center teachers and home providers during that time. As of spring 2008, 4 child care centers and 13 family child care homes offered PEK. Using what it learned with this initial group of providers, PEK launched the program with a second cohort of providers in fall 2008. As of September 2008, 7 new centers, 1 continuing center, and 13 new homes offer PEK. It should be noted that both child care center teachers and family child care home providers are referred to here as "teachers."

This section begins by profiling children who participated during the program's first two years in child care settings, 2006-07 (Cohort 1) and 2007-08 (Cohort 2). Their progress during PEK is then discussed based on Individual Growth and Development Indicators (IGDIs) administered by PEK staff. Academic and social outcomes based on Wilder Research's assessments are then provided for the first cohort of child care children when they reached kindergarten in fall 2007. When they reached kindergarten, these children were compared to children who had attended PEK at school sites as well as to the same comparison group of kindergarten classmates. After summarizing student results, this section describes the program's implementation in child care settings these first two years. The section concludes with a list of issues for consideration that can be used to inform future planning in the child care component.

Topics addressed in this section include the following:

- Overview of results
- Characteristics of children (Cohorts 1 and 2)
- Progress while in PEK (Cohorts 1 and 2)
- Kindergarten readiness compared to classmates (Cohort 1)
- Implementation efforts (Cohorts 1 and 2)
- Issues for consideration

Overview

Interpreting child care results

In interpreting results for community-based PEK, there are a couple of issues that should be kept in mind. First, it is important to recognize that outcomes available to date for PEK child care children are more suggestive than conclusive. This is in part based on the small size of the PEK child care group. Additionally, there was a rather large difference between the child care group and the comparison groups in the proportion of ELL children. Even though we adjusted for demographic differences among the groups, it is possible that our adjustments did not entirely correct for the impact of these differences.

Results should also be viewed in the context of the teacher turnover that occurred during the first two years. The staff turnover often seen in child care settings has been a challenge for PEK. Participating child care centers experienced high teacher turnover during this time, and two of the original six centers exited the program early. One of these centers experienced a change in management and program direction, and the other was part of a national chain and unable to make requested changes due to corporate guidelines. Additionally, five family child care home providers became ineligible for the program when changes in their enrollment brought them below the program's minimum enrollment requirements. An additional two family child care home providers left the child care field, one lost her child care license, and one chose not to continue on after the first year. When family child care homes exited the program, new providers were asked to take their place for the remainder of the initial cohort.

Key findings

Preliminary results suggest children who participated in PEK's first year at child care sites experienced some advantages over classmates in kindergarten, but did not perform as well as children who attended PEK at school sites. Additional data are needed for researchers to make stronger claims about the child care component's impacts. Over the next few years, we also hope to assess differences in results between home and center sites. On average, findings for 4-year-olds in the first child care cohort were as follows:

- When they reached kindergarten, PEK child care Cohort 1 children appeared to have an advantage over classmates who did not participate in PEK on some academic measures, especially vocabulary.
- However, PEK school-based Cohort 2 children appeared to have a slight advantage over PEK child care children on three of the four academic measures when both groups reached kindergarten.

- In the areas of social skills and problem behaviors, PEK child care Cohort 1 children did not appear to have any advantages compared to kindergarten classmates. Based on teachers' ratings, PEK school children exhibited stronger social skills and fewer problem behaviors. Classmates with other preschool or child care center experiences also exhibited fewer problem behaviors.

- In the area of academic competence, teacher ratings indicated that PEK child care Cohort 1 children had advantages over classmates without prior preschool or child care center experiences, but were not as strong as children who attended PEK at school sites.

Key child care component findings to date also include the following:

- Overall, child care teachers participating in focus groups provided very positive feedback about their experiences with PEK, the helpfulness of PEK's professional development, and the program's impact on children.

- Almost all parents with children entering kindergarten in the fall said their PEK child care teacher helped prepare their child for kindergarten.

- Overall, structured classroom observations found that PEK child care sites were strong in their support for language and literacy.

Characteristics of children

In fall 2006, PEK extended the program to children at participating child care sites in Saint Paul. Figure 13 shows the number of children who participated in the first two cohorts at PEK child care sites. It is important to note that these data reflect all children enrolled in PEK child care during this time, whereas school cohorts are defined as students *tested* in fall of their PEK year. A total of 137 3- and 4-year-old children participated in PEK at child care sites during 2006-07 (Cohort 1), and 114 participated in 2007-08 (Cohort 2). Some of those children did not participate in PEK for the entire year either because of their entry or exit from the child care site or their provider's entry or exit from the program during the year. Child care programs also extend PEK to 2½-year-olds, although those children are not reported on here.

13. Children attending PEK child care sites, 2006-07 and 2007-08

Cohort	3-year-olds	4-year-olds	Total
Cohort 1 (PEK 2006-07)	65	72	137
Cohort 2 (PEK 2007-08)*	59	55	114

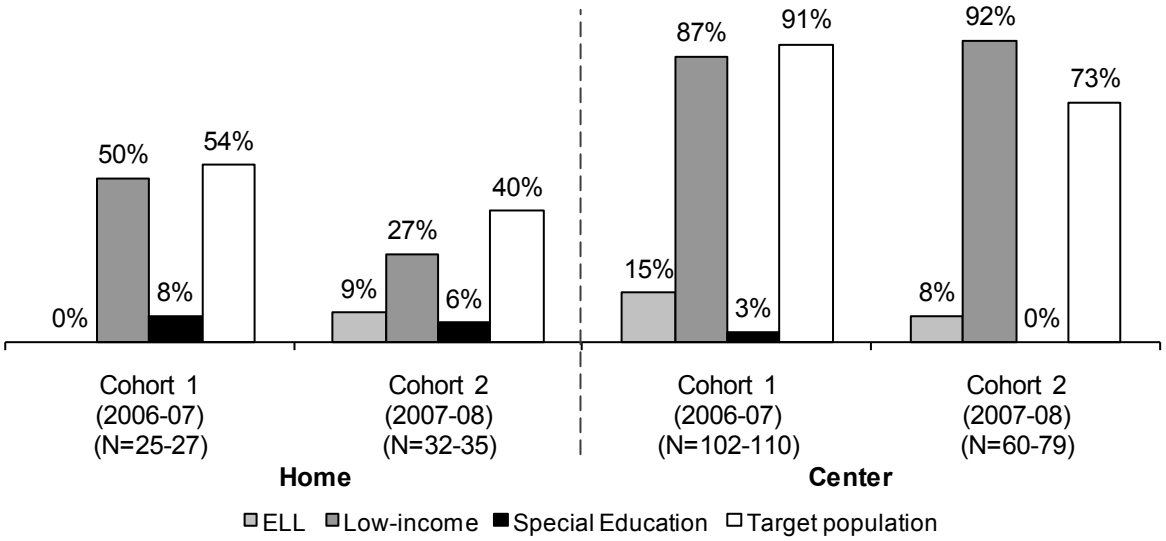
* *Some children who participated in Cohort 1 as 3-year-olds also participated in Cohort 2 as 4-year-olds.*

Note: *Because children in the first two child care cohorts were not assessed by Wilder Research in fall of their PEK year, child care Cohorts 1 and 2 reflect all children attending PEK child care. In contrast, school-based cohorts are defined as PEK students who were assessed in fall of their PEK year. It should also be noted that child care settings extend the program to 2½-year-olds, although those children are not reported on here.*

Demographics

In both family child care homes and child care centers, approximately half of the PEK participants were age 3 and half age 4 during 2006-07 and 2007-08. Across the two years, 40-54 percent of the children in family child care homes and 73-91 percent of the children in child care centers were in the PEK target population, meaning they were English Language Learners, came from low-income families, or needed Special Education services. In both years, higher percentages of center than home care children came from low-income backgrounds (87-92% vs. 27-50%). PEK child care children typically spoke English as their primary home language, including 91 to 100 percent of home care children and 85 to 92 percent of center children across the two years. Two to three children in each setting received Special Education services the first year (3-8%), and two home children (6%) received those services the second year (Figures A25 & A26). Figure 14 shows the percentages of PEK child care children in the program's target populations during the first two years in child care settings.

14. PEK community component. Representation of PEK target populations, 2006-07 and 2007-08



Note: *PEK targets children who are English Language Learners (ELL), from low-income families, or need Special Education services. "Target population" reflects the percentage of children who are in any of these three groups.*

Comparison group demographics

When they reach kindergarten, PEK child care participants are compared to children who participated in the PEK school component as well as children in the school component's comparison group. As in the school component, the comparison group is broken down into those with prior preschool or child care center experience and those without. In fall 2007, we found that PEK child care Cohort 1 differed somewhat demographically from its kindergarten comparison groups, which included PEK school-based Cohort 2 and the Cohort 2 comparison group with preschool experience and the one without it (Figure 5). First, the proportions of ELL children in these three groups of kindergarten classmates (44-53%) were about twice that in child care Cohort 1 (23%). Second, these groups had higher proportions of Asian children (22-38%) than child care Cohort 1 (6%). As with analyses in the school component, in cases where former PEK child care students differed from comparison group students based on demographic characteristics or when in the fall they were tested, we statistically adjusted for those differences in our analysis (see Mueller, 2008).

Changes over time

Also as in the school component, it is possible for child care children's demographic characteristics to change over time. For example, some parents may not initially know

whether their children need Special Education services. As another example, some parents may not initially know that their child is eligible for free or reduced-price lunch, may not apply until their child enters school, or may experience a change in their eligibility.

Changes due to attrition

Following PEK, Wilder Research assesses participants in the community-based portion if they attend kindergarten in Saint Paul. As in the school component, children attending kindergarten outside of Saint Paul are not reflected in the results. In fall 2007, we were able to assess 47 (65%) of the 4-year-olds who had participated in PEK at child care sites during 2006-07 (Cohort 1) and were beginning kindergarten in fall 2007. An additional six child care Cohort 1 children attended kindergarten in Saint Paul, but they had also attended school-based PEK and were placed in the school-based PEK group for purposes of the study (school-based Cohort 2).

Attendance

For children participating in PEK child care Cohort 1, attendance data are available from September 1, 2006, through August 31, 2007 (Figure A27). For child care Cohort 2, attendance data are available for September 1, 2007, through April 30, 2008 (Figure A28). The initial group of child care providers participating in the program ended their contracts with PEK in spring 2008, and complete attendance data were not available for the remainder of the year. It seems likely that many continued to offer aspects of PEK even after their formal contract with the program had ended. As described later in this section in a summary of focus group results, child care providers communicated a desire to continue offering aspects of PEK and remain connected to the program.

The number of days children attended during the first two years varied widely, in part because some of the family child care homes did not participate in PEK during the entire period. From September 2006 through August 2007, 4-year-olds attended an average of 163 days at family child care homes with a range of 111-235 days, and attended an average of 165 days at child care centers with a range of 38-248 days. Eight (14%) of the center children attended 100 or fewer days. Three-year-olds' attendance was slightly higher during that time on average, with an average of 182 days at homes and 168 days at centers (Figure A27).

Again, for Cohort 2 attendance data are available for only September 2007 through April 2008. During these eight months, 4-year-olds attended an average of 134 days at homes with a range of 70-158 days, and an average of 122 days at centers with a range of 20-164 days. Four of these home children (22%) and nine of these center children (24%) attended 100 or fewer days. Three-year-olds attended an average of 125 days at homes and 114 days at centers during this time (Figure A28).

Progress while in PEK

Cohort 1

Teachers' assessments of early language and literacy development

Teachers use Individual Growth and Development Indicators (IGDIs) to monitor individual children's early language and literacy development over time. Preschool IGDIs measure children's progress in three areas: picture naming, alliteration, and rhyming. During the assessments, teachers hold up cards with pictures and ask children to name pictures, identify pictures starting with the same initial sound, and identify pictures that rhyme. The assessments provide teachers with feedback on individual children's progress over time toward developmental outcomes, and alert teachers when additional interventions may be needed (ECRIMGD, 1998; Get It! Got It! Go! website, n.d.). This section summarizes results for 4-year-olds in PEK child care Cohort 1. It should be noted, however, that IGDIs are also administered to 3-year-olds in PEK's community child care component.

During 2006-07, PEK child care staff administered IGDIs three times, in November, March, and July. Results show that on average, 4-year-olds in child care Cohort 1 improved on all three indicators of early language and literacy development.[3] Children experienced the biggest improvement in picture naming. PEK established target scores of 26 for picture naming, 12 for rhyming, and 8 for alliteration for the end of the pre-kindergarten year. Twenty-three percent of 4-year-olds met the program's target score for picture naming at pre-test, and 60 percent at post-test. Rhyming and alliteration experienced smaller increases between the percentages of children meeting targets at pre-test and post-test. Seven percent of 4-year-olds met the target for rhyming at pre-test, and 25 percent at post-test. For alliteration, 7 percent of 4-year-olds met the target at pre-test, and 31 percent at post-test. Smaller percentages meeting the rhyming and alliteration targets may reflect the program offering these lessons later in the year.

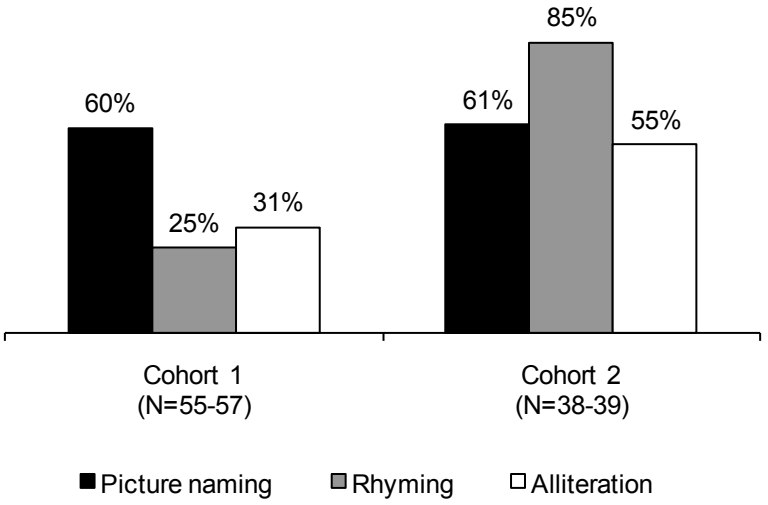
[3] Progress is reported from pre- to post-test. For some Cohort 1 children, the pre-test was in November and the post-test in July, and for others the pre-test was in March and the post-test in July.

Cohort 2

Teachers' assessments of early language and literacy development

PEK child care staff also administered IGDIs three times during 2007-08, in October, January, and April. Results reported here reflect 4-year-olds who took the pre-test in October and post-test in April. Similar to Cohort 1, Cohort 2 children improved on all three indicators. In this case, the biggest improvement was in rhyming. Cohort 2 children generally scored higher than Cohort 1 students at their post-test, despite the fact that their post-test occurred a few months earlier than that of Cohort 1 (Figure 15). However, their scores were also higher than Cohort 1 at pre-test, making their average gain across the three indicators similar to that of Cohort 1 students. Forty-nine percent of Cohort 2 4-year-olds met the program's target for picture naming at pre-test, and 61 percent at post-test. For rhyming, 36 percent of 4-year-olds met the target at pre-test, and 85 percent at post-test. Twenty-four percent of 4-year-olds met the target for alliteration at pre-test and 55 percent at post-test.

15. PEK community component. Percentages of Cohort 1 and Cohort 2 children meeting IGDI targets at post-test, 2006-07 and 2007-08



Kindergarten readiness compared to classmates

Cohort 1

Academic assessments

When they reach kindergarten, children who participated in PEK at child care centers or family child care homes are compared to their kindergarten classmates using the same assessments used in the school component, the Peabody and Woodcock-Johnson academic assessments and the Social Skills Rating System. First, PEK child care participants are compared to the same classmate comparison group as is used in the school component. As in the school component, the classmate comparison group is broken down into those with other preschool or child care center experiences (other than PEK) and those without such experiences. Second, children who attended PEK at child care sites are compared to children who attended PEK at school sites. Again, we adjust for demographic and test date differences among the groups being compared.

In sum, PEK child care Cohort 1 children had an advantage over kindergarten classmates who did not participate in PEK on some academic measures, especially vocabulary. However, PEK school-based Cohort 2 children appeared to have a slight advantage over PEK child care children on three of the four academic measures. Again, these results are more suggestive than conclusive due to the small size of the PEK child care group and differences between this group and the other groups in the proportion of ELL children.

Comparisons to classmate comparison group

When they reached kindergarten, it appeared that PEK child care Cohort 1 had an advantage on some measures compared to kindergarten classmates who did not participate in PEK. The strongest evidence was for vocabulary, where PEK child care children scored significantly higher on average than both classmates with and classmates without prior preschool or child care center experience. In the area of early reading, PEK child care Cohort 1 children scored significantly higher on average than the group without preschool or child care center experience but not the group with such experience. There were no significant differences in early writing and math skills across the groups (Figure A29).

Comparisons to PEK school-based Cohort 2

PEK child care Cohort 1 was also compared to PEK school-based Cohort 2 when both groups reached kindergarten in fall 2007. Children who attended PEK at school sites scored somewhat higher on average in reading, writing, and math, but none of the

differences were statistically significant. Average vocabulary scores were about the same for the two groups (Figure A30).

Teacher ratings

The same types of analysis involving the same groups were conducted for teacher ratings of social skills, problem behaviors, and academic competence when PEK child care Cohort 1 reached kindergarten. Again, we adjusted for differences in student characteristics across the groups.

In sum, PEK child care Cohort 1 did not appear to have any advantages in social skills or problem behaviors when they reached kindergarten. Based on teacher ratings, children who attended PEK at school sites tended to exhibit stronger social skills and fewer problem behaviors. Classmates with other preschool or child care center experiences also appeared to exhibit fewer problem behaviors. Children who attended PEK at schools also appeared to have advantages in academic competence, although children in child care Cohort 1 had advantages in this area over classmates without prior preschool or child care center experience.

Comparisons to classmate comparison group

In the area of academic competence, PEK child care Cohort 1 children were rated significantly higher on average than classmates without prior preschool or child care center experience, but not significantly different from classmates with such experience. No significant differences were found between PEK child care Cohort 1 children and the two classmate groups in social skills. In the area of problem behaviors, PEK child care Cohort 1 children were rated higher (meaning *more* problem behaviors) on average than both classmate groups, and the difference was significant with the group with prior preschool or child care center experience. More detailed analysis involving problem behavior subscales indicated that PEK child care Cohort 1 children tended to exhibit more externalizing problem behaviors and hyperactivity than classmates with other preschool or child care center experiences (Figures A31 & A32).

Comparisons to PEK school-based Cohort 2

As on the academic assessments, children who participated in PEK at school sites appeared to have some advantages over children who participated in PEK at child care sites in their social skills and problem behaviors. In fall of kindergarten, teachers rated school-based Cohort 2 students significantly higher in social skills and significantly lower in problem behaviors than children in child care Cohort 1. More specifically, analysis of the social skills subscales found that school-based Cohort 2 had higher ratings for cooperation and self control. Likewise, analysis of problem behavior subscales indicated that school-

based Cohort 2 had fewer externalizing and hyperactivity problems. No significant difference was found between the two groups in the area of academic competence, although school-based Cohort 2 students were rated somewhat higher on average (Figures A33 & A34).

Implementation efforts

This section explores the extent to which PEK's child care component has been implemented as intended. Implementation results are provided through the end of the program's second year of operation in child care settings, 2007-08. Findings presented here are organized into the following topics:

- Alignment with the Project for Academic Excellence
- Language and literacy supports
- Teacher and director satisfaction
- Professional development
- Implementation of teaching strategies
- Teachers' parent education efforts
- Parent involvement

Alignment with the Project for Academic Excellence

In summer 2008, outside observers completed the second-annual classroom observations assessing PEK child care sites' alignment with the Project for Academic Excellence. The observational tool used in 2008 reflected a few revisions based on second-year professional development priorities. A detailed report on these results was prepared by the University of Minnesota's Center for Early Education and Development (CEED) (Hawley, 2008). A few key findings are summarized here.

Overall, PEK child care sites showed progress in their alignment with the Project for Academic Excellence, according to the CEED report. Based on 2008 observations, most environmental components and routines were implemented to some extent across sites. In general, there was progress from the previous year in the extent to which environments were "literacy rich." There seemed to be room for improvement, however, in the extent to which teachers actively used environmental components throughout the day to promote literacy. In the area of routines, the report found that "teachers were fairly consistent

about putting a particular routine into place but were less consistent in implementing all of the components" (Hawley, 2008).

PEK child care sites attained strong fidelity with the following indicators related to classroom routines: 1) "ease into the day" routines; 2) use of shared reading; 3) use of interactive writing; and 4) routines associated with the "regroup to revisit" portion of the day. A couple of indicators were found to have "mixed fidelity," meaning that "some components were generally high across all settings, some were low." These included the community circle portion of the day, which varied in duration across sites, and "read alouds," which incorporated few open-ended questions. Finally, a few areas of alignment were identified as having "varied fidelity," meaning fidelity was "high in some programs, low in others." Observations found wide variation in practices associated with active learning time, as well as in the extent to which teachers differentiated small groups and the number of children included in small groups. Sites also varied in their use of data for planning, their use of transitions, their interactions with parents, and their intentional use of conversation to promote vocabulary (Hawley, 2008).

Although there were some variations in teachers' use of data for planning, the CEED report notes that teachers valued this information:

> Using progress monitoring was a new concept for most child care teachers. While IGDIs were part of the program in 2007, coaches were more intentional about including teachers in data-based planning during this second year. This process enabled PEK participants to see child growth, meet individual needs, communicate with parents, and build a new level of skills and awareness (Hawley, 2008).

The CEED report also describes child care providers' perceptions of the importance of PEK coaching: "Nearly every participant, when asked 'what makes the biggest difference?' responded with a comment about their relationship with the PEK coach" (Hawley, 2008). Further, the report noted that coaching was intentionally tied to other aspects of professional development:

> PEK's combination of training, coaching, and written resources builds consistency and clear expectations. In 2008, [PEK] used a multi-tiered approach that included clearer goals and congruence throughout professional development strategies and resources. For instance, coaching visits reinforced content that was recently covered in the training sessions. Written resources build a shared reference of definitions, descriptions, and expectations throughout the learning community (Hawley, 2008).

The report describes how the program's coaching has evolved over time based on growth on the part of the program and participating providers:

> In year one, PEK coaches were still figuring out what to expect from child care in comparison to school-based settings. Relationships were new, and professional development was more global in nature about early literacy practices. By 2007-2008, coaches had firm ideas about which interactions to teach, model, and support with resources. The more explicit the expectations for how a routine should be conducted, the higher the implementation fidelity (shared reading and interactive writing are good examples) (Hawley, 2008).

Language and literacy supports

As in the school component, structured observations also assess language and literacy supports in PEK child care settings. The Early Language Literacy and Classroom Observation tool (ELLCO) is used to assess center classrooms, and the similar Child/Home Early Language and Literacy Observation (CHELLO) tool is used in family child care homes. A summary of spring 2008 observations was prepared by an independent consultant of the Saint Paul Public School District (Passe, 2008). Overall, PEK sites were found to be strong in their support for language and literacy. For example, all sites strongly emphasized the alphabet and writing, and incorporated repeated reading, small groups, and community circle time into the day. The consultant noted that visits were scheduled in advance, but commended the program for its intentional emphasis on early literacy and the obvious impact of coaching on teachers' practices. She also described teachers' appreciation for the program's guidance in this area:

> During the interviews, they all referred to the support, direction and resources that they have received from 'PEK,' which seems to have become the code word for 'early literacy.' This was even more explicit from the family childcare providers who are extremely grateful for the program. They praised PEK as an important and enlightening part of their own professional development (Passe, 2008).

While sites were strong in their supports for language and literacy overall, there were also variations among sites. A few areas for improvement were recommended. Most importantly, the consultant noted concerns related to the lack of cleanliness and organization, less than positive environment, and adult-child ratio in a few family child care homes and child care centers. Though not "unsafe reportable situations," the consultant felt there were areas of potential risk. There were also areas where clutter of toys, materials, or books seemed to inhibit children's play during active learning time. In addition, there was room for teachers to make literacy instruction more "organic" by integrating it into children's play. She noted that adults can "serve as play partners and play leaders to stimulate conversation and

higher order thinking skills." Also as noted in the school section, there was room to use cultural diversity more intentionally "to make literacy even more meaningful and to bridge home and school literacy." She recommended avoiding mixing languages (Passe, 2008).

Spring 2008 ELLCO and CHELLO results, as well as changes from baseline and spring 2007 observations, are also discussed in depth in the aforementioned report prepared by the University of Minnesota's Center for Early Education and Development (CEED). Summarizing the ELLCO, CHELLO, and Project for Academic Excellence observations, the CEED report concludes as follows:

> Child care centers have participated in professional development, made changes in their environments, and implemented new teaching strategies and interactions, although turnover continues to challenge growth. Family child care providers have gained knowledge and added many early literacy practices, including environmental print, writing experiences, and components of Early Childhood Workshop in community circle times. While the level of implementation varies, data indicated growth and change, particularly in areas where professional development goals and resources were most explicit (Hawley, 2008).

Teacher and director satisfaction

Overall satisfaction with PEK

In March 2008 Wilder Research facilitated focus groups for child care teachers and child care center directors participating in PEK's child care component. Feedback gathered through the focus groups was intended to inform the program's work with the second cohort of child care providers beginning in fall 2008. At the end of their focus group session, participants were asked to complete a self-administered questionnaire. Participants included 7 of the 10 child care center teachers and assistant teachers with PEK at the time, 11 of the 14 family child care home providers and assistant providers, and 3 of the 6 child care center directors and assistant directors (representing 3 of the 4 centers). A limitation of the focus groups is that a number of the participating teachers had been with PEK for a relatively short period of time and therefore had not been exposed to the program during its full two years of implementation in child care settings. Four of the 7 center teachers and 6 of the 11 participating home providers had been with the program less than a year, although most had been with PEK at least several months.

Key findings and recommendations emerging from the discussions and survey results are described in detail in a separate report available from Wilder Research (Mohr, Gozali-Lee, & Mueller, 2008a). Overall, providers were very positive about their experience with the program and perceptions of the program's effectiveness. Teachers and center directors perceived strong gains in children participating in PEK, and described parents as being

excited about the progress their children were making. Teachers said they were better able to prepare children for school as a result of participating in PEK. Participants also felt the program was well-prepared and its materials were well-organized. They indicated they wanted to continue PEK practices and stay connected to the program even after their formal contract with the program ended. Following are examples of participants' feedback:

> They offer a lot of support to the teachers, encouragement, and then that impacted the children. It's great. It's a wonderful program. (PEK child care center director)
>
> We have the goals, and it teaches us how to teach those. We have our kids learning so fast that they're doing all the stuff they should be doing already so we actually have time to sit down and teach them now how to tie their shoes or how to do other things that they should also know when they go to kindergarten but they might not be getting other places. Because the system is set up so well that they're learning it faster than we thought they would. So we have 5-year-olds who now are at a higher level than some of our 6- and 7-year-olds that are in the school-age room. (PEK child care center teacher)
>
> They've improved like a thousand percent. They know more than some of our school-agers do. They're reading. When we sent the little Tabby Tiger books home with them, the parents you know they're reading the books to the parents. The parents are just floored because their 4-year-old child is reading to them. We have one book that we read all week long. So we start this book on Monday. By Friday they're reading the book to us. That's how fast they're learning this. (PEK child care center teacher)
>
> All my 3-, 4-, and 5-year-olds know all their beginning sounds. I'll say a word and then we'll sound it out and they say what it, you know, the letter is. It just blows my mind that these kids do that. (PEK family child care home provider)

Suggestions for additional supports

Teachers and directors participating in the focus groups also discussed areas where PEK might be able to provide additional support. Key suggestions are summarized here. Additional suggestions that pertain to the program's professional development are summarized in the following section on professional development.

Center teachers indicated they would like more options for themes and activities, and greater integration of PEK and their center's requirements. Center teachers described how in addition to PEK requirements, they also have other requirements from their center, and integrating the two and finding time to accomplish both during a day can be challenging and stressful. PEK's ability to integrate program and center requirements may be somewhat limited, however, because the program works in partnership with and does not

hold direct authority over participating child care centers. Following is an example of a center teacher's comment on this topic:

> I think like when they're doing the program they should just do one [curriculum]. Why not just do *Doors* for [those] whole two years, and not do [the center's] curriculum because we're testing out *Doors?* (PEK child care center teacher)

Family child care home providers indicated they would like additional opportunities to gain ideas from other teachers, and some would like additional adaptations for working in a home environment. PEK has taken a number of steps to accommodate environmental differences across child care settings while maintaining key elements of the program. Still, it seems some family child care home providers continue to struggle with implementing certain aspects of the program in ways that feel compatible with their living environment. Examples of their comments follow:

> Yeah, and I do everything. I have a lot to do in a certain period of time and so it's not making less of the program, but you know, I think you need to be a bit more adapting to how we do run our homes. We're doing daycare in our homes. (PEK family child care home provider)

> That was a challenge for me. Somebody coming in and telling me I had to do this with my house. That was very stressful for me. But once I sat back and looked at it I knew that after seeing different pictures of … the way I could do things, that was a real big learning step for me. To make use of a table in a corner, set something aside specifically for something. You know, I had to learn that. I did not know that. But that was, yeah, that was an obstacle. (PEK family child care home provider)

Professional development

Overall satisfaction with professional development

Overall, teachers and center directors participating in the spring focus groups found PEK's professional development to be very helpful. In the self-administered questionnaires completed at the end of the focus groups, all three center directors in attendance strongly agreed that participation in PEK professional development had a large impact on practices at their child care center. Similarly, all but one child care center teacher strongly agreed that participation in PEK professional development had a large impact on their teaching practices, with the remaining one strongly disagreeing. All responding family child care home providers indicated agreement with the statement, with all but one strongly agreeing and the remaining one somewhat agreeing (Figure A35).

Participants also provided positive feedback about PEK's professional development in the focus group discussions. They commented favorably on both the training and coaching, and indicated they appreciated and were motivated by the goal-setting aspects of the program. Examples of their focus group comments follow:

> I think the coaching was very invaluable because it helped follow-up with what they learned in the training. Because if it was just the training I think a lot of it would get lost by the time it got to the classroom. But I think that helped, the coaching. (PEK child care center director)
>
> When we had some new teachers our coach came twice a week, and I think that really helped a lot. (PEK child care center director)
>
> I don't think [the two-day training] needs to change anything. It basically goes over what you need to know for the kids to go to kindergarten, so it goes over the letters, it goes over the rhyming, it goes over the alliteration. That's basically what it goes over. And it tells you about the books and stuff you need to read. So that's what I like about it. (PEK child care center teacher)
>
> [The SEEDS] trainings for me were amazing. I learned so much from her. I had a lot of ah-ha moments with her. (PEK family child care home provider)
>
> Yeah and then it's almost like you come and – for the next whole month you're just like energetic. I wish I would have had this 10 years ago. I think it would have made [the] path that I had been taking, I think [it] would have – given me more incentive to go on to something [at] a higher level. (PEK family child care home provider)
>
> I think [the coach] just was so in tune with picking up on what our needs were and how things were different for us. (PEK family child care home provider)

Impact of teacher turnover

While their experiences with the program's professional development were positive overall, teachers who started after the program's annual two-day training session initially found it challenging to understand how various program components pieced together. Due to teacher turnover, a number of teachers needed to begin working with the program without having first attended this comprehensive training. In part to address the issue of turnover, PEK formally assigned the new cohort of center directors with the role of the "instructional leader" for their center. Modeled after the Project for Academic Excellence, the instructional leader role involves directors receiving training on PEK so they can support its implementation and train new teachers when they are hired. This training for directors supplements and does not replace the professional development already offered to teachers. Additionally, in fall 2007 PEK provided a child care edition of the program's

implementation manual. Some teachers said that having the "red book" in place now should be helpful to teachers in the future.

Training assistant teachers

In the focus groups, center teachers indicated they would like full inclusion of assistant teachers in the process. PEK has offered its training and training stipends to assistant teachers, but it has not been a requirement. Individual centers have had discretion over whether assistants attend. Participants indicated that assistants help lead teachers and also often do the teaching if the lead teacher is away. They suggested that assistants receive clearer guidance upfront about what their involvement in the program and training is expected to be. More fully including assistants may also help preserve program knowledge in a classroom if the lead teacher leaves.

Separating home from center teachers

Teachers also provided feedback on whether home and center providers should be combined or separated for the monthly training sessions. In 2007-08, the groups were combined every other month. In the spring focus groups, most teachers indicated they would prefer separate monthly training sessions for centers and homes, although a couple of family providers valued having some opportunities to learn from centers as well. Participants discussed how peers who work in a similar environment have similar needs and can therefore relate to each other and share ideas that are helpful to each other.

Implementation of teaching strategies

Another theme that emerged from the spring focus groups was that center teachers and family child care home providers viewed PEK as having positively impacted their teaching and their ability to prepare children for kindergarten. In the self-administered questionnaires completed at the end of the focus group sessions, nearly all child care center teachers and family child care home providers strongly agreed that they better prepare children for school because of their involvement in PEK. All three center directors in attendance also strongly agreed that their center better prepares children for school because of their participation in PEK. Additionally, all family child care home providers and all except one child care center teacher indicated they regularly used the new teaching activities and practices they learned from PEK (Figure A36).

In the focus groups teachers explained that the program provided good ideas for explaining concepts to children, allowed the teachers time to teach additional skills because children learn so fast in the program, provided teachers with more structure or goals, helped teachers change their physical environment to be more conducive to

learning, and gave them tools for talking with parents about children's progress. For example, one teacher commented as follows:

> It's a good jump start on what we need to be teaching the kids, and they give you a lot of good ideas to go on and how to further explain what you're doing and how to get more answers out of the kids by asking them open-ended questions. And it's a lot easier to explain it to the kids with this curriculum, and it's a lot easier for the kids to understand it because they just have everything for you. (PEK child care center teacher)

Teachers' parent education efforts

In March and April 2008 Wilder Research conducted telephone interviews with parents of 3- and 4-year-old children participating in PEK at child care centers and family child care homes. To be interviewed, parents' children had to have been enrolled for at least two months from September 2007 to March 2008. Parents of 66 children participated in the interviews, including 30 children who attended family child care homes and 36 children who attended child care centers. They represented 58 percent of all children attending during 2007-08.

Almost all interviewed parents said they had heard or were familiar with the fact that their provider was working with PEK (97% of parents with children at homes and 92% of parents with children at centers). Parents were also asked whether they had received and used a variety of information. Asked about the "Talk, Read, Write" and "Help Your Child Learn to Read" monthly handouts, most parents of children at family child care homes said they received the information (80-83% for each handout). Somewhat smaller proportions of center parents said they received these handouts (61-69%). For both centers and homes, most parents said they received health information (83% in each group) and information on how to register for kindergarten (75-79%). Somewhat smaller proportions of parents reported receiving information on community resources (53-64%). In each of these cases, parents who received the information typically said they used it. Parents were less likely to receive information on family events at neighborhood schools (39-61%), and to act on that information if they received it.

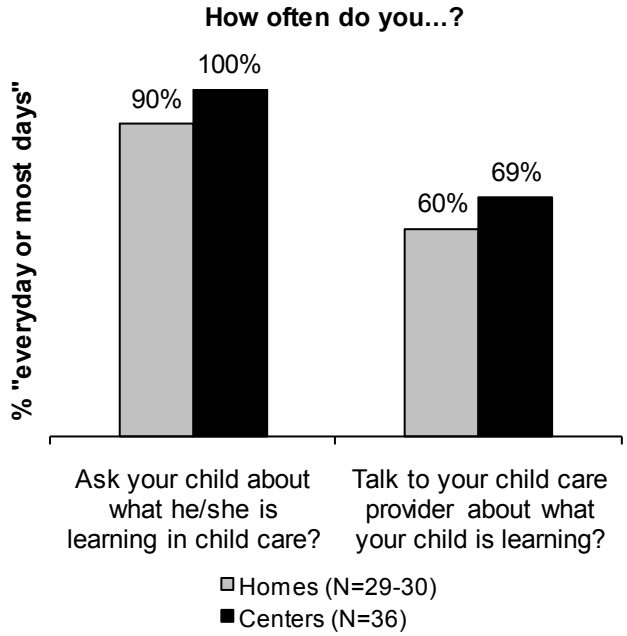
Asked about what community services they would like to know more about, almost all parents (97% of all parents) said they would like information on free or inexpensive places for families with young children to go. Between 30 and 56 percent of all parents said they would like more information on health care for children and families, Coats for Kids, Operation Joy, free tax services, family counseling, and job training for adults.

Parent involvement

The spring 2008 parent interview also included questions about parents' involvement in their children's learning. In general, parents indicated they were involved in their children's learning in a variety of ways, and responses were fairly similar across centers and homes. Almost all parents (94%) reported that they read to or look at books with their child everyday or most days, and the remaining said they do so once a week. Most parents reported that they teach their child new words everyday or most days (82%), and another 8 percent said they do once a week. Asked about their support for their child's writing, most parents said they help their child write letters or words everyday or most days (74%) or once a week (15%), and almost all said they provide their child with writing materials everyday or most days (91%). Asked how frequently they take their child to the library, a majority of parents (59%) indicated once in a while, 23 percent indicated daily or weekly, and the remaining 18 percent said they never do.

Parents were also asked about their communication about what their child is learning in child care. Almost all parents said they ask their child about what their child is learning at child care everyday or most days (90% of home and 100% of center parents). However, smaller proportions said they talk to their child care provider about what their child is learning everyday or most days (60% and 69%, respectively) (Figure 16).

16. Parents' communication about what their children are learning



Parents were also asked whether they would be interested in attending workshops on a variety of topics related to supporting their children's learning. The most popular was Family Fun Nights, with 83 percent of parents saying they were interested. A majority of parents said they were interested in attending workshops on preparing their child for kindergarten (68%), helping children learn to write (64%), and helping children learn to read (59%), as well as workshops providing information about Saint Paul Public Schools (59%). For most parents (88%), evening was the best time for parent workshops.

Parents with children entering kindergarten in the fall were asked questions about their child's preparedness. Almost all (97%) said the child care center or family child care home helped prepare their child for kindergarten. Most said their child was registered for kindergarten (89%), and that their child has had Early Childhood Screening or has a screening scheduled (81%). Rates were fairly similar across centers and homes. Additionally, most parents whose children were registered reported that their child would attend a Saint Paul public school (70%), and that they and their child had visited the school their child would attend (77%).

Issues for consideration

The PEK child care component is at an earlier stage than the school component, having started a year after initial implementation at school sites. Based on the findings presented in this report, following are several issues that can be taken into consideration in the future planning of PEK's child care component. As in the school section, some of the issues pertain to PEK staff and some pertain to the researchers studying PEK.

- *Strengthening the community component based on experiences with Cohort 1.* At this point, Wilder Research results are available for only the first cohort of children participating in the child care component of PEK. These results seem promising in some areas and also suggest that there is room for improvement. PEK staff have reflected on and learned from their initial experiences with implementing PEK in child care centers and family child care homes. For example, findings from the focus groups and surveys conducted with the initial cohort of providers pointed to areas where the program might be strengthened. PEK staff are using what they have learned to make program changes as they begin working with the second cohort of providers. It will be important for the study to examine whether results for children improve due to these changes.

- *Social skills and problem behaviors.* Particular attention may need to be paid to improving the socials skills and reducing the problem behaviors of children participating in PEK child care programs. When they reached kindergarten, PEK child care Cohort 1 children tended to exhibit more externalizing problem behaviors

and hyperactivity than children who attended PEK at school sites and classmates with other preschool or child care center experiences. Children who attended PEK schools also tended to exhibit more cooperation and self-control. Although these differences may in part reflect differences in child and family characteristics among the groups, PEK staff can consider whether child care teachers could benefit from any additional training on how to foster social skills in children. When data on additional children become available in the future, it may also be instructive for researchers to explore whether there are any differences in social skills between children who participated in PEK at home vs. center child care environments, given differences between the two environments in the number of children who are together, the number of same-age peers, and other characteristics.

- *Navigating home vs. center differences.* PEK has worked extensively to cater to the unique needs of home vs. center environments while maintaining program integrity across settings. Curricular and coaching support has been tailored to these providers' differing needs, while supporting the same program content, structure, and goals. At this point, core program supports have been tailored to the two separate environments. Higher-level considerations related to these environmental differences are now beginning to arise. At centers, teachers would like more streamlining between PEK and center requirements. At homes, some providers continue to struggle with implementing certain aspects of the program in ways that feel compatible with their living environment. The challenge for PEK now is to consider which additional environmental accommodations would benefit the program, and at what point accommodations would no longer be feasible or desirable.

- *Parent outreach.* Parents of children at PEK child care sites reported receiving a variety of information from the program, and reported being involved in their child's learning in a number of ways. The program has worked over time to refine and expand its parent outreach efforts. The following suggestions based on feedback from the parent phone interviews may be helpful in this ongoing process:

  - *Parent-teacher communication*. Encourage home and center providers to initiate conversations with parents about what their child is learning in PEK.

  - *Monthly handouts*. Work with centers to ensure parents receive the monthly handouts. Consider asking center teachers to verbally alert parents to the handouts.

  - *Family activities*. Provide parents with additional information on free or inexpensive places for families with young children. One idea is to provide information on library programs, given that a majority of parents said they take their child to the library only once in a while. PEK may also want to consider

adding "Family Fun Nights," since most parents said they would be interested in attending those.

- *Parent workshops*. Consider offering evening parent workshops that provide information on preparing children for kindergarten, helping children learn to write, helping children learn to read, and Saint Paul Public Schools.

- *Kindergarten registration*. Slightly more than three-quarters of parents said they had received information on how to register for kindergarten. By the time of the spring phone interviews, most but not all parents with children entering kindergarten in the fall had registered their child for kindergarten and had taken their child for Early Childhood Screening. In order to reach all parents, PEK may want to provide information on kindergarten registration at multiple times during the year, or offer a workshop on the topic as suggested above.

- *Supporting language and literacy*. With a new cohort of child care providers beginning this fall, findings from the spring 2008 and spring 2007 classroom observations can inform the program's work with those providers. Clearly, creating environments that are strong in their intentional promotion of literacy is a process, and basic expectations will need to be emphasized before higher-level supports can be addressed.

  Based on observations conducted the past two years, we know it will be important to use site-level data to target support to the needs of individual sites. We also know that at the basic level, teachers may need help minimizing clutter and selecting the most appropriate toys and materials to have out. Coaches may also need to work with teachers to address any concerns about environmental cleanliness, the tone of the environment, and the adult-child ratio, although this may be challenging in some cases given that coaches do not hold direct authority over teachers. Once basic components are in place, teachers may need help connecting active learning centers to lesson themes and encouraging children to make use of book and writing areas. At that point, coaches will also be able to work with teachers to expand their repertoire of strategies for promoting oral language development, including during children's playtime. In general, the program may also need to more explicitly address how cultural diversity can be intentionally used in the promotion of language and literacy.

- *Addressing teacher turnover.* PEK has faced extensive turnover among its center teachers and home providers. This turnover reflects a broader system challenge that is beyond the scope of PEK, although it is important for PEK to address the issue to the extent possible. PEK offers extensive professional development, but given the high turnover a number of teachers began without a strong overview of the program. The PEK child care implementation manual introduced in fall 2007 should help in

this area, as should program plans for the new cohort of center directors to serve as the instructional leader at their center. Encouraging center directors to send assistant teachers to PEK training, and providing assistants with clear expectations of their roles in the program upfront, may also help address the classroom knowledge that is lost when a teacher leaves.

- *Understanding PEK's impact at home vs. center sites*. Child care centers and family child care homes differ from each other in important ways. This study has the potential to contribute useful information about whether differences in these environments seem to affect children's outcomes. When the first cohort of PEK child care children reached kindergarten in fall 2007, there were not sufficient data available for researchers to analyze the results of the two groups separately. However, in the future we will be able to combine data from multiple cohorts of child care children to examine the results of children attending home vs. center child care settings.

- *Understanding PEK's impact on parents' choices*. As researchers learn more about the results of various settings offering PEK, it may also be instructive to explore how the availability of PEK affects parents' choices. For example, how many PEK children at school, child care center, and family child care home sites would not otherwise have participated in a preschool program? Do some families with children at home sites choose not to enroll their child in another preschool program because their provider participates in PEK? Answers to these questions can be explored through the addition of questions to the spring parent surveys and interviews, and may yield instructive insights as additional data on the various settings become available.

Lessons learned

The Minnesota Early Learning Foundation (MELF) is in the process of gathering information on the effectiveness of various early childhood education strategies. Ultimately, the foundation intends to make policy recommendations in 2011. The following excerpt from MELF's 2008 annual report articulates these plans:

> MELF's mission is to recommend cost-effective strategies for preparing children to succeed in school. We are aggressively pursuing this mission by compiling a body of knowledge about what works best and most cost-effectively in promoting learning readiness among children of low-income families, and families facing other challenges. We are weighing the effectiveness of various program models, supporting the empowerment of parents, and determining the valid short and longer-term outcomes and indicators. MELF is taking a 'systems look' at the early childhood learning and education field in Minnesota (MELF, 2008, p. 1).

Results from the PEK evaluation will provide valuable information for determining the best and most cost-effective strategies for preparing children for school. In addition to providing information on the effectiveness of the overall PEK model, the evaluation offers insights into what components of the model seem integral and what components may need to be strengthened or may be more discretionary. Ultimately, the PEK evaluation will also incorporate an analysis that provides information on the cost-effectiveness of the overall program.

This section provides a preliminary list of "lessons learned" in the PEK evaluation that may hold policy implications. These include initial lessons about what seems important to the program's success, and what has not worked as well or may be more discretionary. Four years after receiving initial program funding and three years after serving the first group of children, a number of programmatic successes and challenges have been identified. Evaluators will continue modifying and adding to this list as part of the program's ongoing evaluation.

- *School component's effectiveness at promoting kindergarten-readiness*. At this point, there is fairly strong evidence of the effectiveness of the school component in preparing children for kindergarten. Both Cohort 1 and Cohort 2 in the school component showed significant academic and social advantages over their peers when they reached kindergarten. Less is known at this point about the effectiveness of the child care component, or about home vs. center environments within that component.

- *Importance of professional development component*. Similar to the Project for Academic Excellence, PEK emphasizes intensive, ongoing professional development. To date, teacher reports validate the importance of the professional development

component. Teachers have credited the program's professional development with impacting their teaching practices. Within this component, coaching seems to be an important means for ensuring teachers understand and can implement what is learned in training, and for providing accountability for expectations communicated in trainings.

- *Importance of emphasis on early literacy skills*. Based on results available to date, PEK's strong emphasis on early literacy skills seems to be a key program component. When they reached kindergarten, the first two cohorts of PEK school-based children showed advantages in vocabulary and early reading and writing compared to similar children who had chosen but not yet participated in PEK. Structured classroom assessments found that overall, PEK school sites meet standards for promoting language and literacy in the classroom.

- *Importance of administrative buy-in*. The program's integration into schools and expansion across the district have required the support and buy-in of school principals and district administrators. As the "instructional leader" of PEK at their school, principals are involved in classrooms and oversee classrooms' implementation of the program model. The program has recognized a need for similar buy-in at child care centers, and assigned the new cohort of center directors with a comparable role. At the district level, leadership within the Office of Academics has been actively involved in the consolidation of 4-year-old programs under the PEK model. In the larger community, leadership at Resources for Child Caring has championed the program model with child care providers and initiated similar programs with four other school districts.

- *Inclusion of parent involvement component*. At this point, it is difficult to know the relative importance of the parent involvement component to the results we have seen in children. Results indicate that parents are involved in their children's learning in a number of ways and that there also may be room for improvement in some areas. Although it may be difficult to make claims about the parent involvement component based on data currently available from this study, other research validates the inclusion of this component. Research indicates that strong center-based early childhood programs involving parents can impact parenting in ways that affect school readiness (Brooks-Gunn & Markman, 2005).

- *Importance of linkages with early elementary instruction*. Early results from the school component suggest that program strategies need to address the program's implications for early elementary grades. Between kindergarten and first grade, differences between former PEK students and their classmates narrowed on average. Principals described a need for differentiated instruction in kindergarten to meet the varying needs of incoming children, including relatively high skill levels of children who attended PEK. Toward this end, PEK leaders have begun working with schools to

equip kindergarten teachers to differentiate their instruction based on children's incoming skill levels.

- *Questions about program dosage*. Children participating in PEK's school-based program attend half days five days a week. In contrast, PEK's child care component and the PEK-Early Reading First program offer full days of programming. Wilder Research's evaluations of all three may provide a unique opportunity to explore how the number of hours a child attends (i.e., program dosage) seems to affect academic and social outcomes. In the future, results from PEK's child care component may provide insights in this area. Depending on funding, Wilder Research may also consider comparing results of PEK-Early Reading First students with those of PEK students at some point.

- *Gauging program cost-effectiveness*. Ultimately, we intend to provide information on the cost-effectiveness of the PEK program. The intent is that once sufficient data are available, Wilder Research's chief economist will conduct an analysis on the cost-effectiveness of the overall program. This analysis will compare the relative effectiveness of PEK and other similar programs for preschool-age children in relation to their costs.

In addition to preliminary lessons developed by researchers based on evaluation results, program staff have also suggested lessons they perceive as important based on their work with the program:

- *Using data to drive instruction*. PEK teachers use Work Sampling System assessments (in schools) and Individual Growth and Development Indicators (in schools and child care settings) to monitor children's progress over the course of their PEK year. Program staff perceive this progress monitoring as an important tool for differentiating instruction based on individual students' needs. According to program staff, these assessments can also be used to motivate teachers by demonstrating students' progress over time. Evaluation results also suggest that teachers value the data received from these assessments.

- *Establishing high expectations*. Program staff also perceive a key component of the program to be its establishment of clear and high expectations for teachers and students. The program emphasizes academic rigor and the development of critical thinking skills. Program staff perceive teachers' and students' awareness of specific program expectations to be key to the progress they have made.

As previously noted, this list represents a preliminary compilation of lessons learned from the PEK evaluation that may be useful to practitioners and policymakers making decisions about planning and funding early childhood programs. Over the next few years, data gathered through the study will be used to modify and expand this list.

References

Barnett, W. S., Lamy, C., & Jung, K. (2005). *The effects of state prekindergarten programs on young children's school readiness in five states.* The National Institute for Early Education Research, Rutgers University, December.

Brooks-Gunn, J., & Markman, L. (2005, Spring). The contribution of parenting to ethnic and racial gaps in school readiness. *The Future of Children,* 15:1, 139-168.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Early Childhood Research Institute on Measuring Growth and Development (ECRIMGD, 1998). Research and development of individual growth and development indicators for children between birth and age eight (Tech. Rep. No. 4), Minneapolis, MN: Center for Early Education and Development, University of Minnesota. Retrieved September 20, 2008, from http://ggg.umn.edu/techreports/ecri_report4.html

Get It! Got It! Go! website, n.d. Background information and assessment procedures and materials. Retrieved September 20, 2008, from http://ggg.umn.edu/get/procedures_and_materials/index.html

Gormley, W.T., Gayer, T., Phillips, D., & Dawson, B. (2005). The effects of universal pre-K on cognitive development. *Developmental Psychology, 41, 6,* 872-884.

Hall, T. (2002). *Differentiated instruction.* Wakefield, MA: National Center on Accessing the General Curriculum. Retrieved June 2, 2008, from http://www.cast.org/publications/ncac/ncac_diffinstruc.html

Hawley, V. (2008). *Saint Paul Public Schools Project Early Kindergarten child care implementation report*. Minneapolis, MN: Center for Early Education & Development, University of Minnesota.

Heinrichs, M. (2008). *Teachers' assessment of children—Work Sampling assessment.* Internal report. Saint Paul, MN: Office of Research and Development; Department of Research, Evaluation and Accountability; Saint Paul Public Schools.

Minnesota Early Learning Foundation (MELF) (2008). *Minnesota Early Learning Foundation annual report April 2008*. Saint Paul, MN: Minnesota Early Learning Foundation. Retrieved May 5, 2008, from http://www.melf.us

Mohr, C., Gozali-Lee, E., & Mueller, D. (2008a). *Project Early Kindergarten child care partners: March 2008 focus group results.* Saint Paul, MN: Wilder Research. Available on the Wilder Research website at http://www.wilderresearch.org

Mohr, C., Gozali-Lee, E., & Mueller, D. (2008b). *Project Early Kindergarten-Early Reading First: Evaluation report on the first year of a Saint Paul Public Schools initiative.* Saint Paul, MN: Wilder Research. Available on the Wilder Research website at http://www.wilderresearch.org

Mueller, D. (2008). *Project Early Kindergarten student outcomes: Fourth-year evaluation report.* Saint Paul, MN: Wilder Research.

Mueller, D., & Gozali-Lee, E. (2007). *Initial results for Project Early K: 2006-07 report.* Saint Paul, MN: Wilder Research.

Passe, A. (2008). *Summary of ELLCO and CHELLO observations conducted in the spring 2008.* Internal report prepared by independent consultant of Saint Paul Public Schools. Saint Paul, MN.

Resources for Child Caring (n.d.). About us. Retrieved May 2, 2008, from http://www.resourcesforchildcare.org

Saint Paul Public Schools (n.d.). *A comprehensive reform model ensuring high achievement for all students: Saint Paul's Project for Academic Excellence.* Saint Paul, MN: Saint Paul Public Schools. Retrieved May 9, 2008, from http://thecenter.spps.org/sites/1137e325-a981-4515-9273-14618ab0dec0/uploads/PAE-web.pdf

Saint Paul Public Schools (2007b). *Project for Academic Excellence pre-kindergarten implementation: Level two, August 2007.* Program implementation manual. Saint Paul, MN: Saint Paul Public Schools.

Saint Paul Public Schools, Office of Instructional Services (2005). *Saint Paul's Project for Academic Excellence: Implementation summary 2005.* Retrieved May 9, 2008, from http://www.thecenter.spps.org/pae.html

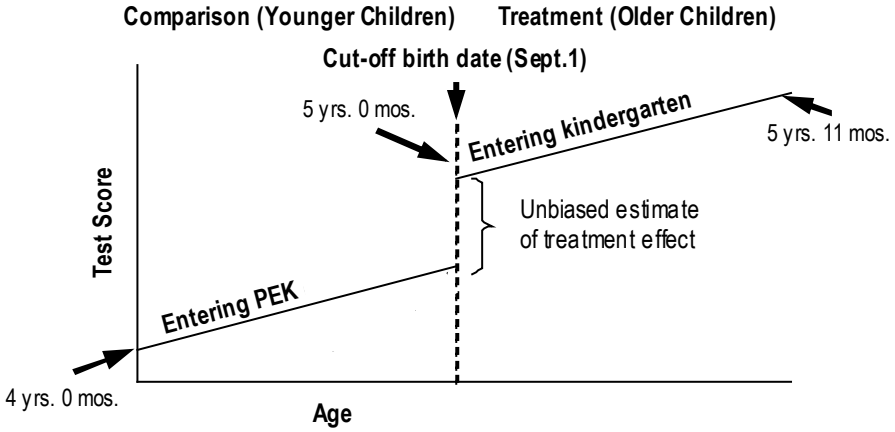
Appendix

School-based PEK

Community-based PEK

School-based PEK

A1. PEK school component. "Birthday cutoff" method illustration, assuming effective treatment



Regression lines:

- Estimated relationship between age and test score for each cohort
- The gap between the lines at the "cut-off birth date" is the estimated treatment effect (impact of PEK)

Note: *The PEK school component uses the "birthday cutoff" method. In this method, treatment and comparison groups are defined by whether a child's fourth birthday falls before or on/after September 1, the birthday cutoff date used to determine eligibility for PEK. For students attending PEK in 2005-06, the treatment group consists of children who enrolled in PEK in fall 2005 and whose fourth birthdays, therefore, fell before September 1, 2005 (Cohort 1). The comparison group consists of children who entered PEK a year later in fall 2006 and whose fourth birthdays fell on/after September 1, 2005, but before September 1, 2006 (Cohort 2). Upon kindergarten entry, the treatment group (Cohort 1 in this case) is compared to the comparison group which is just entering PEK (Cohort 2 in this case). The comparison is carried out using a regression-discontinuity research design in which two regression lines estimating test scores by age are developed, one for the treatment group and one for the comparison group. The regression-discontinuity approach assumes that a child who just made the age cutoff and a child who just missed it have similar characteristics, except that the former child has received the treatment (PEK) while the latter child has not. Given this assumption, the estimated test score difference at the cutoff date should provide an unbiased estimate of the treatment effect (Barnett et al., 2005; Gormley et al., 2005). For students attending PEK in 2006-07, the treatment group consists of Cohort 2 and the comparison group consists of Cohort 3.*

A2. PEK school component. Demographic characteristics of Cohorts 1, 2, and 3 in fall of their PEK year

Characteristics		Cohort 1 (fall 2005) N=325-326	Cohort 2 (fall 2006) N=324-329	Cohort 3 (fall 2007) N=312
Gender	Female	51%	47%	49%
	Male	49%	53%	51%
Race/ethnicity	American Indian	3%	4%	4%
	Asian	27%	24%	30%
	Latino	20%	16%	18%
	Black	31%	39%	33%
	White	19%	17%	15%
Home language	English	50%	55%	52%
	Hmong	24%	20%	22%
	Spanish	17%	13%	13%
	Other	9%	12%	12%
ELL	Yes	49%	45%	48%
	No	51%	55%	52%
Free/reduced-price lunch eligibility	Eligible	61%	74%	71%
	Ineligible[a]	39%	26%	29%
Special Education	Yes	12%	12%	11%
	No	88%	88%	89%
In target population[b]	Yes	79%	88%	87%
	No	21%	12%	13%

[a] *Includes families who were not eligible for free or reduced-price lunch as well as families who did not apply.*

[b] *Child is in one or more of the following categories: eligible for free or reduced-price lunch, ELL, or receives Special Education services.*

Notes: *This figure presents demographic data from fall of the PEK year for children who were assessed at that time. The "Ns" in this figure may differ somewhat from those in other figures in this report and previous reports. One reason is that for purposes of this demographic profile, we included children who were assessed in Spanish and therefore excluded from analyses of results. Another reason is that a few children who were tested were subsequently excluded from results because their birth date did not fall within the range for their cohort based on the program's birthday cutoff date. There could also be some slight differences in "Ns" between this and other figures based on children being assessed with either the Peabody or Woodcock-Johnson, but not both. It is important to note that methods for obtaining PEK children's demographic characteristics changed in 2006 after the district introduced a new application process for 4-year-old programs. It should also be noted that children's demographic characteristics, such as their free- or reduced-price lunch status, can change over time.*

A3. PEK school component (fall 2007). Academic test standard score change for PEK students from fall of PEK to fall of kindergarten: Cohort 1 (fall 2005 to fall 2006) vs. Cohort 2 (fall 2006 to fall 2007)

Test	Number assessed	Mean standard scores[a] PEK (fall 2005)	Kindergarten (fall 2006)	Change[b]
Cohort 1				
Peabody Picture Vocabulary Test III	253	88.1	91.9	+3.8***
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	250	97.5	102.2	+4.7***
Spelling (writing)	251	99.6	102.8	+3.2***
Applied Problems (math)	245	95.1	94.4	-0.7
Cohort 2		**PEK (fall 2006)**	**Kindergarten (fall 2007)**	**Change[b]**
Peabody Picture Vocabulary Test III	266	86.2	92.1	+5.9***
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	263	97.2	103.2	+6.0***
Spelling (writing)	265	94.7	104.1	+9.4***
Applied Problems (math)	251	92.0	95.0	+3.0***

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample. These scores are age-standardized, meaning that no change in scores from one year to the next indicates normative progress, positive change indicates accelerated progress, and negative change indicates slower progress in comparison to one's peers.*

[b] *Fall of kindergarten score minus fall of PEK score.*

*** *p<.001*

A4. PEK school component. Academic test age-equivalency change for PEK students from fall of PEK to fall of kindergarten: Cohort 1 (fall 2005 to fall 2006) vs. Cohort 2 (fall 2006 to fall 2007)

Test	Number assessed	Mean age-equivalency scores (years-months) PEK (fall 2005)	Kindergarten (fall 2006)	Change
Cohort 1				
Peabody Picture Vocabulary Test III	253	3-09	5-00	+15 months
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	250	4-08	5-10	+14 months
Spelling (writing)	251	4-06	5-11	+17 months
Applied Problems (math)	245	4-03	5-03	+12 months
Cohort 2		**PEK (fall 2006)**	**Kindergarten (fall 2007)**	**Change**
Peabody Picture Vocabulary Test III	266	3-06	5-00	+18 months
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	263	4-08	6-00	+16 months
Spelling (writing)	265	4-06	5-11	+17 months
Applied Problems (math)	251	4-03	5-03	+12 months

A5. PEK school component. PEK effect sizes[a] using birthday cutoff method compared to other studies

Assessment instrument	PEK 2005-06[b]	PEK 2006-07[c]	PreK in five states; Barnett et al., 2005	PreK in Tulsa, Oklahoma; Gormley et al., 2005	PreK in Arkansas; Hustedt et al., 2007	PreK in New Mexico; Hustedt et al. 2007	PreK in New Mexico; Hustedt et al. 2008
Peabody Picture Vocabulary Test	.69	.58	.26	-	.36	.36	.25
W-J Letter-Word Identification (reading)	.75	.71	-	.79	-	-	-
W-J Spelling (writing)	.96 (.69[d])	.77 (1.02[e])	-	.64	-	-	-
W-J Applied Problems (math)	.88 (.67[d])	.06[f] (.35[e])	.28	.38	.24	.39	.50

[a] *Small effect = 0.2, medium effect = 0.5, large effect = 0.8. Effect sizes are calculated using Cohen's d (1988).*

[b] *The effect of PEK is based on the comparison between Cohort 1 and Cohort 2 in fall 2006 (see Mueller & Gozali-Lee, 2007).*

[c] *The effect of PEK is based on the comparison between Cohort 2 and Cohort 3 in fall 2007.*

[d] *Effect size adjusted for differences between Cohorts 1 and 2 at baseline (fall of PEK year).*

[e] *Effect size adjusted for differences between Cohorts 2 and 3 at baseline (fall of PEK year).*

[f] *No statistically significant difference at the birthday cutoff.*

Note: *Caution is needed in interpreting Cohort 1 and Cohort 2 results as they may be misleading due to baseline test score differences in the cohorts compared using the birthday cutoff method. These differences at baseline tend to inflate the effect sizes for Cohort 1 and diminish the effect sizes for Cohort 2 for most of the measures. Adjustments have been made to compensate for these differences in some cases (as indicated above) where they were statistically significant. Additionally, it is important to note that PEK effect sizes were calculated based on the standard deviation for the pooled treatment and comparison group, whereas effect sizes in the other studies were calculated based on the standard deviation for the comparison group only.*

A6. PEK school component (fall 2006). Academic test age-equivalency scores[a] at the birthday cutoff point (estimate of the effect of PEK on Cohort 1 students based on birthday cutoff method)

Assessment instrument	Just missed birthday cutoff (Cohort 2)	Just made cutoff (Cohort 1)	Difference
Peabody Picture Vocabulary Test	3 – 09	4 – 09	12 months
W-J Letter-Word Identification (reading)	4 – 11	5 – 07	8 months
W-J Spelling (writing)	4 – 06	5 – 06	12 months (9 months[b])
W-J Applied Problems (math)	4 – 03	5 – 01	10 months (6 months[b])

[a] *In years and months.*

[b] *Adjusted for differences between Cohorts 1 and 2 at baseline (fall of PEK year).*

Note: *The expected age equivalency score is 5 years, 0 months at the birthday cutoff based on national norms.*

A7. PEK school component (fall 2007). Academic test age-equivalency scores[a] at the birthday cutoff point (estimate of the effect of PEK on Cohort 2 students based on birthday cutoff method)

Assessment instrument	Just missed birthday cutoff (Cohort 3)	Just made cutoff (Cohort 2)	Difference
Peabody Picture Vocabulary Test	3-11	4-09	10 months
W-J Letter-Word Identification (reading)	5-01	5-07	6 months
W-J Spelling (writing)	4-09	5-06	9 months (12 months[b])
W-J Applied Problems (math)	4-08	4-11	3 months[c] (4 months[b])

[a] *In years and months.*

[b] *Adjusted for differences between Cohorts 2 and 3 at baseline (fall of PEK year).*

[c] *This difference is not statistically significant based on the regression discontinuity (birthday cutoff) analysis.*

Note: *The expected age equivalency score is 5 years, 0 months at the birthday cutoff based on national norms.*

A8. PEK school component. Studies that use the birthday cutoff method (continues on following page)

A. Program features	PEK 2005-06 and 2006-07	Barnett et al., 2005	Gormley et al., 2005	Hustedt et al., 2007	Hustedt et al., 2007 and 2008
Location(s)	Saint Paul, Minnesota	Michigan, New Jersey, Oklahoma, South Carolina, West Virginia	Tulsa, Oklahoma	Arkansas	New Mexico
Funding	school district funding plus private grant	state-funded	state-funded	state-funded	state-funded
Sites	public schools	public schools and private centers	public schools	public schools and private centers	public schools and private centers
Provider education	All are licensed teachers with four-year college degrees plus preschool certification	Nearly all are teachers with four-year college degrees with an early childhood specialization	All teachers have four-year college degrees plus certification in early childhood education	Nearly all (94%) are teachers with at least a four-year college degree	Lead teachers at each site must have four-year college degrees and certification in early childhood education within 5 years of becoming PreK site. In spring 2006, 71% of lead teachers responding to a survey reported having a bachelor's degree
Length of day	half-day	Varies	Varies	-	-
Teacher[a]/child ratio	1:10	1:8 to 1:10	1:10 or less	-	1:10
Maximum class size	20	15 to 20	20	-	20
Target low-income or at-risk	Yes	Varies	No	Yes	Yes

A8. PEK school component. Studies that use the birthday cutoff method (continued)

B. Characteristics of study samples	PEK Cohorts 1 & 2 2005-06	PEK Cohorts 2 & 3 2006-07	Barnett et al. 2005	Gormley et al. 2005[b]	Hustedt et al. 2007	Hustedt et al. 2007	Hustedt et al. 2008
Sample size							
Treatment	263	268	2,728	1,461	504	382	405
Control	319	296	2,550	1,567	407	504	519
Gender							
Female	49%	48%	52%	48%	48%	49%	54%
Male	51%	52%	48%	52%	52%	51%	46%
Race/ethnicity							
American Indian	4%	4%	3%	9%	<1%	28%	19%
Asian	25%	28%	2%	1%	1%	1%	2%
Latino	15%	15%	21%	14%	6%	56%	57%
Black	36%	36%	25%	39%	36%	1%	2%
White	19%	16%	47%	36%	57%	10%	19%
Other	-	-	-	-	-	2%	<1%
Free/reduced-price lunch							
Eligible	69%	63%	-	66%	-	-	-
Ineligible	31%	37%	-	34%	-	-	-
Age upon PreK entry	4	4	4	4	4	4	4

Note: *Demographic characteristics are provided for the combined treatment and control groups.*

[a] *Includes certified teachers and teaching assistants.*

[b] *Demographic breakdowns for the combined treatment and control groups are approximations calculated from data provided in the published study.*

A9. PEK school component (fall 2006). Academic test standard scores in kindergarten: PEK Cohort 1 vs. kindergarten classmates

Assessment		Cohort 1 (PEK)	Mean standard scores[a] Kindergarten classmates[b] With preschool/ child care center	Mean standard scores[a] Kindergarten classmates[b] Without preschool/ child care center
Peabody Picture Vocabulary Test III	Mean	91.47	87.40	83.60
	Adjusted mean[c]	91.02	86.95**	85.43**
	Number assessed	263	143	99
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	Mean	101.89	98.79	95.23
	Adjusted mean[c]	101.67	99.84	94.29***
	Number assessed	263	142	99
Spelling (writing)	Mean	102.25	99.75	97.89
	Adjusted mean[c]	102.05	101.02	96.59***
	Number assessed	263	143	99
Applied Problems (math)	Mean	93.93	91.45	88.98
	Adjusted mean[c]	93.70	91.88	88.97**
	Number assessed	262	142	98

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Kindergarten classmates were divided into two groups – those who attended preschool, Head Start or a child care center prior to attending kindergarten, and those who did not.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

** *p<.01, compared to Cohort 1 (PEK group).*

*** *p<.001, compared to Cohort 1 (PEK group).*

Notes: *Significance tests were conducted based on a directional hypothesis that former PEK children scored higher than each of the two classmate groups. Wilder Research has also conducted this analysis with an adjustment for mother's educational attainment based on what appears to be some differences among the groups on that characteristic (that analysis did not adjust for child's age). Results were very similar to those presented here, although the difference between Cohort 1 and the classmate group with preschool in Applied Problems was significant. Ns were also lower due to missing data on mother's education. Results reported here reflect the same adjustments as were made for Cohort 2 in kindergarten.*

A10. PEK school component (fall 2006). PEK academic test effect sizes in kindergarten: PEK Cohort 1 students vs. kindergarten classmates

Test	Estimated size of PEK effects[a]: Cohort 1 vs. preschool comparison group	Cohort 1 vs. no preschool comparison group
Peabody Picture Vocabulary Test III	.23	.30
Woodcock-Johnson Tests of Achievement III		
Letter-Word Identification (reading)	.15	.61
Spelling (writing)	.08	.44
Applied Problems (math)	.15	.37

[a] *Effect size was calculated using Cohen's d (1988): the difference between the adjusted means of Cohort 1 and the comparison group divided by the pooled standard deviation of the two groups (using standard scores). Small effect = 0.2, medium effect = 0.5, large effect = 0.8. These results are based on adjustments for demographic (gender, age, race/ethnicity, free/reduced-price lunch eligibility, ELL status, and Special Education status) and test date differences of the groups being compared.*

Note: *Wilder Research has also conducted this analysis for Cohort 1 compared to the combined total classmate group (that analysis did not adjust for child's age). That analysis resulted in an effect size of .27 for vocabulary, .39 for reading, .28 for writing, and .27 for math. Results presented here are consistent with the way Cohort 2 results were analyzed in kindergarten.*

A11. PEK school component (fall 2006). Academic test age-equivalency scores[a] in kindergarten: PEK Cohort 1 students vs. kindergarten classmates

	Mean adjusted[b] age-equivalency scores (years-months)		
		Kindergarten classmates[c]	
Test	Cohort 1 (PEK) (N=262-3)	With preschool/ child care center (N=142-3)	Without preschool/ child care center (N=98-9)
Peabody Picture Vocabulary Test III	4-11	4-08	4-06
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)	5-10	5-09	5-06
Spelling (writing)	5-09	5-09	5-06
Applied Problems (math)	5-03	5-01	4-11

[a] *In years and months.*

[b] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

[c] *Kindergarten classmates were divided into two groups – those who attended preschool, Head Start or a child care center prior to attending kindergarten, and those who did not.*

Note: *Wilder Research has also conducted this analysis for Cohort 1 compared to the combined total classmate group (that analysis did not adjust for child's age). That analysis resulted in an age-equivalent score of 5 years 0 months for Cohort 1 on the Peabody test. Results presented here are consistent with the way Cohort 2 results were analyzed in kindergarten.*

A12. PEK school component (fall 2006). Teachers' ratings in kindergarten: PEK Cohort 1 students vs. kindergarten classmates

Assessment		Cohort 1 (PEK)	Mean standard scores[a] Kindergarten classmates[b] With preschool/ child care center	Mean standard scores[a] Kindergarten classmates[b] Without preschool/ child care center
Social Skills Rating System				
Total Social Skills[d]	Mean	103.60	99.96	101.03
	Adjusted mean[c]	103.61	100.71	99.96*
	Number assessed	235	139	98
Problem Behaviors[e]	Mean	94.64	95.25	94.91
	Adjusted mean[c]	94.68	94.34	96.09
	Number assessed	236	141	100
Academic Competence[f]	Mean	97.14	94.32	88.37
	Adjusted mean[c]	96.62	95.38	88.06***
	Number assessed	221	132	84

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Kindergarten classmates were divided into two groups – those who attended preschool, Head Start or a child care center prior to attending kindergarten, and those who did not.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

[d] *Higher scores indicate higher social skills.*

[e] *Higher scores indicate more problem behaviors.*

[f] *Higher scores indicate higher academic competence.*

* *p<.05, compared to Cohort 1 (PEK group).*

*** *p<.001, compared to Cohort 1 (PEK group)*

Notes: *Wilder Research has also conducted this analysis with an adjustment for mother's educational attainment based on what appears to be some differences among the groups on that characteristic (that analysis did not adjust for child's age). Results were very similar to those reported here, although the difference between Cohort 1 and the classmate group with preschool in Social Skills was significant. Ns were also lower due to missing data on mother's education. Results reported here reflect the same adjustments as were made for Cohort 2 in kindergarten.*

A13. PEK school component (fall 2007). Academic test standard scores in kindergarten: PEK Cohort 2 students vs. kindergarten classmates

Test	Mean standard scores[a]		
		Kindergarten classmates[b]	
	Cohort 2	With preschool/ child care center	Without preschool/ child care center
Peabody Picture Vocabulary Test III			
Mean	92.1	85.7	83.1
Adjusted mean[c]	91.6	86.6**	83.1***
Number assessed	266	139	145
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)			
Mean	103.1	98.0	96.3
Adjusted mean[c]	103.4	98.5***	95.3***
Number assessed	266	139	145
Spelling (writing)			
Mean	104.1	99.9	97.2
Adjusted mean[c]	104.7	100.2**	95.9***
Number assessed	266	139	145
Applied Problems (math)			
Mean	94.5	91.4	87.9
Adjusted mean[c]	94.8	91.8*	87.1***
Number assessed	266	139	140

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Kindergarten classmates were divided into two groups – those who attended preschool, Head Start or a child care center prior to attending kindergarten, and those who did not.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

* *p<.05, compared to Cohort 2 (PEK group).*

** *p<.01, compared to Cohort 2 (PEK group).*

*** *p<.001, compared to Cohort 2 (PEK group).*

Note: *Significance tests were conducted based on a directional hypothesis that former PEK children scored higher than each of the two classmate groups.*

A14. PEK school component (fall 2007). PEK academic test effect sizes in kindergarten: PEK Cohort 2 students vs. kindergarten classmates

Test	Estimated size of PEK effects[a]: Cohort 2 vs. preschool comparison group	Estimated size of PEK effects[a]: Cohort 2 vs. no preschool comparison group
Peabody Picture Vocabulary Test III	.30	.49
Woodcock-Johnson Tests of Achievement III		
Letter-Word Identification (reading)	.49	.77
Spelling (writing)	.36	.73
Applied Problems (math)	.27	.60

[a] *Effect size was calculated using Cohen's d (1988): the difference between the adjusted means of Cohort 2 and the comparison group divided by the pooled standard deviation of the two groups (using standard scores). Small effect = 0.2, medium effect = 0.5, large effect = 0.8. These results are based on adjustments for demographic (gender, age, race/ethnicity, free/reduced-price lunch eligibility, ELL status, and Special Education status) and test date differences of the groups being compared.*

A15. PEK school component (fall 2007). Academic test age-equivalency scores in kindergarten: PEK Cohort 2 students vs. kindergarten classmates

Test	Mean adjusted[a] age-equivalency scores (years-months): Cohort 2 (n=266)	Comparison group[b]: With preschool/ child care center (N=139)	Comparison group[b]: Without preschool/ child care center (N=145)
Peabody Picture Vocabulary Test III	4-11	4-05	4-02
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)	6-00	5-07	5-06
Spelling (writing)	5-11	5-09	5-06
Applied Problems (math)	5-03	5-01	4-09

[a] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

[b] *The comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center prior to attending kindergarten, and those who did not. Children with missing data on preschool/child care experience were included in the no preschool/child care center group.*

A16. PEK school component (fall 2007). Teachers' ratings in kindergarten: PEK Cohort 2 students vs. kindergarten classmates

Assessment		Cohort 2 (PEK)	Mean standard scores[a] Kindergarten classmates[b] With preschool/ child care center	Mean standard scores[a] Kindergarten classmates[b] Without preschool/ child care center
Social Skills Rating System				
Total Social Skills	Mean	106.35	100.39	101.52
	Adjusted mean[c]	106.67	100.79**	100.60**
	Number assessed	238	119	132
Problem Behaviors	Mean	93.62	96.42	95.86
	Adjusted mean[c]	93.25	96.07*	96.85**
	Number assessed	244	129	139
Academic Competence	Mean	97.10	93.79	87.60
	Adjusted mean[c]	97.27	94.48*	86.66***
	Number assessed	242	130	140

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Kindergarten classmates were divided into two groups – those who attended preschool, Head Start or a child care center prior to attending kindergarten, and those who did not.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

* *p<.05, compared to Cohort 2 (PEK group).*

** *p<.01, compared to Cohort 2 (PEK group).*

*** *p<.001, compared to Cohort 2 (PEK group).*

A17. PEK school component. Academic test standard score one-year change, fall 2006 (kindergarten) to fall 2007 (first grade): PEK Cohort 1 vs. kindergarten classmates[a]

Test	Number assessed	Mean standard scores[b] Kindergarten (fall 2006)	1st grade (fall 2007)	Change[c]
Cohort 1				
Peabody Picture Vocabulary Test III	238	91.1	93.4	+2.3**
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	237	101.8	103.3	+1.5*
Spelling (writing)	238	102.2	104.0	+1.8**
Applied Problems (math)	237	93.8	102.7	+8.9***
Kindergarten classmates				
Peabody Picture Vocabulary Test III	261	86.1	90.0	+3.9***
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	259	97.1	100.1	+3.0***
Spelling (writing)	260	98.3	102.5	+4.2***
Applied Problems (math)	258	90.1	100.4	+10.3***

[a] *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

[b] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample. These scores are age-standardized, meaning that no change in scores from one year to the next indicates normative progress, positive change indicates accelerated progress, and negative change indicates slower progress in comparison to one's peers.*

[c] *Fall of first grade score minus fall of kindergarten score.*

* *p<.05*

** *p<.01*

*** *p<.001*

A18. PEK school component. Academic test age equivalency one-year change, fall 2006 (kindergarten) to fall 2007 (first grade): Cohort 1 vs. kindergarten classmates[a]

Test	Number assessed	Mean age-equivalency scores (years-months) Kindergarten (fall 2006)	1st grade (fall 2007)	Change
Cohort 1				
Peabody Picture Vocabulary Test III	238	4-11	6-01	+14 months
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	237	5-10	6-11	+13 months
Spelling (writing)	238	5-09	6-11	+14 months
Applied Problems (math)	237	5-03	6-08	+17 months
Kindergarten classmates				
Peabody Picture Vocabulary Test III	261	4-07	5-10	+15 months
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	259	5-07	6-09	+14 months
Spelling (writing)	260	5-06	6-09	+15 months
Applied Problems (math)	258	4-11	6-08	+21 months

[a] *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

A19. PEK school component (fall 2007). Academic test standard scores in first grade: PEK Cohort 1 students vs. classmates[a]

Test		Mean standard scores[b]		
			Classmate comparison group in 1st grade[c]	
		Cohort 1	With preschool/ child care center	Without preschool/child care center
Peabody Picture Vocabulary Test III	Mean	93.4	91.6	88.7
	Adjusted mean[d]	93.3	91.0	89.3**
	Number assessed	238	121	140
Woodcock-Johnson Tests of Achievement III				
Letter-Word Identification (reading)	Mean	103.2	101.2	98.9
	Adjusted mean[d]	102.8	102.2	98.7**
	Number assessed	238	121	140
Spelling (writing)	Mean	104.0	103.9	101.2
	Adjusted mean[d]	103.7	104.8	100.9*
	Number assessed	238	121	140
Applied Problems (math)	Mean	102.4	100.3	100.0
	Adjusted mean[d]	102.0	101.1	100.0
	Number assessed	238	121	140

[a] *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

[b] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[c] *The classmate comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center prior to attending kindergarten, and those who did not.*

[d] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

* *p<.05, compared to Cohort 1 (PEK group).*

** *p<.01, compared to Cohort 1 (PEK group).*

A20. PEK school component (fall 2007). Academic test age-equivalency scores in first grade: PEK Cohort 1 students vs. classmates[a]

	Mean adjusted[b] age-equivalency scores (years-months)		
		Classmate comparison group in 1st grade[c]	
Test	Cohort 1 (n=238)	With preschool/ child care center (N=121)	Without preschool/ child care center (N=140)
Peabody Picture Vocabulary Test III	6-02	6-00	5-10
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)	6-11	6-10	6-08
Spelling (writing)	6-11	6-11	6-09
Applied Problems (math)	6-08	6-08	6-05

[a] *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

[b] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

[c] *The classmate comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center prior to attending kindergarten, and those who did not.*

A21. PEK school component (fall 2007). Teachers' ratings in first grade: PEK Cohort 1 students vs. classmates[a]

Assessment		Cohort 1 (PEK)	Mean standard scores[b] Classmate comparison group in 1st grade[c] With preschool/ child care center	Without preschool/ child care center
Social Skills Rating System				
Total Social Skills	Mean	99.9	99.2	103.9
	Adjusted mean[d]	99.9	100.1	103.0
	Number assessed	210	108	117
Problem Behaviors	Mean	97.8	98.0	96.6
	Adjusted mean[d]	97.9	96.9	97.4
	Number assessed	211	109	117
Academic Competence	Mean	95.4	93.4	91.5
	Adjusted mean[d]	95.2	93.9	91.4**
	Number assessed	212	107	118

[a] *The classmate comparison group was defined as kindergarten classmates of former PEK students in the 10 PEK schools. After kindergarten, they are followed as long as they remain in schools in Saint Paul.*

[b] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[c] *First-grade classmates were divided into two groups – those who attended preschool, Head Start, or a child care center prior to attending kindergarten, and those who did not.*

[d] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status.*

** *p<.01, compared to Cohort 1 (PEK group).*

A22. PEK school component (spring 2008). Number of classrooms implementing indicators of alignment with the Project for Academic Excellence (N=9)

Classroom environment		Yes	No
Standards posted	a. PEK core content standards posted	9	0
	b. With supporting student work posted	9	0
	c. Children understand the standard*	0	5
Area of study	a. Area of study clearly visible	9	0
	b. Embedded in most parts of the day: community circle, small group, active learning	9	0
	c. Children can identify*	3	4
Children's original work	a. Children's original work is displayed throughout the classroom: pictures, writing, stories, art projects, labels	9	0
	b. Most children have a sample of work posted	9	0
Children's names	a. Children's names are displayed	9	0
	b. Number of places (n = 9, Total = 51, Average = 5.67, Range: 3-8)	-	-
Lesson plan	a. Lesson plan is completed and followed	9	0
	b. Posted or easily assessable	9	0
	c. Detailed to guide daily activities	9	0
	d. Family connection included	7	2
Word wall	a. Horizontal	9	0
	b. Eye level	4	5
	c. Children's names	9	0
	d. Other	7	2
	f. Used by teacher as a reference	6	3
	g. Used by children as a reference	2	7
Rituals and Routines			
Sign-in	a. Sign-in	9	0
	b. Teaching letter formation	6	3
	c. Adapting procedure for individual progress	5	4
Shared reading	a. Shared reading – one observed	9	0
	b. There is explicit teaching of a specific standard or concepts about print	9	0
	c. All children can see	8	1
	d. Evidence of other shared reading around the room	9	0
Interactive writing	a. Teacher models, demonstrates, guides practice of specific writing strategies, engaging all children	8	1
	b. Evidence of child-initiated interactive writing is posted around the room	7	2

A22. PEK school component. Number of classrooms implementing indicators of alignment with the Project for Academic Excellence (N=9) (continued)

Rituals and Routines (continued)		Yes	No
Read aloud	a. One during Community Circle	9	0
	b. There is explicit teaching of literacy concepts (i.e., phonemic awareness, concepts about print, vocabulary, making a connection, prediction, etc.)	9	0
	c. Teacher and students engage in conversation around the book	9	0
	d. One or two teaching points are raised	8	1
Classroom expectations	a. Classroom expectations are clear	9	0
	b. Community Circle	8	1
	c. Active learning time	8	1
	d. Transitions	8	1
	e. Small group	9	0
	f. Other*	3	1
Down time	a. Down time is minimized for students, and time is effectively managed	9	0
Visual schedule	a. A visual schedule is displayed and may be used to provide support for self-regulation*	5	3
Accountable talk	a. Evidence of accountable talk (speech bubbles are posted, and teacher is heard using AT)	9	0
	b. Teacher intentionally creates the norms and skills of AT (listening, taking turns, asking questions, asking children to respond with proof)	9	0
Independent reading	a. Opportunities for independent reading	8	1
Early Childhood Workshop			
Ease into the day	a. Teachers engaged in supportive interactions with children around reading and writing	9	0
Community circle	a. Community circle: greeting, daily message, read aloud, daily lesson	9	0
	b. Duration (n = 9, Total = 228, Average = 25.33 minutes, Range: 20-30 minutes)	-	-
	c. Children have opportunities to talk	9	0
	d. There are opportunities for children to participate in leadership roles	9	0
Small group	a. Small group duration (n = 9, Total = 119, Average = 13.22 minutes, Range: 7-9 minutes)	-	-
	b. Maximum 6 children/1 teacher	9	0
	c. Teachers explicitly teach, observe, scaffold and assess children's knowledge	9	0
	d. Homogeneous groups based on student data	9	0

A22. PEK school component. Number of classrooms implementing indicators of alignment with the Project for Academic Excellence (N=9) (continued)

Early Childhood Workshop (continued)		Yes	No
Active learning	a. Active learning duration (n = 8, Total = 331, Average = 41 minutes, Range: 35-50 minutes)*	-	-
	b. Teacher and assistant move around the room engaging with children in conversational turn taking, asking open-ended questions, and making observation that help children extend learning and encourage critical thinking	8	1
	c. All centers provide opportunities for children to practice "talk, read, write" what was modeled in large or small group	9	0
Regroup to revisit	a. Regroup to revisit – a time is set aside to reflect on the activities of the day	8	1
	b. Children have opportunities to talk	8	0

* *This item was not observed for all nine classrooms.*

Source: *Classroom observations conducted by a Saint Paul Public Schools evaluator, based on a tool developed by the evaluator and program coaches.*

Note: *Because World Cultures/American Indian Magnet are two schools that share a building and classroom, there are a total of 9 PEK classrooms across the 10 schools.*

A23. PEK school component (spring 2008). Teacher experiences with PEK (N=9)

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Don't know
Participation in PEK professional development has had a large impact on my teaching practices.	7	2	-	-	-
I have enough resources and support to implement the PEK curriculum and teaching practices.	6	3	-	-	-
My school better prepares children for kindergarten because of our participation in PEK.	9	-	-	-	-

Note: *Wilder Research administered a survey to PEK school teachers in spring 2008. Eight teachers completed the survey on their own, and one completed the survey as a phone interview with Wilder Research staff.*

A24. PEK school component (spring 2008). Teachers' communication with parents (N=9)

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Don't know
There is sufficient communication between you (teacher) and parents.	5	3	1	-	-
Parents frequently observe or volunteer in your classroom.	1	2	3	3	-
Parents are given information and ideas about how to help their children learn at home.	6	3	-	-	-
Parents use the information and ideas about how to help their children learn at home.	1	6	1	-	1
Parents are given information on community services that they may want to use.	4	4	1	-	-

Note: *Wilder Research administered a survey to PEK school teachers in spring 2008. Eight teachers completed the survey on their own, and one completed the survey as a phone interview with Wilder Research staff.*

A25. PEK community component. Demographic characteristics of PEK community-based Cohort 1 (2006-07)

	Home		Center	
	N	Percent	N	Percent
Age as of September 1, 2006				
3	13	48%	52	47%
4	14	52%	58	53%
Total	27	100%	110	100%
Gender				
Male	15	56%	50	45%
Female	12	44%	60	55%
Total	27	100%	110	100%
Free/reduced-price lunch eligibility				
Eligible	13	50%	90	87%
Ineligible[a]	13	50%	13	13%
Total	26	100%	103	100%
Ethnicity				
American Indian	0	0%	2	2%
Asian	4	15%	7	6%
Latino	1	4%	19	17%
Black	8	31%	58	53%
White	13	50%	21	19%
Bi-racial or Multiracial	0	0%	2	2%
Total	26	100%	109	100%
Home language				
English	27	100%	94	85%
Hmong	0	0%	4	4%
Spanish	0	0%	8	7%
Other	0	0%	4	4%
Total	27	100%	110	100%

A25. PEK community component. Demographic characteristics of PEK community-based Cohort 1 (2006-07) (continued)

	Home		Center	
	N	Percent	N	Percent
Received Special Education services				
Yes	2	8%	3	3%
No	23	92%	99	97%
Total	25	100%	102	100%
In target population[b]				
Yes	14	54%	94	91%
No	12	46%	9	9%
Total	26	100%	103	100%

[a] *Includes families who were not eligible for free or reduced-price lunch as well as families who did not apply.*

[b] *Child is in one or more of the following categories: eligible for free or reduced-price lunch, ELL, or receives Special Education services.*

Notes: *Because children in the first two child care cohorts were not assessed in fall of their PEK year, child care Cohorts 1 and 2 reflect all children attending PEK child care. In contrast, school-based cohorts are defined as PEK students who were assessed in fall of their PEK year.*

A26. PEK community component. Demographic characteristics of PEK community-based Cohort 2 (2007-08)

	Home		Center	
	N	Percent	N	Percent
Age as of September 1, 2007				
3	17	49%	42	53%
4[a]	18	51%	37	47%
Total	35	100%	79	100%
Gender				
Male	17	49%	42	57%
Female	18	51%	32	43%
Total	35	100%	74	100%
Free/reduced-price lunch eligibility				
Eligible	9	27%	56	92%
Ineligible[b]	24	73%	5	8%
Total	33	100%	61	100%
Ethnicity				
American Indian	0	0%	2	3%
Asian	2	6%	4	6%
Latino	7	20%	6	8%
Black	7	20%	47	64%
White	19	54%	14	19%
Total	35	100%	73	100%
Home language				
English	32	91%	67	92%
Hmong	0	0%	3	4%
Spanish	3	9%	3	4%
Total	35	100%	73	100%
Received Special Education services				
Yes	2	6%	0	0%
No	30	94%	60	100%
Total	32	100%	60	100%

A26. PEK community component. Demographic characteristics of PEK community-based Cohort 2 (2007-08) (continued)

	Home		Center	
	N	Percent	N	Percent
In target population[c]				
Yes	14	40%	58	73%
No	21	60%	21	27%
Total	35	100%	79	100%

[a] *One child who was 5 years old as of September 1, 2007, is included in the 4-year-old group.*

[b] *Includes families who were not eligible for free or reduced-price lunch as well as families who did not apply.*

[c] *Child is in one or more of the following categories: eligible for free or reduced-price lunch, ELL, or receives Special Education services.*

Notes: *Because children in the first two child care cohorts were not assessed in fall of their PEK year, child care Cohorts 1 and 2 reflect all children attending PEK child care. In contrast, school-based cohorts are defined as PEK students who were assessed in fall of their PEK year.*

A27. PEK community component. PEK community-based Cohort 1 children's attendance (September 1, 2006, to August 31, 2007)

	Home		Center	
Number of days present	**N**	**Percent**	**N**	**Percent**
Age 3				
Fewer than 60 days	-	-	-	-
60-80	-	-	3	6%
81-100	-	-	6	12%
101-120	-	-	3	6%
121-140	2	15%	4	8%
141-160	1	8%	5	10%
161-180	2	15%	6	12%
181-200	3	23%	7	13%
201-220	4	31%	6	12%
More than 220 days	1	8%	12	23%
Total	13	100%	52	100%
Average	182		168	
Median	184		178	
Range	121-239		65-241	
Age 4				
Fewer than 60 days	-	-	2	3%
60-80	-	-	1	2%
81-100	-	-	5	9%
101-120	1	7%	2	3%
121-140	2	14%	3	5%
141-160	4	29%	11	19%
161-180	3	21%	12	21%
181-200	1	7%	9	16%
201-220	2	14%	4	7%
More than 220 days	1	7%	9	16%
Total	14	100	58	100%
Average	163		165	
Median	161		175	
Range	111-235		38-248	

Note: *The number of days offered by family child care homes varied widely, with some homes not participating in PEK during this entire period. The range was 129 to 252 days between September 1, 2006, and August 31, 2007. For child care centers, it was 250 to 253 days.*

A28. PEK community component. PEK community-based Cohort 2 children's attendance (September 1, 2007, to April 30, 2008)

	Home		Center	
Number of days present	**N**	**Percent**	**N**	**Percent**
Age 3				
Fewer than 60 days	2	12%	3	7%
60-80	-	-	6	14%
81-100	2	12%	11	26%
101-120	1	6%	2	5%
121-140	3	18%	3	7%
141-160	9	53%	12	29%
161-180	-	-	5	12%
181-200	-	-	-	-
201-220	-	-	-	-
More than 220 days	-	-	-	-
Total	17	100%	42	100%
Average	125		114	
Median	141		116	
Range	40-159		37-165	
Age 4				
Fewer than 60 days	-	-	4	11%
60-80	2	11%	4	11%
81-100	2	11%	1	3%
101-120	-	-	4	11%
121-140	3	17%	5	14%
141-160	11	61%	17	46%
161-180	-	-	2	5%
181-200	-	-	-	-
201-220	-	-	-	-
More than 220 days	-	-	-	-
Total	18	100%	37	100%
Average	134		122	
Median	151		144	
Range	70-158		20-164	

Notes: *In 2007-08, attendance was recorded for both centers and homes from September through April. Some of the family child care programs did not offer PEK during this entire period, however. The number of months offered by family child care homes ranged from six to eight months during this period.*

A29. PEK community component (fall 2007). Achievement test standard scores in kindergarten: PEK community-based Cohort 1 vs. kindergarten classmates with preschool (not PEK) and without preschool

Test	Standard score[a]		
		Kindergarten classmates[b]	
	PEK community-based (child care) Cohort 1	With preschool/ child care center (not PEK)	Without preschool/ child care center
Peabody Picture Vocabulary Test III			
Mean	97.4	85.7	83.1
Adjusted mean[c]	93.0	87.1*	83.2**
Number assessed	47	139	145
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)			
Mean	102.0	98.0	96.3
Adjusted mean[c]	101.3	98.9	95.7*
Number assessed	47	139	145
Spelling (writing)			
Mean	103.0	99.9	97.2
Adjusted mean[c]	99.5	101.0	97.2
Number assessed	47	139	145
Applied Problems (math)			
Mean	96.0	91.4	87.9
Adjusted mean[c]	92.8	92.7	87.7
Number assessed	47	139	140

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Upon kindergarten entry, PEK community-based Cohort 1 children were compared to PEK school-based Cohort 2 (Figure A30) as well as the PEK school-based Cohort 2 comparison group (presented here). The comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center (other than PEK) prior to attending kindergarten, and those who did not. Children with missing data on preschool/child care experience were included in the no preschool/child care center group.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences among the groups being compared.*

* *p<.05, compared to community-based Cohort 1.*

** *p<.01, compared to community-based Cohort 1.*

A30. PEK community component (fall 2007). Achievement test standard scores in kindergarten: PEK community-based Cohort 1 vs. PEK school-based Cohort 2

Test		Standard score[a] PEK community-based (child care) Cohort 1	PEK school-based Cohort 2
Peabody Picture Vocabulary Test III			
	Mean	97.4	92.1
	Adjusted mean[b]	92.7	92.9
	Number assessed	47	266
Woodcock-Johnson Tests of Achievement III			
Letter-Word Identification (reading)			
	Mean	102.0	103.1
	Adjusted mean[b]	100.4	103.4
	Number assessed	47	266
Spelling (writing)			
	Mean	103.0	104.1
	Adjusted mean[b]	100.9	104.5
	Number assessed	47	266
Applied Problems (math)			
	Mean	96.0	94.5
	Adjusted mean[b]	92.8	95.1
	Number assessed	47	266

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, Special Education status, and test date differences between the groups being compared.*

Note: *There were no statistically significant differences in adjusted mean test scores between the two groups.*

A31. PEK community component (fall 2007). Teacher ratings of social skills, problem behaviors, and academic competence in kindergarten: PEK community-based Cohort 1 vs. kindergarten classmates

Assessment		PEK community-based (child care) Cohort 1	Standard score[a] Kindergarten classmates[b] With preschool/ child care center (not PEK)	Standard score[a] Kindergarten classmates[b] Without preschool/ child care center
Social Skills Rating System				
Total Social Skills	Mean	98.4	100.4	101.5
	Adjusted mean[c]	99.3	101.2	100.6
	Number assessed	38	119	132
Problem Behaviors	Mean	103.3	96.4	95.9
	Adjusted mean[c]	101.4	95.7*	97.0
	Number assessed	38	129	139
Academic Competence	Mean	93.7	93.8	87.6
	Adjusted mean[c]	93.9	94.5	86.8**
	Number assessed	38	130	140

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Upon kindergarten entry, PEK community-based Cohort 1 children were compared to PEK school-based Cohort 2 (Figure A33) as well as the PEK school-based Cohort 2 comparison group (presented here). The comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center (other than PEK) prior to attending kindergarten, and those who did not. Children with missing data on preschool/child care experience were included in the no preschool/child care center group.*

[c] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

* *p<.05, compared to community-based Cohort 1.*

** *p<.01, compared to community-based Cohort 1.*

A32. PEK community component (fall 2007). Teacher ratings of social skills and problem behaviors in kindergarten: Subscale results for PEK community-based Cohort 1 vs. kindergarten classmates

Assessment		PEK community-based (child care) Cohort 1	Raw scores: Kindergarten classmates[a] With preschool/ child care center	Raw scores: Kindergarten classmates[a] Without preschool/ child care center
Total Social Skills subscales				
Cooperation	Mean	13.6	14.8	14.6
	Adjusted mean[b]	14.3	15.0	14.2
	Number assessed	36	120	130
Assertion	Mean	12.9	11.9	12.5
	Adjusted mean[b]	13.1	12.1	12.2
	Number assessed	36	124	130
Self-control	Mean	13.2	14.3	14.8
	Adjusted mean[b]	13.7	14.5	14.5
	Number assessed	34	121	134
Problem Behaviors subscales				
Externalizing	Mean	2.8	1.4	1.5
	Adjusted mean[b]	2.3	1.4*	1.7
	Number assessed	37	128	140
Internalizing	Mean	2.0	2.0	1.6
	Adjusted mean[b]	1.8	1.9	1.7
	Number assessed	37	130	139
Hyperactivity	Mean	5.6	3.3	3.4
	Adjusted mean[b]	5.0	3.1**	3.7
	Number assessed	38	126	139

[a] *Upon kindergarten entry, PEK Cohort 1 child care children were compared to PEK school-based Cohort 2 (Figure A34) as well as the PEK school-based Cohort 2 comparison group (presented here). The comparison group was divided into two groups – those who attended preschool, Head Start, or a child care center (other than PEK) prior to attending kindergarten, and those who did not. Children with missing data on preschool/child care experience were included in the no preschool/child care center group.*

[b] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

* *p<.05, compared to community-based Cohort 1.*

** *p<.01, compared to community-based Cohort 1.*

A33. PEK community component (fall 2007). Teacher ratings of social skills, problem behaviors, and academic competence in kindergarten: PEK community-based Cohort 1 vs. PEK school-based Cohort 2

Assessment		Standard score[a] PEK community-based (child care) Cohort 1	PEK school-based Cohort 2
Social Skills Rating System			
Total Social Skills	Mean	98.4	106.4
	Adjusted mean[b]	98.7	106.3**
	Number assessed	38	238
Problem Behaviors	Mean	103.3	93.6
	Adjusted mean[b]	101.9	93.8***
	Number assessed	38	244
Academic Competence	Mean	93.7	97.1
	Adjusted mean[b]	93.1	97.2
	Number assessed	38	242

[a] *Standard scores have a mean of 100 and a standard deviation of 15 in the national normative sample.*

[b] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

** *p<.01, compared to community-based Cohort 1.*

*** *p<.001, compared to community-based Cohort 1.*

A34. PEK community component (fall 2007). Teacher ratings of social skills and problem behaviors in kindergarten: Subscale results for PEK community-based Cohort 1 vs. PEK school-based Cohort 2

Assessment		Raw scores: PEK community-based (child care) Cohort 1	Raw scores: PEK school-based Cohort 2
Total Social Skills subscales			
Cooperation	Mean	13.6	16.0
	Adjusted mean[a]	14.0	15.9**
	Number assessed	36	235
Assertion	Mean	12.9	13.7
	Adjusted mean[a]	12.6	13.7
	Number assessed	36	232
Self-control	Mean	13.2	15.5
	Adjusted mean[a]	13.5	15.4*
	Number assessed	34	236
Problem Behaviors subscales			
Externalizing	Mean	2.8	1.4
	Adjusted mean[a]	2.5	1.4**
	Number assessed	37	243
Internalizing	Mean	2.0	1.4
	Adjusted mean[a]	2.0	1.4
	Number assessed	37	243
Hyperactivity	Mean	5.6	2.7
	Adjusted mean[a]	5.1	2.8***
	Number assessed	38	243

[a] *Adjusted for gender, age, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner status, and Special Education status differences among the groups being compared.*

* *p<.05, compared to community-based Cohort 1.*

** *p<.01, compared to community-based Cohort 1.*

*** *p<.001, compared to community-based Cohort 1.*

A35. PEK community component (spring 2007). Providers' experiences with PEK professional development

Please indicate your agreement with the statements below.	Participant group	Number of participants: Strongly agree	Somewhat agree	Disagree	Strongly disagree
Participation in PEK professional development has had a large impact on my teaching practices.	Center teachers[a]	6	-	-	1
	Family providers[b]	9	1	-	-
The assistance I received from PEK in goal setting has been helpful for me.	Center teachers[a]	6	-	-	1
	Family providers[b]	9	1	-	-
Goal setting is an important part of my progress/growth as a teacher.	Center teachers[a]	6	-	-	1
	Family providers[b]	7	3	-	-
I received enough support with goal setting.	Center teachers[a]	4	2	-	1
	Family providers[b]	6	4	-	-
Pre-visit home calls better prepare me for the coach's visits.	Family providers[b]	6	3	1	-
Participation in PEK professional development has had a large impact on practices at my child care center.	Center directors[c]	3	-	-	-

[a] *N=7.*

[b] *N=10.*

[c] *N=3.*

Notes: *Self-administered questionnaires were administered to child care center teachers, center directors, and family child care home providers at the conclusion of the spring 2008 focus group sessions. Survey questions varied somewhat among the three groups, and data for individual questions are provided for the groups that were asked that question.*

A36. PEK community component (spring 2007). PEK's impact on teaching

Please indicate your agreement with the statements below.	Participant group	Number of participants: Strongly agree	Somewhat agree	Disagree	Strongly disagree
I have used the new teaching activities and practices that I learned from PEK regularly.	Center teachers[a]	6	-	-	1
	Family providers[b]	8	1	-	-
I better prepare children for school because of my participation in PEK.	Center teachers[a]	6	-	-	1
	Family providers[b]	8	2	-	-
My center better prepares children for school because of my participation in PEK.	Center directors[c]	3	-	-	-

[a] *N=7.*

[b] *N=9-10.*

[c] *N=3.*

Notes: *Self-administered questionnaires were administered to child care center teachers, center directors, and family child care home providers at the conclusion of the spring 2008 focus group sessions. Survey questions varied somewhat among the three groups, and data for individual questions are provided for the groups that were asked that question.*