MINNESOTA SCHOOL READINESS YEAR TWO STUDY:

Fall 2003

Developmental Assessment at Kindergarten Entrance

Minnesota Department of Education

Acknowledgements

The *Minnesota School Readiness Year Two Study: Developmental Assessment at Kindergarten Entrance Fall 2003* was planned, implemented, and the report prepared by the Minnesota School Readiness Study Team representing the Minnesota Department of Education (MDE) and the Minnesota Department of Human Services (DHS).

Team members include:

Karen Carlson, Director, MDE
Betty Cooke, MDE
Elizabeth Kane, DHS
Wayne Kuklinski, MDE
Anita Larson, Data Consultant
Barbara O Sullivan, DHS
Deb Swenson-Klatt, DHS
Nancy Wallace, Assessment Consultant
Avisia Whiteman, DHS

Special thanks to the 52 Minnesota elementary schools involved in the study and their principals and kindergarten teachers. The observation and collection of developmental information by these kindergarten teachers on all kindergarten children in their classrooms was essential to the study and is much appreciated. In addition, thanks to the many community members who serve on the study advisory committee for their advice and support.

For more information contact:
Betty Cooke at 651.582.8329 or betty.cooke@state.mn.us or
Barbara O Sullivan at 651.297.2070 or barbara.osullivan@state.mn.us

Date of Report: February 2004

Minnesota Department of Education

Minnesota Department of Human Services

Table of Contents

Minnesota School Readiness Year Two Study: Developmental Assessment at Kindergarten Entrance Fall 2003

Table of Contents

Minnesota School Readiness Year Two Study: Developmental Assessment at Kindergarten Entrance Fall 2003

¤ The Work Sampling System is a registered trademark of Pearson Education, Inc. publishing as Pearson Early Learning.

List of Charts and Tables

Minnesota School Readiness Study: Developmental Assessment at Kindergarten Entrance

A large and growing body of research supports the critical relationship between early childhood experiences and successful life-long outcomes. In recognition of this, in 2002 the then Minnesota Department of Children, Families and Learning included within their goal of High Achievement for All Students the indicator: Increase the percentage of young children who are ready for school. The report, *Minnesota School Readiness Initiative: Developmental Assessment at Kindergarten Entrance Fall 2002 Pilot Study (2003)*, documents the school readiness of a sample of Minnesota kindergartners in the fall of 2002. The recently renamed Minnesota Department of Education (MDE), in partnership with the Minnesota Department of Human Services (DHS), continues emphasis on accountability as part of the theme of academic excellence. Assessing the readiness of children as they enter school is a high priority. This report describes findings from Year Two of the assessment of school readiness with a larger random sample of children entering kindergarten in fall 2003.

It is the intent of the Minnesota School Readiness Study to use results to inform school administrators and teachers; parents; early childhood care and education teachers, providers, and administrators; policymakers; and the public about progress towards the goals of ensuring that children are ready for school and schools are ready for children. It is expected that the results will promote children s learning and development over time by improving early childhood programs and services, better preparing schools to meet the needs of children as they enter school, and easing the transition for children and families from home to school. The information gathered to complete the developmental checklists is a valuable resource to teachers in modifying curriculum, working with individual children in their classrooms, preparing for parent conferences, and identifying children eligible for Title I and other services.

Definition of School Readiness

For this study, school readiness is defined as the skills, knowledge, behaviors, and accomplishments that children know and can do as they enter kindergarten in the following areas of child development:

- Physical well being and motor development
- Social and emotional development
- Approaches to learning
- Language development
- Cognition and general knowledge
- Creativity and the arts

This definition is consistent with school readiness definitions used by other states and the *Minnesota Early Childhood Indicators of Progress: A Resource Guide (2000)*. It also reflects the National Education Goals Panel (NEGP) definition that identifies three important components of school readiness: (1) readiness in the child, (2) schools readiness for children, and (3) family and community supports and services that contribute to children s readiness (Child Trends, 2001; NEGP, 1998). In the first pilot year of the school readiness assessment in Minnesota, child readiness was the component of focus. This focus continues in Year Two. With the addition of a parent survey, family and community supports and services contributing to children s readiness are beginning to be examined. Assessment of schools readiness for children will be considered for study in future years.

2002 Pilot School Readiness Study Summary

The first year *Minnesota School Readiness Initiative: Developmental Assessment at Kindergarten Entrance Fall 2002 Pilot Study* (2003) had as its objectives: (1) to pilot a system for assessing the school readiness of a sample of Minnesota kindergarten children and (2) to obtain a picture of the readiness of a sample of Minnesota kindergarteners entering Minnesota elementary schools in the fall of 2002 through this piloted system. Both were accomplished.

Using five domains in the Work Sampling System¤ of child assessment that correspond to the domains in the definition of school readiness above, the sample of 1,852 kindergarten children was most proficient in the area of physical development (N = 1,143, 62%), followed by personal and social development (N = 899, 49%) and the arts (N = 885, 48%) and least proficient in the areas of language and literacy (N = 819, 44%) and mathematical thinking (N = 785, 42%). The most children were in process or inconsistent in exhibiting the skills, knowledge, behaviors, or accomplishments in mathematical thinking (N=816, 44%), followed by the arts (N=779, 42%), personal and social development (N=708, 38%), language and literacy (N=704, 38%), and physical development (N=629, 34%). Ten percent or more of the sample children were not yet exhibiting the skills, knowledge, behaviors, or accomplishments in four of the five areas of learning. Language and literacy (N=289, 18%) was the area in which the most children were rated not yet , followed by mathematical thinking (N=247, 13%), personal and social development (N=238, 13%), the arts (N=181, 10%), and physical development (N=77, 4%).

The purposes of Year Two of the study were: (1) to provide a second year of a statewide profile of children s school readiness with a larger sample of kindergarten children and (2) to pilot a parent survey requesting early childhood care and education and family background information based on recommendations in the first year study.

Continued Use of Work Sampling System¤ of Child Assessment and Developmental Checklist

The Minnesota School Readiness Year Two Study again involved use of a customized Minnesota Work Sampling System¤ (WSS) Kindergarten Entry Developmental Checklist with a sample of Minnesota kindergartners in a randomly selected sample of elementary schools in the fall of 2003. The Work Sampling System, a standards-based observational assessment system designed to provide information about individual student s achievement and progress over time (Dichtelmiller, Jablon, Dorfman, Marsden, & Meisels, 2001), was used again for Year Two of the assessment for the following reasons:

(1) MDE has provided training in and encouraged use of the WSS in Minnesota public school School Readiness programs and other early childhood programs since 1994.

(2) The WSS is a required assessment for all Title I children in kindergarten, and, consequently, most Minnesota kindergarten teachers are already trained in use of it.

(3) The WSS meets all of the criteria of authentic assessment:

- ¥ Fair to all children regardless of culture, language background, developmental level, family background, learning style, etc.;
- ¥ Uses familiar tasks and everyday classroom activities;
- ¥ Conducted in familiar settings with familiar people;
- ¥ Based on multiple sources of information; and
- ¥ Continuous and ongoing to show progress and growth over time (Dichtelmiller & Jablon, 1993; Hill, 1992; Scott-Little & Niemeyer, 2001).

The customized Minnesota WSS developmental checklist that was created for the pilot study was revised and used by kindergarten teachers to again assess new kindergarteners during the first six weeks of the 2003-2004 school year. Two developmental indicators were added to the original thirty indicators selected from the WSS *Preschool - 4 Developmental Guidelines* (Dichtelmiller, Jablon, Marsden, & Meisels, 2001). These indicators were added based on recommendations from the study advisory committee — one to add another personal and social indicator that allowed children to show what they know and can do in a group situation (show empathy and caring for others) and another to complete inclusion of all required indicators within the National Head Start Child Outcomes Framework (begins to develop knowledge about letters, an indicator within the language and literacy domain).

The checklist includes ten indicators in the personal and social development domain (approaches to learning is included in this domain), eleven indicators in language and literacy, four in mathematical thinking, four in the arts, and three in physical development (see Appendix A). These indicators were selected because they represent what children should be able to do at the end of the year before they enter kindergarten based on widely held developmental expectations.

As in the pilot study, kindergarten teachers observed and documented students responses to everyday classroom activities that are already part of the ongoing curriculum and instruction process to rate children s performance. Each domain and developmental indicator within the WSS developmental checklist includes expected behaviors for children at that age or grade level. For each indicator, teachers use guidelines to rate the child s performance as:

Not Yet — indicating that the child cannot perform the indicator, i.e., that the performance indicator represents a skill, an area of knowledge, or a specific set of behaviors or accomplishments that the child has not acquired.

In Process — implying that the skills, knowledge, behaviors, or accomplishments represented by this indicator are intermittent or emergent, and are not demonstrated reliably or consistently.

Proficient — meaning that the child can reliably demonstrate the skills, knowledge, behaviors, or accomplishments represented by this performance indicator.

Teachers use the *Work Sampling System Development Guidelines* books for the age group with whom they work to rate children based on their observations and documentation and the correspondence between these observations and documentations and the rationales and examples for each indicator as described in the *Guidelines*. The *WSS Developmental Guidelines* are designed to enhance the process of observation and to ensure the reliability and consistency of teachers observations (Dichtelmiller, Jablon, Marsden, & Meisels, 2001). Appendix B includes sample rationales and examples for a selected indicator in each of the five domains as an example of the guidelines that teachers use in making their ratings.

The developmental checklist included a place for teachers to indicate each child s gender and a section for teachers or other school staff to insert the Minnesota Automated Reporting Student System (MARSS) Code for the child. This code is assigned to each student once they enter the K-12 system sometime during the kindergarten year unless the child has previously been identified as qualifying for special education, which leads to code assignment at time of identification. The MARSS Code was requested in order to learn if this child identifier is universally available to teachers at the time of the kindergarten assessment during the first few weeks of school. If available, the code would allow for elimination of demographic questions on the parent survey; it would *not* be used to identify or track individual children. Each checklist also had a space for inserting a two-digit building code that was completed by study staff prior to mailing the checklists to the schools.

Parent Survey

Added to the study in Year Two was a parent survey printed on the reverse side of the developmental checklist to be completed by parents just before or during the six weeks period that children were observed and assessed by their kindergarten teachers (see Appendix A). Many elementary schools hold orientations or open houses for kindergarten parents within a few days of the beginning of kindergarten, and some kindergarten teachers do home visits with each student. It was expected that these were logical times for the teachers to ask the parents to complete and return the surveys. Parents who completed the survey were given a copy of the book *Winning Ways to Learn Ages 6, 7 & 8: 600 Great Ideas for Children* (Meisels, Stetson, & Marsden, 2000).

The parent survey included questions regarding early childhood care and education experience and family information. The early childhood care and education experience questions were intended to obtain information about the care and education experiences of each child in the study in the year prior to kindergarten. The family information questions focused on demographic data on the child and the child s family that have been shown to be associated with school readiness in other research.

Study Preparation

In the spring of 2003, an invitation was sent to a pool of randomly selected elementary school principals with a request for a response. All schools involved in the study were identified by late August. Packets of information with the customized WSS developmental checklists were then mailed to principals and kindergarten teachers in the 52 participating elementary schools. These materials included kindergarten teacher instructions and a timeline for the process, a *Work Sampling System Preschool-4 Guidelines 4th Edition* booklet for each teacher, a chart listing the 32 preschool-4 school readiness indicators being assessed alongside a list of the corresponding 32 kindergarten indicators with the rationale and examples for each from the *Work Sampling System Preschool-4* and *Kindergarten Guidelines 4th Edition* booklets, and tips for using the WSS in the first six weeks of school. In addition, the selected schools were mailed enough copies of the book *Winning Ways to Learn Ages 6, 7 & 8: 600 Great Ideas for Children* for teachers to give parents who completed the parent survey.

All kindergarten teachers in selected elementary schools were asked to observe all children in their classrooms between the first week of school and October 15, 2003 in order to minimize the impact of kindergarten instruction on observational results. Teachers documented what they observed, rated each child s performance on each indicator using the *Work Sampling System Preschool-4 Guidelines 4th Edition* booklet, and recorded their ratings on a Minnesota Work Sampling System (WSS) ¤ Kindergarten Entry Developmental Checklist for each child. Kindergarten teachers also asked one parent/guardian of each student in their classroom to complete the parent survey side of the form during orientations, open houses, home visits, or other contacts they had with them. Resources did not allow for translation of the parent survey into multiple languages, so teachers were asked to use the method that worked best for them to have parents who were English-Language Learners complete the survey.

Teachers used the For teacher use only box at the bottom of the developmental checklist to enter a child code meaningful to them in order to be sure that the parent survey responses for each child corresponded (1) to their developmental assessment ratings for that same child and (2) to the MARSS Code for the child entered on the checklist side of the form.

Completed checklists and parent surveys were returned to DHS where they were reviewed and forwarded to NCS Pearson for scanning, scoring, and data summary. Study staff did additional analysis of assessment data in relationship to items on the family information portion of the parent survey, noting whether the parent who completed the survey was the child s mother, father, or another person; the highest level of education completed by the parent completing the form; the household s yearly income; the race/ethnicity of the child; the language spoken most often at home; and whether the child received special education through an Individual Education Plan (IEP) or Individual Interagency Intervention Plan (IIIP).

Aggregated statewide results are presented for all schools in this sample. School-level information was provided to participating schools. Other statewide data presented are comparisons of Year One and Year Two developmental assessment results, Year Two early childhood care and education experiences and family information results, and the relationships between Year Two developmental assessment results and specific categories of family information results.

Sample Demographics

Selecting a demographically and geographically representative sample of kindergarten children was a high priority for the study. This was done by randomly selecting schools from six strata that differentiate schools based on size and location. The pool from which schools were selected did not include charter, specialty, and private schools. As one school from a given strata declined participation, an invitation was extended to another randomly selected school from that same strata. Through this process, a potential pool of 3,500 kindergarten children from 55 schools was identified. A sample of this size was chosen because

it represented over five percent of the population of the age cohort. The final sample contained 3,002 kindergarten children from 52 schools taught by 128 kindergarten teachers. A sample of 2,537 would provide a valid sample of the kindergarten cohort at a 95 percent confidence level and a margin of error of plus or minus 2.5 percent. This sample exceeded this size at 3,002.

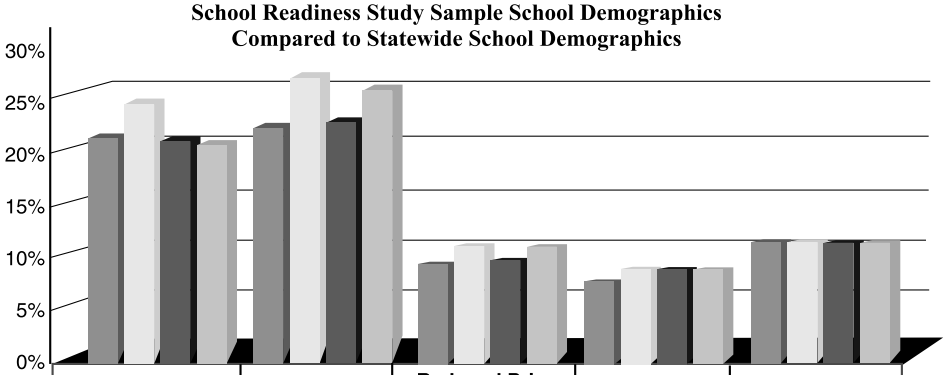
The most recent elementary school-level demographic data was obtained from Data Applications, Office of Information Technology at MDE. These data included:

- Enrollment in the Free Lunch program (incomes 135% Federal Poverty Guidelines (FPG) and under)
- Enrollment in the Reduced Price Lunch program (incomes between 136% and 185% FPG)
- Limited English Proficiency (LEP)
- Minority rate (Asian, Black, Caucasian, Hispanic, Native American)
- Receipt of Special Education

Randomly selected schools were offered the opportunity to participate. Sample schools were geographically distributed across urban, suburban, and rural areas of the state within the six strata used to differentiate schools by size and location (See Table 1). The stratum with the lowest representation was stratum three which encompasses school districts in suburban areas. In Year One, achieving a representative sample was particularly challenging since the admission or omission of a single school, depending upon its size, could have a dramatic impact on the sample (N=1,851). Having a larger sample in Year Two (N=3,002) minimized the effects of individual schools dropping in and out of the sample. ***Even more so than in 2002, the demographic make-up of schools in the 2003 sample is very comparable to that of all Minnesota elementary schools*** (See Chart 1).

Strata	Table 1: Geographic Distribution of Year Two Sample Kindergartners by Strata Compared to Statewide Kindergarten Population				
	Statewide N	Sample %	Statewide N	Sample %	Difference between Sample & State
1	7,794	14%	410	14%	<1%
2	23,543	41%	1,161	39%	-2%
3	12,815	22%	547	18%	-4%
4	7,109	12%	491	16%	4%
5	4,423	8%	245	8%	<1%
6	1,690	3%	148	5%	2%
TOTAL	**57,374**	**100%**	**3,002**	**100%**	

Chart 1. Year One and Year Two
School Readiness Study Sample School Demographics
Compared to Statewide School Demographics



	Minority Rate	Free Lunch	Reduced Price Lunch	LEP	Special Education
Statewide 2002	21%	22%	8%	7%	11%
Sample 2002	24%	26%	10%	8%	11%
Statewide 2003	21%	23%	8%	8%	11%
Sample 2003	20%	25%	10%	8%	11%

Results of Year Two Developmental Assessment at Kindergarten Entrance

Results of the Year Two kindergarten entrance developmental assessment are presented along the five domains assessed: personal and social development, language and literacy, mathematical thinking, the arts, and physical development. ***Because children develop and grow along a continuum with great variability, the goal of the study is to assess children s proficiency within and across these developmental domains and not establish whether or not children are ready for school with the use of a ready or not ready score.*** Young children develop rapidly and at varying rates across the domains, and an early, definitive determination of readiness can have unintended negative consequences. Consequently, the three WSS readiness levels are used — not yet, in process, and proficient — for each domain to provide an overview of children s readiness that does not label or stigmatize young children and recognizes variation across many indicators of development within and across domains.

Table 2 provides an average score summary of how the 3,002 kindergarten children in the sample were rated by their kindergarten teachers across the five domains according to the three readiness levels. Charts 2 — 6 display this same information by domain. Table 3 provides the same five domain totals along with the aggregation of teacher ratings by indicator ranked according to domain scores and indicators within each domain in relation to proficiency rates from highest to lowest. The readiness levels used for rating are: (1) proficient — children consistently show the skills, knowledge, behaviors, or accomplishments represented by an indicator; (2) in process — children sometimes show the skills, knowledge, behaviors, or accomplishments but do so inconsistently; and (3) not yet — children cannot perform the skill, area of knowledge, or specific set of behaviors or accomplishments. For a picture of the number of children who can perform a particular skill, area of knowledge, or specific set of behaviors or accomplishments consistently or inconsistently versus the number of children who have not yet acquired a skill, area of knowledge, or specific set of behaviors or accomplishments, readers might choose to combine proficient and in process ratings and compare against those rated not yet.

Table 2 shows that the kindergarten children in the sample were most proficient in the area of physical development (N = 1,702, 57%), followed by personal and social development (N = 1,407, 47%) and the arts (N = 1,391, 47%), and they were least proficient in the areas of language and literacy (N = 1,283, 43%) and mathematical thinking (N = 1,186, 40%). The most children were in process or inconsistent in exhibiting the skills, knowledge, behaviors, or accomplishments in mathematical thinking (N = 1,489, 50%), followed by the arts (N = 1,413, 48%), language and literacy (N = 1,363, 46%), personal and social development (N = 1,317, 44%), and physical development (N = 1,207, 41%). More than ten percent of the sample children were not yet exhibiting the skills, knowledge, behaviors, or accomplishments in language and literacy (N = 345, 12%) and mathematical thinking (N = 318, 11%). These were followed by personal and social development (N = 266, 9%), the arts (N = 170, 6%), and physical development (N = 76, 2%).

Table 2: Readiness Levels By Domain
(Number and Percent) N= 3,002

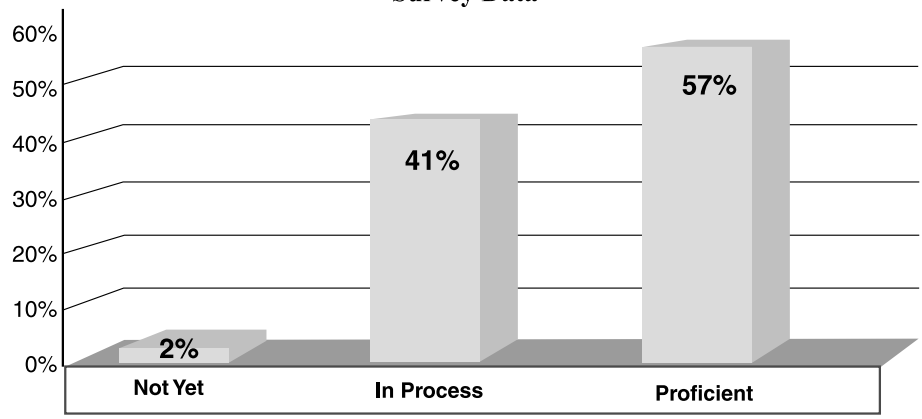
Domain	Not Yet	In Process	Proficient
Physical Development	N = 76 2%	N = 1,207 41%	N = 1,702 57%
Personal & Social Development	N = 266 9%	N = 1,317 44%	N = 1,407 47%
The Arts	N = 170 6%	N = 1,413 48%	N = 1,391 47%
Language & Literacy	N = 345 12%	N = 1,363 46%	N = 1,283 43%
Mathematical Thinking	N = 318 11%	N = 1,489 50%	N = 1,186 40%

* Note that categories may not add to 100% due to rounding.

Physical Development

Out of the five domains, sample children were most proficient in the domain of physical development (See Chart 2, Table 3). Performs some self-care tasks independently was the indicator at which the sample of kindergarten children was most proficient (62%), followed by coordinates movements to perform simple tasks (56%) and uses eye-hand coordination to perform tasks (53%). In process ratings in this area of learning were as follows: uses eye-hand coordination to perform tasks (44%), coordinates movements to perform simple tasks (42%), and performs some self-care tasks independently (36%). Three percent or less of the children sampled were not yet able to perform the tasks reflected in the indicators.

Chart 2. Physical Development Domain Survey Data



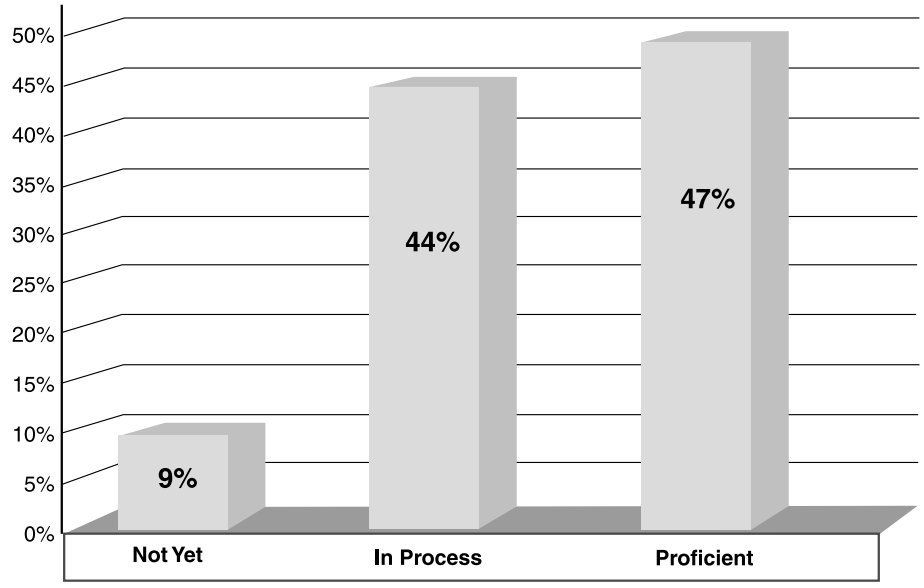
Personal and Social Development

The domain in which the sample of children was next most proficient was personal and social development (See Chart 3, Table 3). Children at kindergarten entry were most proficient with the indicators of interacts easily with one or more children and interacts easily with familiar adults (54% each) and shows eagerness and curiosity as a learner (53%). These were followed by shows empathy and caring for others and follows simple classroom rules and routines (48% each), manages transitions (47%), and shows some self-direction (46%). Proficiency ratings were lower with regard to the personal and social indicators of attends to tasks and seeks help when encountering a prob-

lem and seeks adult help when needed to resolve conflicts (42% each) and approaches tasks with flexibility and inventiveness (37%).

In process ratings were as follows in personal and social development: approaches tasks with flexibility and inventiveness (49%); seeks adult help when needed to resolve conflicts (48%); attends to tasks and seeks help when encountering a problem (47%); shows some self-direction (46%); manages transitions, shows empathy and caring for others, and follows simple classroom rules and routines (44% each); shows eagerness and curiosity as a learner (41%); and interacts easily with familiar adults and interacts easily with one or more children (39% each). Ten percent or more of the children in the sample were rated not yet on three indicators in this area: approaches tasks with flexibility and inventiveness (14%), attends to tasks and seeks help when encountering a problem (11%), and seeks adult help when needed to resolve conflicts (10%). Other not yet ratings were manages transitions and shows some self-direction (9% each), follows simple classroom rules and routines and shows empathy and caring for others (8% each), interacts easily with one or more children and interacts easily with familiar adults (7% each), and shows eagerness and curiosity as a learner (6%).

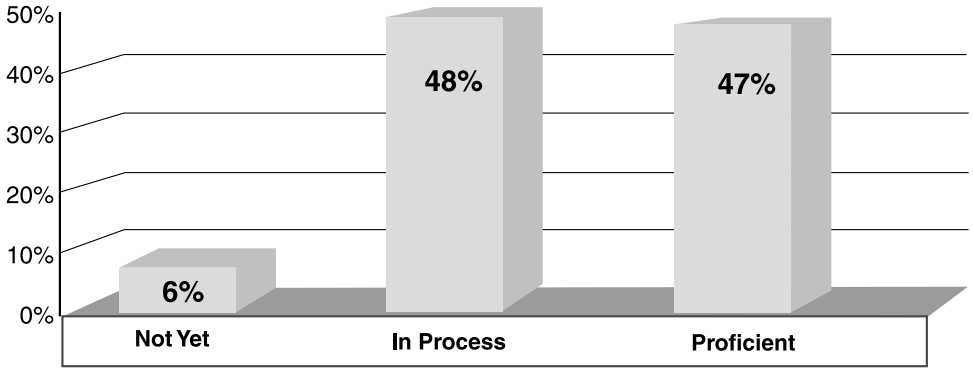
Chart 3. Personal and Social Development Domain Summary Data



The Arts

The arts was the domain with the next highest number of children showing proficiency (See Chart 4, Table 3). Children in the sample showed highest proficiency with the arts indicator participates in group music experiences (52%), followed by participates in creative movement, dance, and drama (47%); uses a variety of art materials for tactile experiences and exploration (46%); and responds to artistic creations or events (43%). In process ratings were responds to artistic creations or events (50%); uses a variety of art materials for tactile experience and exploration (49%); participates in creative movement, dance, and drama (46%); and participates in group music experiences (45%). The not yet ratings were highest in responds to artistic creations or events (7%); followed by participates in creative movement, dance, and drama and uses a variety of art materials for tactile experiences and exploration (6% each); and participates in group music experiences (4%).

Chart 4. The Arts Domain Summary Data



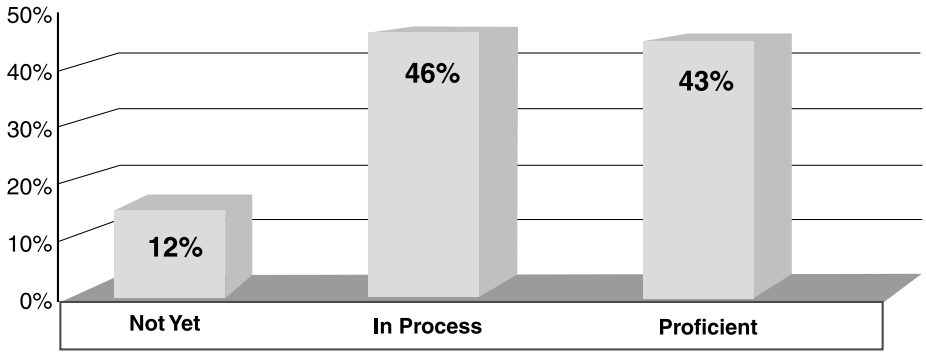
Language and Literacy

Language and literacy was the domain with next to the least number of children displaying proficiency (See Chart 5, Table 3). Over 50 percent of the sample was proficient in two of the eleven indicators in language and literacy — speaks clearly enough to be understood without contextual clues (59%) and shows appreciation of books and reading (56%). From 43 to 48 percent of the children were rated proficient on four of the indicators: comprehends and responds to stories read aloud and gains meaning by listening (48% each), follows two- or three-step directions (44%), and uses expanded vocabulary and language for a variety of purposes (43%). Less than 40 percent of the sample of children was proficient on the remaining five indicators assessed in this domain: represents ideas and stories through pictures, dictation, and play and shows beginning understanding of concepts about print (39% each); begins to develop knowledge about letters (38%); demonstrates phonological awareness (i.e., the ability to hear and discriminate the sounds of language) (30%); and uses letter-like shapes, symbols, and letters to convey meaning (29%).

For in process ratings uses letter-like shapes, symbols, and letters to convey meaning (52%) was highest followed by represents ideas and stories through pictures, dictation, and play and demonstrates phonological awareness (51% each); shows beginning understanding of concepts about print (50%); begins to develop knowledge about letters (49%); gains meaning by listening and comprehends and responds to stories read aloud (45% each); uses expanded vocabulary and language for a variety of purposes (44%); follows two- or three-step directions (43%); shows appreciation of books and reading (40%); and speaks clearly enough to be understood without contextual clues (33%). Only in the domain of language and literacy was 20 percent of the sample of kindergarten children not yet able to demonstrate the skills, knowledge, behaviors, or accomplishments represented by a specific indicator:

demonstrates phonological awareness (20%). This was followed by uses letter-like shapes, symbols, and letters to convey meaning (19%); uses expanded vocabulary and language for a variety of purposes (14%); follows two- or three-step directions and begins to develop knowledge about letters (13% each); shows beginning understanding of concepts about print (12%); represents ideas and stories through pictures, dictation, and play (11%); speaks clearly enough to be understood without contextual clues (8%); comprehends and responds to stories read aloud and gains meaning by listening (7% each); and shows appreciation of books and reading (5%).

Chart 5. Language and Literacy Domain Summary Data



Mathematical Thinking

The domain with the least number of children showing proficiency was in mathematical thinking (See Chart 6 and Table 3). Less than 50 percent of the sample of kindergarten children was proficient at these four indicators of mathematical thinking: begins to recognize and describe the attributes of shapes and shows understanding of and uses several positional words (44% each), shows beginning understanding of number and quantity (39%), and begins to use simple strategies to solve mathematical problems (32%). Begins to use simple strategies to solve mathematical problems (53%), shows beginning understanding of number and quantity (50%), begins to recognize and describe the attributes of shapes (49%), and shows understanding of and uses several positional words (47%) were the in process ratings. In three out of the four indicators of mathematical thinking, not yet ratings were 10 percent or more: begins to use simple strategies to solve mathematical problems (15%), shows beginning understanding of number and quantity (11%), shows understanding of and uses several positional words (10%), and begins to recognize and describe the attributes of shapes (8%).

Chart 6. Mathematical Thinking Domain Summary Data

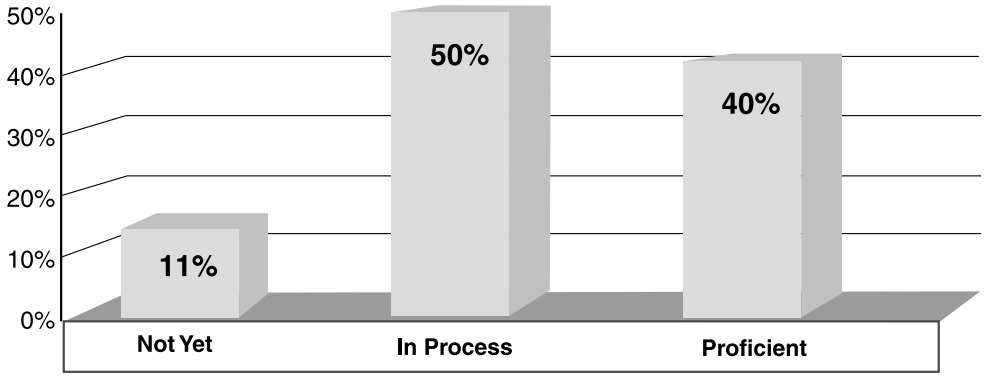


Table 3. Readiness Levels by Domain Indicators Ranked by Proficiency Rating	Readiness Levels, N=3,002					
	Not Yet		In Process		Proficient	
¥ Physical Development	**Percent**	**N**	**Percent**	**N**	**Percent**	**N**
Physical Development Domain Average Score Summary	2%	76	41%	1,207	57%	1,702
Performs some self-care tasks independently.	2%	55	36%	1,077	62%	1,841
Coordinates movements to perform simple tasks.	2%	70	42%	1,243	56%	1,677
Uses eye-hand coordination to perform tasks.	3%	103	44%	1,301	53%	1,589
¥ Personal and Social Development						
Personal and Social Development Domain Average Score Summary	9%	266	44%	1,317	47%	1,407
Interacts easily with one or more children.	7%	208	39%	1,161	54%	1,625
Interacts easily with familiar adults.	7%	204	39%	1,179	54%	1,612
Shows eagerness and curiosity as a learner.	6%	170	41%	1,239	53%	1,587
Shows empathy and caring for others.	8%	252	44%	1,315	48%	1,445
Follows simple classroom rules and routines.	8%	231	44%	1,315	48%	1,427
Manages transitions.	9%	277	44%	1,319	47%	1,393
Shows some self-direction.	9%	260	46%	1,364	46%	1,370
Attends to tasks and seeks help when encountering a problem.	11%	341	47%	1,397	42%	1,258
Seeks adult help when needed to resolve conflicts.	10%	299	48%	1,412	42%	1,253
Approaches tasks with flexibility and inventiveness.	14%	420	49%	1,471	37%	1,096
¥ The Arts						
The Arts Domain Average Score Summary	6%	170	48%	1,413	47%	1,391
Participates in group music experiences.	4%	111	45%	1,336	52%	1,546
Participates in creative movement, dance, and drama.	6%	188	46%	1,390	47%	1,416
Uses a variety of art materials for tactile experience and exploration.	6%	171	49%	1,456	46%	1,361
Responds to artistic creations or events.	7%	208	50%	1,468	43%	1,239
¥ Language and Literacy						
Language and Literacy Domain Average Score Summary	12%	345	46%	1,363	43%	1,283
Speaks clearly enough to be understood without contextual clues.	8%	250	33%	986	59%	1,758
Shows appreciation for books and reading.	5%	149	40%	1,180	56%	1,661
Gains meaning by listening.	7%	198	45%	1,351	48%	1,442
Comprehends and responds to stories read aloud.	7%	200	45%	1,344	48%	1,442
Follows two- or three-step directions.	13%	382	43%	1,209	44%	1,319
Uses expanded vocabularly and language arts for a variety of purposes.	14%	404	44%	1,308	43%	1,279
Represents ideas and stories through pictures, dictation, and play.	12%	356	50%	1,483	39%	1,157
Shows beginning understanding of concepts about print.	11%	323	51%	1,509	39%	1,154
Begins to develop knowledge about letters.	13%	378	49%	1,474	38%	1,140
Demonstrates phonological awareness.	20%	600	51%	1,509	30%	881
Uses letter-like shapes, symbols, and letters to convey meaning.	19%	554	52%	1,561	29%	877
¥ Mathematical Thinking						
Mathematical Thinking Domain Average Score Summary	11%	318	50%	1,489	40%	1,186
Begins to recognize and describe the attributes of shapes.	8%	232	49%	1,456	44%	1,305
Shows understanding of and uses of several positional words.	10%	283	47%	1,402	44%	1,303
Shows beginning understanding of number and quantity.	11%	320	50%	1,500	39%	1,175
Begins to use simple strategies to solve mathematical problems.	15%	437	53%	1,596	32%	959

Summary of Year Two Data

Kindergarten children in the sample were most proficient in the domain of physical development (57%). Less than half of the sample was proficient overall in the domains of personal and social development and the arts (47% each), language and literacy (43%), and mathematical thinking (40%). Sample children were in process or inconsistent most frequently in mathematical thinking (50%), followed by the arts (48%), language and literacy (46%), personal and social development (44%), and physical development (41%). When combining ratings for consistent (proficient) and emerging or inconsistent (in process) skills, knowledge, behaviors, or accomplishments, children were rated as follows: physical development (98%), the arts (95%), personal and social development (91%), mathematical thinking (90%), and language and literacy (89%), reflecting the same top three and lower two rankings among the five areas of development. These are children who demonstrate readiness skills, knowledge, behaviors, or accomplishments consistently or inconsistently versus those who have not yet acquired a skill, area of knowledge, or specific set of behaviors or accomplishments. ***More than ten percent of the children in the sample were rated not yet in language and literacy (12%) and mathematical thinking (11%). In personal and social development, nine percent were not yet, with only six percent in the arts and two percent in physical development rated not yet.***

Across the five domains, children in the sample were generally more proficient on the simpler, less challenging indicators. As skills, knowledge, behaviors, or accomplishments become more complex and demanding, ratings decline. For example:

- In the domain of language and literacy, the highest proficiency levels were shown in the child s ability to speak clearly enough to be understood without contextual clues (59%) and in showing appreciation for books and reading (56%). Tasks demanding more complex acts from the children were indicators where proficiency was lower — representing ideas and stories through pictures, dictation, and play and showing beginning understanding of concepts about print (39% each) and beginning to develop knowledge about letters (38%). Children in the sample found the most challenging tasks to be use of letter-like shapes, symbols, and letters to convey meaning (29% proficient) and demonstration of phonological awareness (30% proficient).

- Children in the sample were also challenged by indicators in the domain of mathematical thinking — the task of beginning to use simple strategies to solve mathematical problems (32% proficient) and showing beginning understanding of number and quantity (39% proficient).
- In the personal and social domain, the indicators where most proficiency was demonstrated are those related to interaction with adults and peers — interacting easily with other children and with familiar adults (54% each) and one reflecting a basic approach to learning — shows eagerness and curiosity as a learner (53%). The sample of kindergarten children was less proficient at other, somewhat more complex approaches to learning including approaching tasks with flexibility and inventiveness (37% proficient) and seeking help when needed to resolve conflicts and attending to tasks and seeking help when encountering a problem (42% each proficient).
- In the arts, response was fairly balanced across the four indicators, with participation in group music experiences showing the highest percentage of proficiency (52%). Less than half of the sample of children was proficient with the other three indicators which might be considered areas requiring more active engagement of the child — participating in creative movement, dance, and drama (47%); using a variety of art materials for tactile experiences and exploration (46%); and responding to artistic creations or events (43%).

Gender and MARSS Code

Not all teachers marked the gender of each child on the developmental checklist. Of the 2,190 children in the sample for whom teachers indicated their gender, 1,108 were male and 1,082 were female. Only 62 percent (N = 1,861) of the developmental checklists contained the MARSS code. The MARSS codes that were entered appeared to have potential inaccuracies because of the varying numbers of digits recorded.

Comparison of Developmental Assessment at Kindergarten Entrance Year One Pilot Study Results to Year Two Results

The order of proficient ratings by domain is the same in 2002 as it was in 2003, and the percentages for each are very similar, with a five percent decrease in proficiency in 2003 in physical development as the largest change and all others with only a one or two percent decrease (physical development — 62% in 2002, 57% in 2003; personal and social development — 49% in 2002, 47% in 2003; the arts — 48% in 2002, 47% in 2003; language and literacy — 44% in 2002, 43% in 2003; mathematical thinking — 42% in 2002, 40% in 2003) (See Table 4). The in process ratings have increased in each domain by six to eight percent per domain (physical development — 34%, 41%; personal and social development — 38%, 44%; the arts — 42%, 48%; language and literacy — 38%, 46%; mathematical thinking — 44%, 50%). There is a decrease in the percent of not yet ratings in each of the five domains ranging from two to six percent (physical development — 4%, 2%; personal and social development — 13%, 9%; the arts — 10%, 6%; language and literacy — 18%, 12%; mathematical thinking — 13%, 11%). ***In process ratings have increased as proficient and not yet ratings have each decreased slightly.***

Table 4: Comparison of Year One & Year Two Developmental Assessment Results
Year One N = 1,852 • Year Two N = 3,002

Domain	Not Yet				In Process				Proficient			
	2002		2003		2002		2003		2002		2003	
	N	%	N	%	N	%	N	%	N	%	N	%
Physical Development	77	4%	76	2%	629	34%	1,207	41%	1,143	62%	1,702	57%
Personal & Social Development	238	13%	266	9%	708	38%	1,317	44%	899	49%	1,407	47%
The Arts	181	10%	170	6%	779	42%	1,413	48%	885	48%	1,391	47%
Language & Literacy	289	18%	345	12%	704	38%	1,363	46%	819	44%	1,283	43%
Mathematical Thinking	247	13%	318	11%	816	44%	1,489	50%	785	42%	1,186	40%

Table 5. Comparison of Year One and Year Two Proficient Readiness Level by Domain Indicators Ranked by Proficiency Rating

	2003 Proficient Readiness Level		N=3,002	N=1,851
¥ Physical Development	Percent	N	2003 Ranking	2002 Ranking
Performs some self-care tasks independently.	62%	1,841	1	1
Coordinates movements to perform simple tasks.	56%	1,677	2	2
Uses eye-hand coordination to perform tasks.	53%	1,589	3	3
Physical Development Domain Average Score Summary	***57%***	***1,702***		
¥ Personal and Social Development				
Interacts easily with one or more children.	54%	1,625	1	3
Interacts easily with familiar adults.	54%	1,612	2	1
Shows eagerness and curiosity as a learner.	53%	1,587	3	2
Shows empathy and caring for others.	48%	1,445	4	*NI*
Follows simple classroom rules and routines.	48%	1,427	5	5
Manages transitions.	47%	1,393	6	6
Shows some self-direction.	46%	1,370	7	4
Attends to tasks and seeks help when encountering a problem.	42%	1,258	8	7
Seeks adult help when needed to resolve conflicts.	42%	1,253	9	8
Approaches tasks with flexibility and inventiveness.	37%	1,096	10	9
Personal and Social Development Domain Average Score Summary	***47%***	***1,407***		
¥ The Arts				
Participates in group music experiences.	52%	1,546	1	1
Participates in creative movement, dance, and drama.	47%	1,416	2	2
Uses a variety of art materials for tactile experience and exploration.	46%	1,361	3	3
Responds to artistic creations or events.	43%	1,239	4	4
The Arts Domain Average Score Summary	***47%***	***1,391***		
¥ Language and Literacy				
Speaks clearly enough to be understood without contextual clues.	59%	1,758	1	1
Shows appreciation for books and reading.	56%	1,661	2	2
Gains meaning by listening.	48%	1,442	3	4
Comprehends and responds to stories read aloud.	48%	1,442	4	3
Follows two- or three-step directions.	44%	1,319	5	5
Uses expanded vocabularly and language arts for a variety of purposes.	43%	1,279	6	7
Represents ideas and stories through pictures, dictation, and play.	39%	1,157	7	6
Shows beginning understanding of concepts about print.	39%	1,154	8	8
Begins to develop knowledge about letters.	38%	1,140	9	*NI*
Demonstrates phonological awareness.	30%	881	10	10
Uses letter-like shapes, symbols, and letters to convey meaning.	29%	877	11	9
Language and Literacy Domain Average Score Summary	***43%***	***1,283***		
¥ Mathematical Thinking				
Begins to recognize and describe the attributes of shapes.	44%	1,305	1	2
Shows understanding of and uses of several positional words.	44%	1,303	2	1
Shows beginning understanding of number and quantity.	39%	1,175	3	3
Begins to use simple strategies to solve mathematical problems.	32%	959	4	4
Mathematical Thinking Domain Average Score Summary	***40%***	***1,186***		

NI = New Indicator added in 2003

Table 5 compares the Year One and Year Two proficient readiness level by domain indicator ranked within each domain by proficiency rating. ***The ranking numbers illustrate the consistency with which teachers rated kindergartners as proficient by indicator in each domain between Year One and Year Two.*** For example, the order of most to least proficiency by indicator is the same in physical development and the arts and varies by only the reversal of the top two indicators in mathematical thinking. In the other domains of personal and social development and language and literacy, the top and bottom group of indicator rankings follow a very similar pattern. ***Overall, the results from the two years are very consistent with one another.***

Year Two Results on Early Childhood Care and Education Experience

As previously indicated, a parent survey was added to Year Two of the study on the reverse side of the developmental checklist. About 75 percent of the parents of sample children (N = 2,216) completed the parent survey. One of the two sections of the survey focused on the child s early childhood care and education experience in the year prior to kindergarten.

The first survey question asked if the parent had ever participated in a parent education class, either Early Childhood Family Education (ECFE) or another program. ***Over half (57%, N = 1,280) of the respondents indicated they had participated in a parent education class.*** Parents were asked to indicate if their kindergarten child had been cared for on a regular basis by someone other than a parent or attended any child care or early childhood program outside of their home in the past year. ***Respondents reported that 77 percent (N = 1,751) of kindergartners in the sample were cared for on a regular basis by someone other than a parent or attended a child care or early childhood program outside the home in the past year.***

When asked to specify all types of early childhood care and/or education in which their child participated in the past year, parents marked public or private preschool or nursery school most often (71%, N = 1,163) followed by family child care at 51 percent (N = 749) and relative, friend, neighbor, or nanny (in family home or home of caregiver) at 44 percent (N = 616). The least frequently indicated types of care and education were child care center (25%, N = 357) and Head Start (25%,

N = 344) (See Table 6, Chart 7). These types of early childhood care and/or education add up to more than 100 percent because ***more than half (54%, N = 1,001) of sample parents who reported using early childhood care and education indicated that they used more than one type in the previous year.*** Forty-six percent (N = 848) indicated that their child was in only one type of care and/or education the past year, 37 percent (N = 688) in two types, 14 percent in three types (N = 261), and three percent (N = 48) in four types (See Table 7).

Table 6: Type of Early Childhood Care and Education Experience (Duplicated Counts)	Number	Percent
Public or private preschool or nursery school	1,163	71%
Family child care home	749	51%
Relative, friend, neighbor, or nanny	616	44%
Child care center	357	25%
Head Start program	344	25%

Chart 7. Type of Early Childhood Care and Education Experience
(Duplicated Counts)

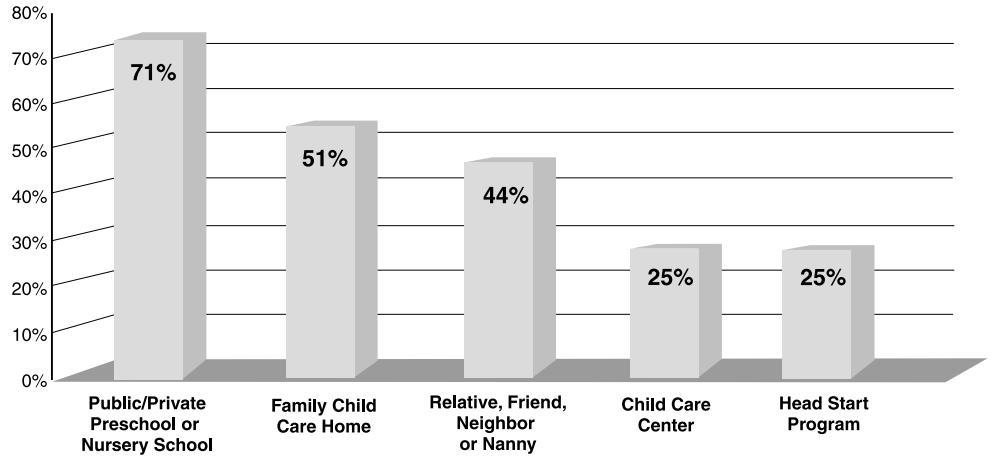
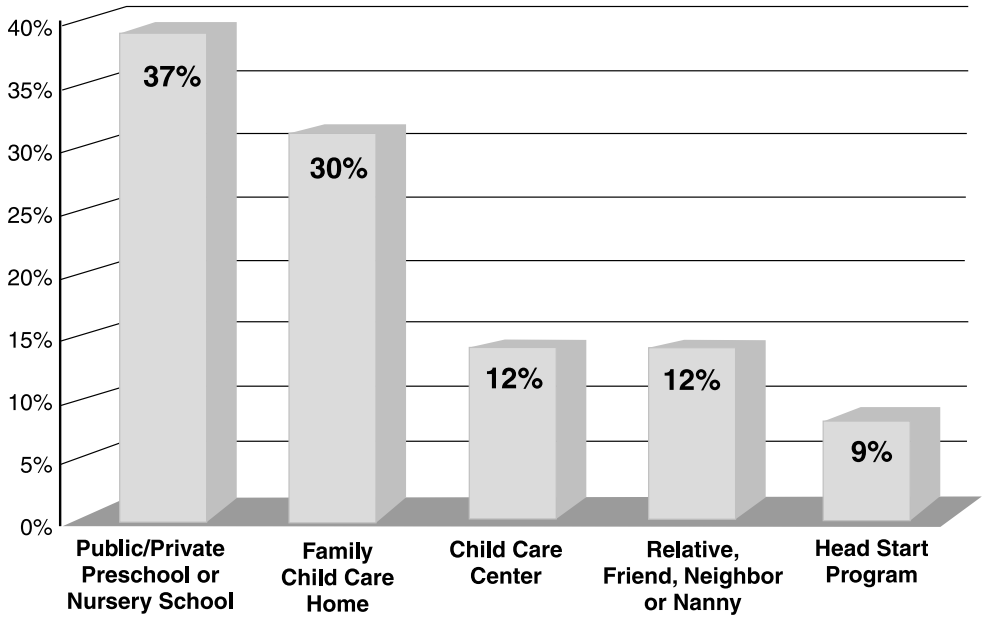


Table 7: Number of Children's Early Childhood Care and Education Experiences in the Past Year		
Number of experiences	Number	Percent
1	858	46%
2	688	37%
3	261	14%
4	48	3%
5	4	<1%
Total	**1,859**	**100%**

Table 8: Type of Early Childhood Care and Education Experience in Which Children Spent the Most Time in the Previous Year	Number	Percent
Public or private preschool or nursery school	509	37%
Family child care home	401	30%
Relative, friend, neighbor, or nanny	160	12%
Child care center	159	12%
Head Start program	128	9%
TOTAL	1,357	100%

Chart 8. Type of Early Childhood Care and Education Experience in Which Children Spent the Most Time in the Previous Year



Parents were also asked to mark the one type of care and/or education that their child spent the most time in other than in their home the year prior to kindergarten. Public or private preschool or nursery school was marked most frequently (37%, N = 509) with family child care home the next most frequent (30%, N = 401). Child care centers (12%, N = 160) and relative, friend, neighbor, or nanny (12%, N = 159) were used by the sample about the same, and Head Start (9%, N = 128) was the least frequent response (See Table 8, Chart 8).

On the parent survey, respondents were asked if they would be interested in receiving a brief follow-up telephone call to talk about their child s early childhood care and education experience with a study staff person. They were asked to record their first name and telephone number if interested. The purpose of the telephone calls was to clarify the nature and accuracy of the parent reports on types of early childhood care and education used by their kindergartner in the past year. It was assumed that many parents might have a different perception than professionals in the field regarding the type of care and/or education in which their child participates. For example, parents might define a child care center or Head Start program as a preschool program.

Follow-up telephone interviews were conducted with 19 parents randomly selected from those who volunteered to be called. The telephone interviews confirmed that there were some likely inaccuracies in the early childhood care and education experiences recorded by parents.

The calls revealed that 13 of the 19 parents who indicated participation in parenting education classes participated in Early Childhood Family Education. Others participated in parent education opportunities including those sponsored by hospitals or their county social services.

Interviews with parents also revealed that some of the reasons for multiple early childhood care and/or education experiences were to accommodate full- or part-time work schedules of one or both parents, to take advantage of a particular preschool program that met for only half-days for only a few days per week regardless of parental employment, or to minimize or maximize the number of hours of school-like settings experienced by young children prior to kindergarten with a combination of preschool and center or family child care. Of the 19 parents interviewed, 11 had their children in at least two child care arrangements at the same time in the year prior to kindergarten. Several parents described patching together two or more care and education arrangements such as a child care center or family child care home with a preschool or Head Start program that met only part-day or only a few days per week. These findings are comparable to the 1999 Minnesota Household Child Care Survey (Chase & Shelton, 2001), which found that 48 percent of children in the study were cared for in more than one arrangement during a given week. Almost all parents expressed a desire to have their child in some school-like setting for some portion of the year prior to kindergarten to get them ready for school socially and emotionally.

Year Two Results on Family Information

The second section of the parent survey focused on family information. Respondents were first asked to indicate whether they were the child s mother, father, or another person. Approximately 85 percent (N = 1,872) of survey respondents were the child s mother (See Table 9).

Table 9: Relationship of Respondent to Kindergartner	Number	Percent
Mother	1,872	85%
Father	313	14%
Other	31	1%
TOTAL	2,216	100%

Parents were asked to mark the highest level of school they had completed. The majority of respondents (76%, N = 1,698) had some college beyond high school or a degree (trade school or some college beyond high school — 34%, N = 761; Associate degree — 11%, N = 250; Bachelor s degree — 22%, N = 484; graduate or professional school degree — 9%, N = 203). Nineteen percent (N = 427) had high school diplomas or a GED, and 4 percent had less than a high school diploma/GED (some high school — 2%, N = 52; 8th grade or less — 2%, N = 36) (See Table 10).

Table 10: Parent Education Level	Number	Percent
8th grade or less	36	2%
Some high school	52	2%
High school diploma/GED	427	19%
Trade school or some college beyond high school	761	34%
Associate degree	250	11%
Bachelor's degree	484	22%
Graduate of professional school degree	203	9%
TOTAL	2,213	100%

Families were asked to report their household s total yearly income before taxes. Just over half of the respondents (51%, N = 1,062) reported yearly incomes of $55,000 or less with 28 percent (N = 577) reporting yearly incomes of $35,000 or less and 23 percent (N = 485) reporting yearly income of $35,001-$55,000. Twenty-three percent (N = 477) reported yearly incomes between $55,001-$75,000, 17 percent (N = 352) reported yearly incomes between $75,001-$105,000, and 9 percent (N = 196) reported yearly incomes of $105,001 or more (See Table 11).

Table 11. Household Income	Number	Percent
$ 0 - $ 35,000	577	28%
$ 35,001 - $ 55,000	485	23%
$ 55,001 - $ 75,000	477	23%
$ 75,001 - $105,000	352	17%
$105,001 or more	196	9%
Total	**2,087**	**100%**

Parents were asked to indicate the race/ethnicity of their kindergartner. They could indicate more than one race or ethnic group. The race/ethnicity most often noted was white/Caucasian (86%, N = 1,948). Following that, black/African/African American was 6 percent (N = 136), Asian/Native Hawaiian or other Pacific Islander and Hispanic or Latino were 5 percent (N = 121, N = 115, respectively), American Indian/ Alaskan Native was 2 percent (N = 51), and other was 1 percent (N = 27) (See Table 12). One hundred and ten children were reported to be of more than one race or ethnic group by their parents. Most of these children (85%, N = 94)) were reported to be of two races or ethnic groups, 13 percent (N = 14) reported three races or ethnic groups, and 2 percent (N = 2) reported four races or ethnic groups (See Table 13).

Table 12. Race or Ethnic Group (Duplicated Counts)	Number	Percent
White/Caucasian	1,948	86%
Black/African/African American	136	6%
Asian/Native Hawaiian or other Pacific Islander	121	5%
Hispanic or Latino	115	5%
American Indian/Alaskan Native	51	2%
Other	27	1%
TOTAL	2,398	105%

Table 13. Number of Races or Ethnic Groups of Kindergartners	Number	Percent
2	94	85%
3	14	13%
4	2	2%
TOTAL	110	100%

Most families in the sample reported speaking English most frequently at home (94%, N = 2,124). Three percent spoke Hmong most frequently (N = 57) followed by Spanish at 2 percent (N = 54), other languages at 1% (N = 19), four families reporting speaking Somali, and one family reporting speaking Russian most frequently (See Table 14). The relatively low percentage of non-English speaking families in the parent survey sample reflects that non-English speaking families are likely underrepresented in the sample because the parent survey was not translated into languages other than English due to budget constraints.

Table 14. Language Spoken Most Often at Home	Number	Percent
English	2,124	94%
Hmong	57	3%
Spanish	54	2%
Other	19	1%
Somali	4	<1%
Russian	1	<1%
TOTAL	2,259	100%

Parents were asked if their kindergartner received special education services through an Individual Education Plan (IEP) or an Individual Interagency Intervention Plan (IIIP). Seven percent of kindergartners (N = 157) in the sample receive special education services (See Table 15).

Table 15. Receipt of Special Education Through an IEP or IIIP	Number	Percent
YES	157	7%
NO	2,109	93%
TOTAL	2,266	100%

Relationship of Year Two Developmental Assessment Results to Gender Results

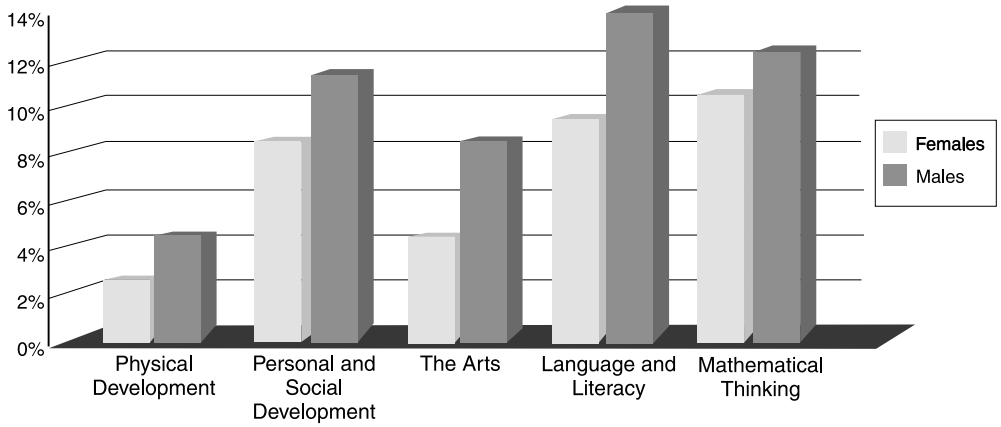
As indicated previously, of the 2,190 teachers who marked the gender of each student on the developmental checklist, teachers reported that 1,108 of the sample children were male and 1,082 were female. The developmental assessment data results in the three categories of readiness levels in the five developmental domains studied are reported below in relation to gender (See Table 16). Chart 9 shows the developmental assessment data results in the not yet category of readiness in the five domains in relation to gender. In the proficiency category of readiness, in all five domains the females in the study were rated as more proficient than the males, ranging from 2 — 12 percent more proficient depending upon the domain (physical development: females = 62%, N = 670, males = 54%, N = 594; personal and social development: females = 52%, N = 558, males = 42%, N = 465; the arts: females = 54%, N = 578, males = 42%, N = 462; language and literacy: females = 47%, N = 508, males = 40%, N = 447; mathematical thinking: females = 43%, N = 459, males = 41%, N = 453). In all five domains the males showed a higher percent in the not yet category of readiness than the females, ranging from a 2 — 5 percent difference depending upon the domain (physical development: males = 4%, N = 41, females = 2%, N = 20; personal and social development: males = 11%, N = 120, females = 8%, N = 81; the arts: males = 8%, N = 89, females = 4%, N = 44; language and literacy: males = 14%,

N = 152, females = 9%, N = 101; mathematical thinking: males = 12%, N = 132, females = 10%, N = 103). ***This finding is consistent with the research on gender and school achievement. Girls are usually ahead of boys on important school readiness variables*** (Coley, 2002; Wertheimer & Croan, 2003; Zill & West, 2000).

Table 16: Domain Averages for Children by Gender
Females = 1,082 • Males = 1,108

Domain	Not Yet				In Process				Proficient			
	Females		Males		Females		Males		Females		Males	
	N	%	N	%	N	%	N	%	N	%	N	%
Physical Development	20	2%	41	4%	385	36%	469	43%	670	62%	594	54%
Personal & Social Development	81	8%	120	11%	438	41%	519	47%	558	52%	465	42%
The Arts	44	4%	89	8%	448	42%	549	50%	578	54%	462	42%
Language & Literacy	101	9%	152	14%	467	43%	507	46%	508	47%	447	40%
Mathematical Thinking	103	10%	132	12%	516	48%	520	47%	459	43%	453	41%

Chart 9. Domain Averages for Children Rated "Not Yet" by Gender



Relationship of Year Two Developmental Assessment Results to Family Information Results

The developmental assessment data results in the not yet category of readiness levels in the five developmental domains studied are reported below in relation to one or two selected family information variables that research has shown to be related to lower levels of school readiness and achievement (Coley, 2002; Gershoff, 2003; Hart & Risley, 1995; Lee & Burkam, 2002; National Research Council & Institute of Medicine, 2000; Wertheimer & Croan, 2003; Zill & West, 2000). Because of interest in improving the school readiness of children not yet able to do the skills, areas of knowledge, or specific sets of behaviors or accomplishments expected of them as they enter kindergarten, it is of particular interest to examine categories of family information where the not yet percentages and numbers of kindergartners are higher than in other family information categories. The following tables and charts provide the data on these relationships.

Developmental Assessment Results By Parent Education Level

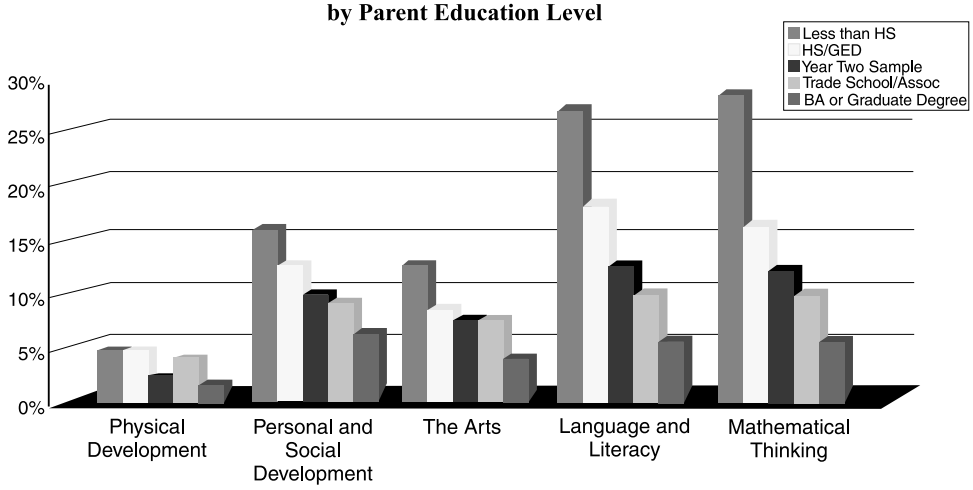
The data on the relationship between developmental assessment by domain in the not yet category of readiness levels and parent education level are reported as less than high school (N = 88), high school diploma/GED (N = 427), trade school or some college beyond high school/ Associate degree (N = 1,011), and Bachelor s or graduate or professional school degree (N = 687). In all five developmental domains, the percentage of kindergartners not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments is highest in the lower two educational levels of sample parents compared to the two higher education levels, ranging from a two — five percent difference depending upon the domain (mathematical thinking: 27%, N = 24 and 15%, N = 64 in the two lower education levels compared to 9%, N = 87 and 5%, N = 37 in the two higher education levels; language and literacy: 26%, N = 22 and 17%, N = 71 in the two lower education levels compared to 10%, N = 101 and 5%, N = 37 in the two higher education levels; the arts: 12%, N = 11 and 7%, N = 28 in the two lower education levels compared to 6%, N = 59 and 3%, N = 22 in the two higher education levels; personal and social development: 15%, N = 13 and 12%, N = 49 in the two lower education levels compared to 8%, N = 81 and 5%, N = 36 in the two higher education levels; physical development: 4%, N = 3 and 17, respectively, in the two lower education levels compared to 3%, N = 27 and 1%, N = 7

in the two higher education levels) (See Table 17, Chart 10). ***In all domains, the students of parents with the least amount of education (less than high school) were three times as likely or more to have a not yet rating than the students of parents with the most education (Bachelor s or graduate or professional school degree). These differences are particularly pronounced in mathematical thinking and language and literacy where differences in percentage of not yet ratings are over five times greater for the children of parents with the least amount of education compared to the children of parents with the most education.***

Table 17: Domain Averages for Children Rated "Not Yet" by Parent Education Level

	Physical Development		Personal & Social Development		The Arts		Language & Literacy		Mathematical Thinking	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Less than HS, N=88	3	4%	13	15%	11	12%	22	26%	24	27%
HS/GED, N=427	17	4%	49	12%	28	7%	71	17%	64	15%
YEAR TWO SAMPLE, N=3,002	**76**	**2%**	**266**	**9%**	**170**	**6%**	**345**	**12%**	**318**	**11%**
Trade School/Associate Degree, N=1,011	27	3%	81	8%	59	6%	101	10%	87	9%
BA or Grad Degree, N=687	7	1%	36	5%	22	3%	37	5%	37	5%

Chart 10. Domain Averages for Children Rated "Not Yet" by Parent Education Level



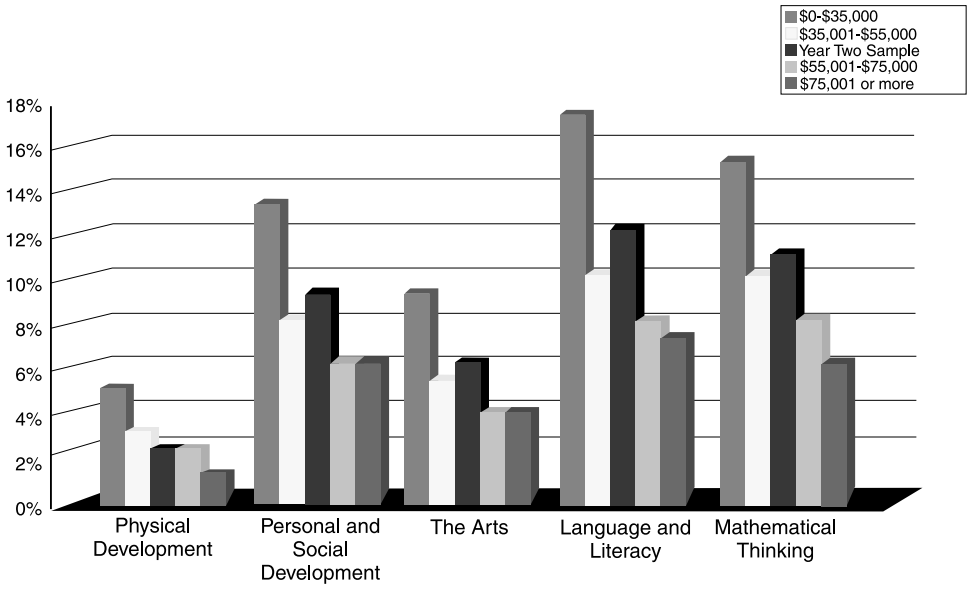
Developmental Assessment Results By Household Income

The data on the relationship between developmental assessment by domain in the not yet category of readiness levels and total household yearly income before taxes are reported as income $0-$35,000 (N = 577), income $35,001-$55,000 (N = 485), income $55,001-$75,000 (N = 477), and income $75,001 or more (N = 548). In all five developmental domains, the percentage of kindergartens not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments is highest in the two lower income categories as compared to the two higher income categories (mathematical thinking: 15%, N = 85 and 10%, N = 50 in the two lower income categories compared to 8%, N = 37 and 6%, N = 33 in the two higher income categories; language and literacy: 17%, N = 99 and 10%, N = 50 in the two lower income categories compared to 8%, N = 39 and 7%, N = 36 in the two higher income categories; the arts: 9%, N = 50 and 5%, N = 24 in the two lower income categories compared to 4%, N = 21 and 24, respectively, in the two higher income categories; personal and social development: 13%, N = 72 and 8%, N = 41 in the two lower income categories compared to 6%, N = 29 and 33, respectively, in the two higher income categories; physical development: 5%, N = 26 and 3%, N = 14 in the two lower income categories compared to 2%, N = 9 and 1%, N = 5 in the two higher income categories) (See Table 18, Chart 11). ***In all domains, the students in the lowest of the four income categories ($0-$35,000) were over twice as likely to have a not yet rating than the students in the highest of the four income categories ($75,001 or more).***

Table 18: Domain Averages for Children Rated "Not Yet" by Household Income

	Physical Development		Personal & Social Development		The Arts		Language & Literacy		Mathematical Thinking	
	N	%	N	%	N	%	N	%	N	%
$0-$35,000, N=577	26	5%	72	13%	50	9%	99	17%	85	15%
$35,001-$55,000, N=485	14	3%	41	8%	24	5%	50	10%	50	10%
YEAR TWO SAMPLE, N=3,002	**76**	**2%**	**266**	**9%**	**170**	**6%**	**345**	**12%**	**318**	**11%**
$55,001-$75,000, N=477	9	2%	29	6%	21	4%	39	8%	37	8%
$75,001 or more, N=548	5	1%	33	6%	24	4%	36	7%	33	6%

Chart 11. Domain Averages for Children Rated "Not Yet" by Household Income



Developmental Assessment Results By Kindergartner Race/Ethnicity

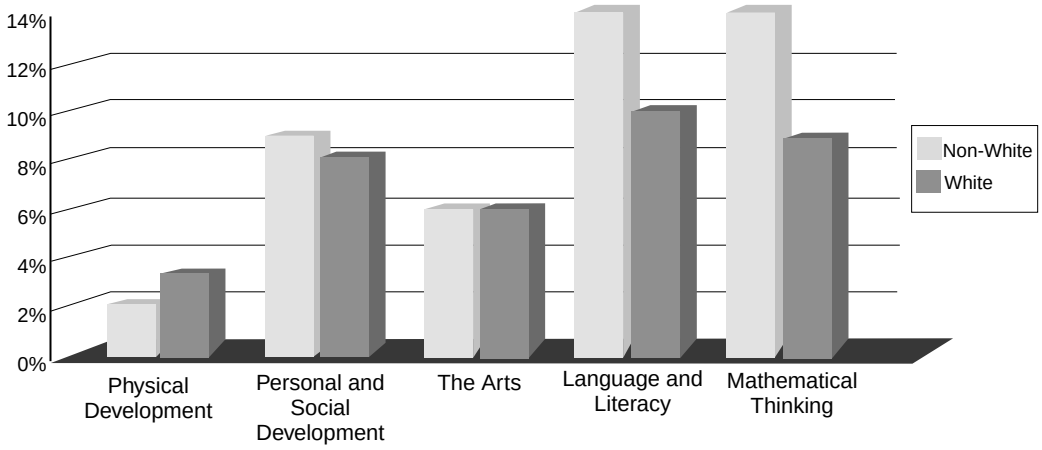
The data on the relationship between developmental assessment by domain in the not yet category of readiness levels and race/ethnicity are reported as white and non-white with 85 percent (N = 1,845) of the parent respondents indicating white/Caucasian and 15 percent (N = 419) reporting other races/ethnicities. In the domains of language and literacy and mathematical thinking, the non-white group showed 14 percent as not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments (N = 60, N = 60, respectively). Ten percent (N = 180) in language and literacy and 9 percent in mathematical thinking (N = 158) in the white group of students were rated as not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments. There was little difference between the two categories of race/ethnicity in the other three domains (in the arts non-white and white are both 6%, N = 23 and 104, respectively; in personal and social

development non-white = 9%, N = 37 and white = 8%, N = 147; in physical development non-white = 2%, N = 8 and white = 3%, N = 48) (See Table 19, Chart 12). ***Race or ethnicity does not appear to be as much of a factor in school readiness indicator ratings as parent education level and family income. Not yet proficiency ratings were higher in language and literacy and mathematical thinking in the sample of non-white versus white kindergartners, but there was little difference by race in the other three domains of personal and social development, the arts, and physical development.***

Table 19. Domain Averages for Children Rated "Not Yet" by Race/Ethnicity
(White and Non-White)

	Physical Development		Personal & Social Development		The Arts		Language & Literacy		Mathematical Thinking	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
White, N = 1,845	48	3%	147	8%	104	6%	180	10%	158	9%
YEAR TWO SAMPLE, N=3,002	**76**	**2%**	**266**	**9%**	**170**	**6%**	**345**	**12%**	**318**	**11%**
Non-White, N = 419	8	2%	37	9%	23	6%	60	14%	60	14%

Chart 12. Domain Averages for Children Rated "Not Yet" by Race/Ethnicity (White and Non-White)



Developmental Assessment Results By Household Income and Parent Education Level

¥ Lower Income, Lower Parent Education Level Compared to Higher Income, Higher Parent Education Level

The data on the relationship between developmental assessment by domain in the not yet category of readiness in the lower household income category of $0-$55,000 and upper household income category of $55,000 or more and the lower parent education level (8th grade or less than a high school education or a high school diploma/GED) and the higher parent education level (trade school or some college beyond high school/Associate degrees and Bachelor s and graduate degrees) are reported in Table 20 (lower income level and less education, N = 384; lower income level and more education, N = 657; upper income level and less education, N = 89; upper income level and more education, N = 929). ***In all of the domains, the children with lower family incomes and parents with lower education levels had a higher percentage not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments expected of them as they enter kindergarten than children with higher family incomes and parents with higher education levels*** (mathematical thinking: lower income, less education = 19% (N = 71) not yet ratings compared to 6% (N = 58) not yet ratings for children with higher family incomes and parents with higher education levels; language and literacy: lower income, less education = 20% (N = 75) not yet ratings compared to 7% (N = 62) not yet ratings for children with higher family incomes and parents with higher education levels; the arts: lower income, less education = 9% (N = 33) not yet ratings compared to 4% (N = 39) not yet ratings for children with higher family incomes and parents with higher education levels; personal and social development: lower family income, less education = 13% (N = 51) not yet ratings compared to 6% (N = 53) not yet ratings for children with higher family incomes and parents with higher education levels; physical development: lower income, less education = 5% (N = 18) not yet ratings compared to 1% (N =11) not yet ratings for children with higher family incomes and parents with higher education levels (See Table 20, Chart 13). ***Sample children from lower income families and with parents with less education were two — three times more likely to be rated not yet in all domains than children from higher income families and with parents with more education.***

¥ Lower Income, Lower Parent Education Level Compared to Lower Income, Higher Parent Education Level

When comparing the relationship of the lower income, lower parent education level group to the lower income, higher parent education level group, those children with lower family incomes and parents with higher education levels had fewer not yet ratings in all domains than children with lower family incomes and parents with lower education levels (mathematical thinking: lower income, less education = 19% not yet ratings compared to 9% not yet ratings for children with lower family incomes and parents with higher education levels; language and literacy: lower income, less education = 20% not yet ratings compared to 11% not yet ratings for children with lower family incomes and parents with higher education levels; the arts: lower income, less education = 9% not yet ratings compared to 6% not yet ratings for children with lower family incomes and parents with higher education levels; personal and social development: lower income, less education = 13% not yet ratings compared to 9% not yet ratings for children with lower family incomes and parents with higher education levels; physical development: lower income, less education = 5% not yet ratings compared to 3% not yet ratings for children with lower family incomes and parents with higher education levels) (See Table 20, Chart 13). ***This implies that the level of a parent s education might act as a buffer to lower income status with regard to school readiness.***

¥ Higher Income, Lower Parent Education Level Compared to Higher Income, Higher Parent Education Level

When comparing the relationship of the higher income, lower parent education level group to the higher income, higher parent education level group, those children with higher family incomes and lower parent education levels had more not yet ratings in all domains than children with higher family incomes and parents with higher education levels (mathematical thinking: higher income, less education = 11% not yet ratings compared to 6% not yet ratings for children with higher family incomes and parents with higher education levels; language and literacy: higher income, less education = 12% not yet ratings compared to 7% not yet ratings for children with higher family incomes and parents with higher education levels; the arts: higher income, less education = 5% not yet ratings compared to 4% not yet ratings for children with higher family incomes and parents with higher education levels; per-

sonal and social development: higher income, less education = 10% not yet ratings compared to 6% not yet ratings for children with higher family incomes and parents with higher education levels; physical development: higher income, less education = 3% not yet ratings compared to 1% not yet ratings for children with higher family incomes and parents with higher education levels) (See Table 20, Chart 13). ***This implies that a higher income level may not be enough to offset the impact of a parent s lower education level in regard to child school readiness.***

¥ Lower Income, Lower Parent Education Level Compared to Higher Income, Lower Parent Education Level

At the same time, when examining the relationship between the lower income, lower parent education level group and the higher income, lower parent education level group, in all domains children were rated not yet less frequently when the family income was higher in spite of the lower education level of parents in both groups (mathematical thinking: lower income, less education = 19% not yet ratings compared to 11% not yet ratings for children with higher family incomes and parents with lower education levels; language and literacy: lower income, less education = 20% not yet ratings compared to 12% not yet ratings for children with higher family incomes and parents with lower education levels; the arts: lower income, less education = 9% not yet ratings compared to 5% not yet ratings for children with higher family incomes and parents with lower education levels; personal and social development: lower income, less education = 13% not yet ratings compared to 10% not yet ratings for children with higher family incomes and parents with lower education levels; physical development: lower income, less education = 5% not yet ratings compared to 3% not yet ratings for children with higher family incomes and parents with lower education levels) (See Table 20, Chart 13). ***This implies that higher incomes can reduce the impact of parents lower education levels.***

¥ Lower Income, Higher Parent Education Level Compared to Higher Income, Higher Parent Education Level

When comparing the relationship of the lower income, higher parent education level group to the higher income, higher parent education level group, those children with higher family incomes and parents with higher education levels had fewer not yet ratings in all domains than children with lower family incomes and parents with higher edu-

cation levels (mathematical thinking: lower income, more education = 9% not yet ratings compared to 6% not yet ratings for children with higher family incomes and parents with higher education levels; language and literacy: lower income, more education = 11% not yet ratings compared to 7% not yet ratings for children with higher family incomes and parents with higher education levels; the arts: lower income, more education = 6% not yet ratings compared to 4% not yet ratings for children with higher family incomes and parents with higher education levels; personal and social development: lower income, more education = 9% not yet ratings compared to 6% not yet ratings for children with higher family incomes and parents with higher education levels; physical development: lower income, more education = 3% not yet ratings compared to 1% not yet ratings for children with higher family incomes and parents with higher education levels) (See Table 20, Chart 13). ***This implies that a higher income can increase the child s school readiness ratings when parents have higher education levels.***

¥ Lower Income, Higher Parent Education Level Compared to Higher Income, Lower Parent Education Level

When comparing the relationship of the lower income, higher parent education level group to the higher income, lower parent education level group, results are mixed. In mathematical thinking, language and literacy, and personal and social development, children from higher income families with parents with lower education levels showed more not yet ratings than those children with lower family incomes and parents with higher education levels (mathematical thinking: higher family income, lower parent education level = 11% not yet ratings compared to 9% not yet ratings for children with lower family incomes and parents with higher education levels; language and literacy: higher income, lower parent education level = 12% not yet ratings compared to 11% not yet ratings for children with lower family incomes and parents with higher education levels; personal and social development: higher income, lower parent education level = 10% not yet ratings compared to 9% not yet ratings for children with lower family incomes and parents with higher education levels). ***In physical development, both higher family income, lower parent education level and lower family income, higher parent education level groups of children are at 3 percent. In the arts, children from higher income families with parents with lower education levels showed one percent less not yet ratings (5%) than those children with lower family incomes and parents with***

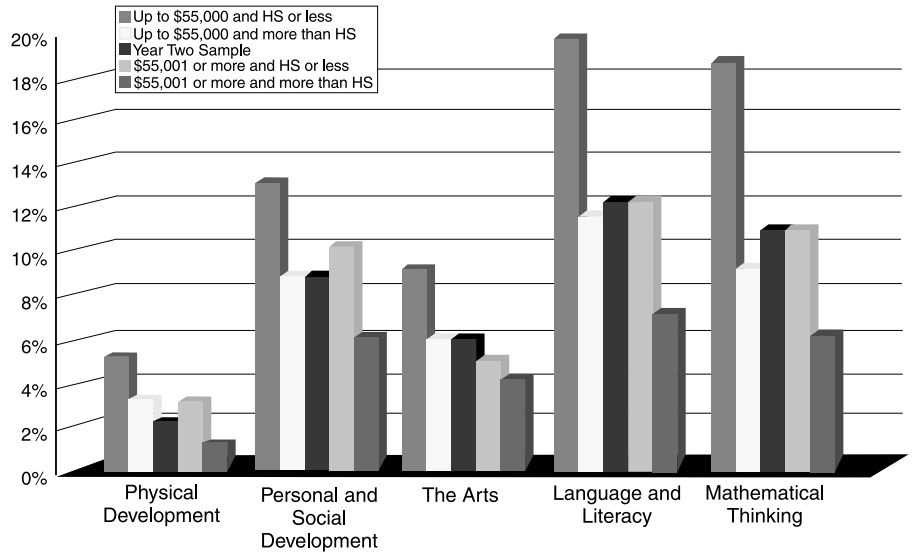
higher education levels (6%) (See Table 20, Chart 13). ***This implies that in some domains a higher income level may not be enough to offset the impact of a parent s lower education level in regard to child school readiness, but not in all.***

The information about developmental assessment results in relation to household income and parent education level are all only suggestive findings worthy of further investigation regarding the interplay of family income and parent education level on children s school readiness. Both appear to make a difference in school readiness knowledge and skills.

Table 20: Domain Averages for Children Rated "Not Yet" by Household Income and Parent Education Level

	Physical Development		Personal & Social Development		The Arts		Language & Literacy		Mathematical Thinking	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Income up to $55,000 and High School or less, N=384	18	5%	51	13%	33	9%	75	20%	71	19%
Income up to $55,000 and more than High School, N=657	22	3%	58	9%	37	6%	70	11%	60	9%
YEAR TWO SAMPLE, N=3,002	**76**	**2%**	**266**	**9%**	**170**	**6%**	**345**	**12%**	**318**	**11%**
Income $55,001 or more and High School or less, N=89	2	3%	9	10%	5	5%	11	12%	10	11%
Income $55,001 or more and more than High School, N=929	11	1%	53	6%	39	4%	62	7%	58	6%

Chart 13. Domain Averages for Children Rated "Not Yet" by Household Income and Parent Education Level



Developmental Assessment Results By Household Income and Kindergartner Race/Ethnicity

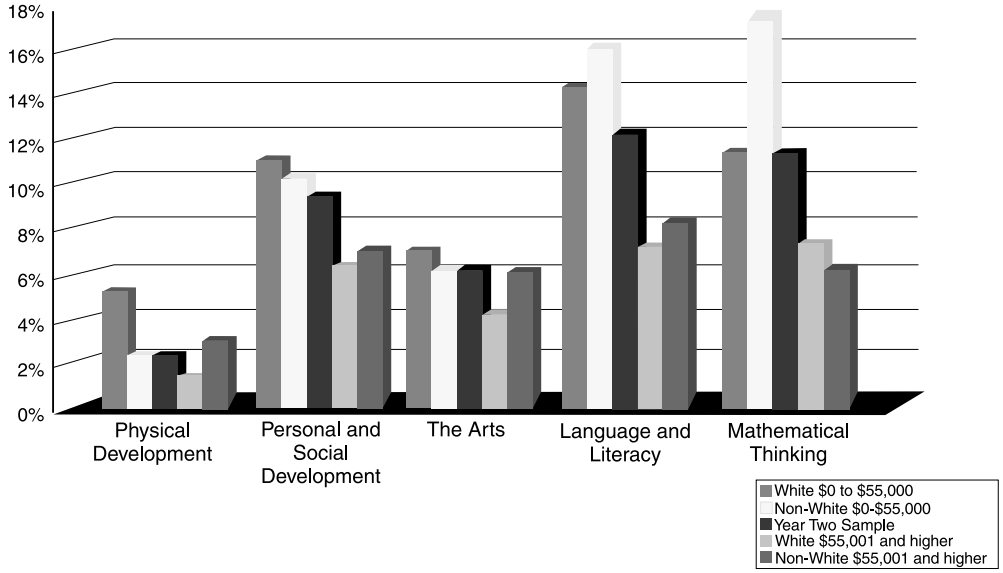
The data on the relationship between developmental assessment by domain in the not yet category of readiness levels in two levels of total household yearly income before taxes categories of $0-$55,000 and $55,001 or more and kindergartner race/ethnicity as white or non-white are reported in Table 21 (lower income level white N = 764, lower income level non-white N = 293; upper income level white N = 931, upper income level non-white N = 91). In mathematical thinking in the lower income category there are 11 percent (N = 85) white and 17 percent (N = 49) non-white with not yet proficiency ratings compared to 7 percent (N = 65) white and 6 percent (N = 6) non-white at the upper income level. In language and literacy in the lower income category there are 14 percent (N = 103) white and 16 percent (N = 46) non-white with not yet proficiency ratings compared to 7 percent (N = 67) white and 8 percent (N = 8) non-white at the upper income level. In the arts in the lower income category there are 7 percent (N = 57) white and 6 percent (N = 16) non-white with not yet proficiency ratings compared to 4 percent (N = 39) white and 6 percent (N = 5) non-white at the upper income level. In personal and social development in the lower income category there are 11 percent (N = 83) white and 10 percent (N = 29) non-white compared to 6 percent (N = 57) white and 7 percent (N = 6) non-white at the upper income level. In physical development in the lower income category there are 5 percent (N = 35) white and 2 percent (N = 5) non-white with not yet proficiency ratings compared to 1 percent (N = 12) white and 3 percent (N = 2) non-white at the upper income level. ***In mathematical thinking the lower income non-white group shows more not yet ratings (17%) than the white lower income group (11%). There is less difference in language and literacy between the lower income non-white group (16%) and the lower income white group (14%). In the other three domains the lower income not yet ratings are higher in the white group than the non-white group*** (the arts: 7% white, 6% non-white; personal and social development: 11% white, 10% non-white; physical development: 5% white, 2% non-white). ***There are only 1-2 percent differences in the not yet ratings of the higher income white and non-white children in each of the five domains*** (mathematical thinking: 7% white, 6% non-white; language and literacy: 7% white, 8% non-white; the arts: 4% white, 6% non-white; personal and social development: 6% white, 7% non-white; physical development: 1% white, 3%

non-white) (See Table 21, Chart 14). ***These results imply that income is more of a factor than race or ethnic group in children s school readiness at lower income levels, and race is not a differentiating factor at higher income levels.***

Table 21: Domain Averages for Children Rated "Not Yet" by Household Income and Race/Ethnicity (White and Non-White)

	Physical Development		Personal & Social Development		The Arts		Language & Literacy		Mathematical Thinking	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
$0 - $55,000 & White, N=764	35	5%	83	11%	57	7%	103	14%	85	11%
$0 - $55,000 & Non-White, N=293	5	2%	29	10%	16	6%	46	16%	49	17%
YEAR TWO SAMPLE, N=3,002	**76**	**2%**	**266**	**9%**	**170**	**6%**	**345**	**12%**	**318**	**11%**
$55,001 and higher & White, N=931	12	1%	57	6%	39	4%	67	7%	65	7%
$55,001 and higher & Non-White, N=91	2	3%	6	7%	5	6%	8	8%	6	6%

Chart 14. Domain Averages for Children Rated "Not Yet" by Household Income and Race/Ethnicity (White and Non-White)



Principal and Teacher Survey Results

As in Year One, the success of the study rested with the willingness of school principals and kindergarten teachers to participate. The process of implementing the study continued to be an area of focus. As part of this, participating school principals and kindergarten teachers were again given surveys to complete regarding their decision to participate, barriers to participation, and the associated workload and benefits. The following information is based upon the response of 11 principals (21%) and 73 kindergarten teachers (57%).

Principal Perspectives

As was the case in Year One, the most common way that principals made the decision to participate was to consult with kindergarten teachers. Most principals did not indicate there were significant barriers to participation in the study. The barriers they reported were related to issues such as availability of training for any of their teachers not trained in the Work Sampling System, their kindergarten teachers workloads, and prior commitments to similar initiatives. In order to overcome some of these barriers, some principals provided additional staff time and pay to their teachers or found other ways to relieve them of other expectations in order to allow them to focus on the study assessment. There was no compensation to schools or to teachers for study participation other than the books given to parents who did the survey. Principals indicated that it would be helpful to allow for some compensation to staff for the additional work expected. When asked what they would tell other elementary school principals considering participation, most were positive and indicated, for example, that they would encourage participation because of the additional data made available. Some wanted to see their school building data before they could assess local benefits. One principal stated, I think it is important to participate in the initiative for state data collection reasons as well as with the overall goal of improving early childhood services.

Teacher Perspectives

The most common challenge of the study for kindergarten teachers continued to be the increased time spent on observing, documenting, and rating children s behaviors in the first weeks of school. Just under half (49%) of the kindergarten teachers completing the survey indicated that the workload outweighed the benefits while over 28 percent thought that the benefits were about equal to the workload. A little over half of the teachers (53%) indicated that the Work Sampling System checklist was not helpful to them, and 37 percent found it to be helpful. Most of the teachers did not encounter difficulty having parents complete the parent survey. Parent confusion as to what to do, lack of time to do it at open houses, language barriers, and parent concerns about confidentiality were the most commonly cited issues with the parent survey.

About half of the teachers (49%) indicated interest in using a web-based developmental checklist for future years of the study. The teachers reported many ways in which they used the checklist information in their instruction including identifying children s needs earlier than usual in order to target classroom instruction, for Title I assessment, for portfolios, to guide lesson plan development, and for providing information to parents. Teachers provided many suggestions and recommendations for improving the study process including allowing more time for completion of the checklists given the demands of the start of a school year, getting study materials directly to the teachers and communicating with them as soon as possible, offering the parent survey in multiple languages, and compensating them or providing some reward for their time.

Limitations

Many of the limitations of the *Minnesota School Readiness Year Two Study: Developmental Assessment at Kindergarten Entrance* are reflections of the resources available, including having limited staff to accomplish study tasks with a larger sample.

The larger sample of kindergartners than the previous year (3,002 versus 1,851) alleviated most of the issues of constructing a representative sample, but the challenge of contacting school principals and their uncertainty as to participation in the study until late in the summer continued to be a challenge. Invitations to principals began in May and continued through August. In the spring, principals were often unable to commit to participation at that time because of uncertainty over kindergarten teachers and/or their placement. A number of elementary schools were closed over the summer and principals were not employed, thus making it difficult to contact them until August. Because the sample was again not completed until late August and kindergarten teachers do not typically begin working until the week before school starts, the time to prepare kindergarten teachers for all details of the study was limited. Electronic mail communication directly with kindergarten teachers was the most successful way to communicate with them once they joined the sample.

A parent survey was added in Year Two that required giving more information to and answering more questions from principals and teachers as to parent completion of it. Also, copies of the book *Winning Ways to Learn Ages 6, 7 & 8: 600 Great Ideas for Children* were mailed to participating elementary schools for them to give to parents for their completion of the survey. Principals, teachers, and parents expressed appreciation for the book, but the logistics of getting the correct number of books needed to each school added to study efforts.

The parent survey contained questions for parents related to sample children s early childhood care and education experiences in the year prior to kindergarten. It was assumed that many parents might have a different perception than professionals in the field as to the type of care and/or education in which their child participates. A small number of follow-up telephone interviews to study parents confirmed that there were some likely inaccuracies in the early childhood care and education experiences recorded by parents based on this assumption. However, the information collected provided a beginning picture of this important contributor to children s school readiness.

The parent survey also contained family information questions including those related to parent education level, yearly household income before taxes, and race or ethnic group of kindergartners. Some parents were reluctant to complete the question related to family income. When relating the developmental assessment results to the different categories within these three variables, some of the group sizes were very small and, thus, need to be interpreted with caution. Over-sampling children in some of these categories and other more sophisticated sampling design procedures would eliminate this issue. About 75 percent of the parents completed the parent survey.

Only 62 percent of the developmental checklists had the MARSS code filled in by the teacher or another school staff person. As previously indicated, the MARSS codes that were entered appeared to have potential inaccuracies because of the varying numbers of digits recorded. This limited the usefulness of these code numbers as recorded on the checklists and raises the issue of finding other ways to collect this information on the children studied.

The Minnesota School Readiness Year Two Study of children s developmental assessment at kindergarten entrance in the fall of 2003 again gives a picture of the development of a representative sample of Minnesota kindergarten children in the first weeks of school. The data yield information on 32 indicators in five domains of development — personal and social, language and literacy, mathematical thinking, the arts, and physical development — that can be compared to the baseline data on 30 of the indicators obtained in the Year One pilot study. The Year Two data also provide information reported by parents on the early childhood care and education experiences of sample children in the year prior to kindergarten and family information on parents highest level of school completed, household total yearly income before taxes, race/ethnicity of the kindergartner, language spoken most at home, and child participation in special education. These results will be useful to public school administrators and teachers and early childhood care and education teachers, providers, and administrators as well as parents, policymakers, community members, and the general public as they work to improve children s school readiness and school success.

About Child Assessment Results

1. As in the fall of 2002, children in the fall of 2003 again entered kindergarten with a range of skills, knowledge, behaviors, and accomplishments. Study results reflect the great variability in young children s knowledge and skills as evident in observing any group of young children and borne out by research. It is not appropriate to expect that all children will come to school with the same level of skills and knowledge in all areas of development.

In all of the developmental domains assessed in the study, a certain percentage of children entering kindergarten did not yet show the indicators of focus. Based on findings from similar studies in other states and national studies, these children are more likely than children who can perform the indicators to live in poverty or experience other risk factors making them vulnerable for school failure. Early childhood teachers, providers, and administrators; schools; policymakers; and community members have a particular responsibility to focus special attention and resources on these children if they are to catch up to their peers and achieve in school.

2. Parent education level and family income appear to be related to readiness level. In all five developmental domains assessed — language and literacy, mathematical thinking, personal and social development, the arts, and physical development — the percentage of kindergartners not yet showing the skills, areas of knowledge, or specific sets of behaviors or accomplishments is highest for the children of parents with the least education and in the lower income levels. Race or ethnic group does not appear to be as much of a factor. Not yet proficiency ratings were somewhat higher in language and literacy and mathematical thinking in the sample of non-white versus white kindergartners, but there was little difference by race in the other three domains of personal and social development, the arts, and physical development. When developmental results were examined by looking at their relationship to both race/ethnicity and household income, income was the factor that appeared to be more consistently related to children s readiness ratings. The results on parent education level and family income are consistent with research showing the impact of poverty and parent educational level on children s school readiness and school success (Coley, 2002; Gershoff, 2003; Hart & Risley, 1995; Lee & Burkam, 2002; National Research Council & Institute of Medicine, 2000; Wertheimer & Croan, 2003; Zill & West, 2000).

3. Most children are cared for on a regular basis by someone other than a parent or attend a child care or early childhood program outside of their home and do so in multiple settings. Sample parents reported that 77 percent of their kindergartners were cared for on a regular basis by someone other than a parent or attended a child care or early childhood program outside the home in the past year. This is consistent with the data on working mothers of preschoolers in Minnesota (Legislative Commission on the Economic Status of Women, 2004). Over half of the parents indicated that their child was in more than one type of care and/or education in the past year. In recent years, those interested in early childhood care and education have shown interest in comparing the implementation and outcomes of one type of early childhood care and education to another, but given the fact that many families use multiple settings, an analysis of this kind may not be appropriate nor a reliable reflection of children s experiences. Examining the combined impact of multiple settings and other variables on children s school readiness may instead be a more appropriate approach.

4. Female kindergartners in this study were consistently more proficient and showed fewer not yet readiness ratings in all domains than males. This finding is consistent with the research on gender and school achievement (Coley, 2002; Wertheimer & Croan, 2003; Zill & West, 2000).

About the Study Process

1. Using performance-based assessment such as the Work Sampling System is appropriate when working with elementary school principals and kindergarten teachers to assess children s readiness as they enter kindergarten. Many kindergarten teachers are familiar with the Work Sampling system of child assessment because they have used it to assess children in Title I in Minnesota. Teacher training for this assessment is essential, and most kindergarten teachers have participated in the needed training and have experience using Work Sampling. Therefore, teachers were able to use the same observation and documentation skills used for Title I assessment to rate the school readiness of children over a six-week period as they enter kindergarten. These teacher ratings can in turn be aggregated and analyzed to provide a meaningful developmental picture of the school readiness of a sample of Minnesota kindergarten children. Based on two years of experience implementing the study, the process can continue to be improved, particularly in the areas of school recruitment for the study and preparation of kindergarten teachers and other school personnel for implementation of the study.

Recommendations

The developmental assessment findings from the *Minnesota School Readiness Year Two Study: Developmental Assessment at Kindergarten Entrance* were consistent with the Year One pilot study developmental assessment findings. The results yield useful information for better understanding and responding to the school readiness needs of children prior to and at entrance into kindergarten. The additional Year Two data provided by the parent survey give information not previously available on children s early childhood care and education experience in the year before kindergarten and on family demographic information. While the early childhood care and education experience information gathering was exploratory and is reported only as state aggregated descriptive information, selected family information variables were related to the developmental assessment results to allow examination of the relationship of factors that may impact school readiness of children as they enter kindergarten. The information obtained on a representative sample of children entering kindergarten provides further evidence of what needs to be done to ensure that each Minnesota child enters school ready for success and is greeted by an environment that has the capacity to address the diverse needs of every child. The following are recommendations for action with regard to both the Minnesota School Readiness Year Two child assessment results and study process.

About Child Assessment Results

1. Continue to support parents in their role as children s first teachers. Parents are children s first and most important teachers and are critical to their children s success in school. Because of this, they should have access to the information and support they need regarding parenting. Providing information to parents about age and developmentally appropriate ways in which they can extend their children s learning through everyday activities and routines is one way this can be done. Providing group and individual parent education choices to parents to inform and enhance their parenting skills is another important way information and support regarding parenting can be provided to parents. This is particularly important for parents with lower family incomes and those with lower education levels.

2. Continue to increase schools ability to respond to the varying needs of children as they enter kindergarten. Both Year One and Year Two study results confirm that children come to kindergarten with variability in their skills, knowledge, behaviors, and accomplishments. Although much can be done during the child s early years to enhance these skills, knowledge, behaviors, and accomplishments, variability is normal for children entering kindergarten. Schools need to be prepared to address this variability, including both the children inconsistently demonstrating skills, knowledge, behaviors, and accomplishments and the children who enter school with low skills and are not yet able to perform many of the indicators studied.

3. Continue to work toward improving the quality of all early childhood care and education programs in Minnesota. Research tells us that children s development and learning is positively affected if early childhood care and education programs are of high quality. Quality early childhood care and education programming is of particular importance in helping to reduce the number of children who have inconsistently or not yet acquired the skills, knowledge, behaviors, and accomplishments expected as they enter kindergarten. The fact that sample parents reported that 77 percent of their kindergartners were cared for on a regular basis by someone other than a parent or attended a child care or early childhood program outside the home in the past year, consistent with data on mothers of preschoolers working outside the home in Minnesota (Legislative Commission on the Economic Status of Women, 2004) heightens the importance of this recommendation.

4. Continue focus on improving children s early language and literacy and mathematical skills at the same time increasing their personal and social skills and development in all areas. The developmental data from both years of the study show that these samples of Minnesota kindergartners are less proficient in the domains of language and literacy and mathematical thinking when they enter kindergarten than they are in the other three domains studied — physical development, the arts, and personal and social development. Early language and literacy and math experiences that are age and developmentally appropriate

should be included within the everyday activities of all children by parents, teachers, and caregivers. In doing so, care should be taken to avoid pushing academic activities for school-age children down to lower age levels inappropriately. In addition, personal and social development and all other areas of development should be emphasized because of their recognized importance to school readiness and school success. As part of this, teachers and providers can examine indicators within the developmental domains studied where children are more and less proficient and target teaching strategies accordingly.

5. Within the current context, target specific resources and more comprehensive, intensive education and services to those children (and their families) most likely to not yet show the skills, knowledge, behaviors, and accomplishments expected of children as they enter kindergarten. We know that all children benefit from high quality early childhood care and education programs. These programs are of particular importance in helping to reduce the number of children who do not yet have the skills, knowledge, behaviors, and accomplishments expected as they enter kindergarten. Those programs that are considered more comprehensive and offer intensive education provide opportunities to children who are considered at-risk or with special needs who are likely to struggle when they begin kindergarten and fall further behind as they continue in school. Based on study findings, paying particular attention to children in low income categories and whose parents have the least amount of education is especially important.

About the Study Process

1. Consider alternatives for continuing the Minnesota School Readiness Study: Developmental Assessment at Kindergarten Entrance. The process for conducting the Minnesota School Readiness Study focusing on the developmental assessment of kindergartners as they begin school has worked well for two years. Results are consistent from Year One to Year Two, and solid trends have emerged from two years of data. An option to consider for continuing this type of study is that of conducting it every two-three years to continue to assess and track the school readiness of Minnesota children as they enter kindergarten. Other options will be proposed and considered.

2. Find ways to work more directly with kindergarten teachers and support them throughout the study process, offering incentives and systematic training to all kindergarten teachers, if possible. Attempt to identify elementary schools to be included in the sample as soon as possible. Once sample principals agree to participate, begin communication with the kindergarten teachers involved and continue communication with them until the study is complete. Ask that each principal select a lead kindergarten teacher with whom study staff can communicate as soon as possible. If possible, meet once face-to-face with the kindergarten teachers or the lead kindergarten teacher in each school in order to discuss all study details with them, probably during the first two weeks in August. Work with principals and kindergarten teachers to identify options for offering incentives to the teachers for their extra effort. If teachers lack the training needed to effectively use the Work Sampling System, make needed training available. Work with principals and kindergarten teachers to identify ways in which they can make best use of the data they gather to enhance the curriculum and learning experiences for kindergartners in their schools and to work more closely with parents and early childhood care and education teachers, providers, and administrators to enhance the school readiness of children.

References

Chase, R., & Shelton, E. (2001). Child care use in Minnesota: *Report of the 1999 statewide household child care survey*. Roseville: Minnesota Department of Children, Families & Learning.

Child Trends. (October 2001). *Child trends research brief — school readiness: Helping communities get children ready for school and schools ready for children.* Washington, DC: Child Trends.

Coley, R. J. (2002). *An uneven start: Indicators of inequality in school readiness*. Princeton, NJ: Educational Testing Service.

Dichtelmiller, M. L., & Jablon, J. R. (1993). *The work sampling system professional development guide*. Ann Arbor, MI: Rebus.

Dichtelmiller, M. L., Jablon, J. R., Dorfman, A. B., Marsden, D. B., & Meisels, S. J. (2001). *Work sampling in the classroom: A teacher s manual*. Ann Arbor, MI: Rebus.

Dichtelmiller, M. L., Jablon, J. R., Marsden, D. B., & Meisels, S. J. (2001). *Preschool-4 developmental guidelines (4th Ed.)*. New York: Rebus.

Gershoff, E. (November 2003). *Living at the edge research brief 4: Low income and the development of America s kindergartners*. New York: National Center for Children in Poverty.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Brookes Publishing.

Hills, T. (1992). Reaching potentials through appropriate assessment. In S. Bredekamp & T. Rosegrant (Eds.). *Reaching potentials: Appropriate curriculum and assessment for young children, Vol. 1* (pp. 43 - 63). Washington, DC: National Association for the Education of Young Children.

Lee, V. E., & Burkam, D. T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economics Policy Institute.

Legislative Commission on the Economic Status of Women. (January 2004). *Fact sheet: Mothers in the labor force, Minnesota and U.S. 2000*. St. Paul, MN: Legislative Commission on the Economic Status of Women.

Meisels, S. J., Stetson, C., & Marsden, D. B. (2000). *Winning Ways to Learn Ages 6, 7 & 8: 600 Great Ideas for Children*. New York: Goddard Press.

Minnesota Department of Children, Families & Learning. (2000). *Minnesota early childhood indicators of progress: A resource guide*. Roseville: Minnesota Department of Children, Families & Learning.

Minnesota Department of Education. (2003). *Minnesota School Readiness Initiative: Developmental Assessment at Kindergarten Entrance Fall 2002 Pilot Study*. Roseville: Minnesota Department of Education.

National Education Goals Panel (February 1998). *Ready schools*. Washington, DC: National Education Goals Panel.

National Research Council & Institute of Medicine. (2000). *From neurons to neighbors: The science of early childhood development*. Washington, DC: National Academy Press.

Scott-Little, C., & Niemeyer, J. (2001). *Assessing kindergarten children: What school systems need to know*. Greensboro, NC: SERVE.

Wertheimer, R., & Croan, T. (December 2003). *Attending kindergarten and already behind: A statistical portrait of vulnerable young children*. Washington, DC: Child Trends.

Zill, N., & West, J. (2000). *Entering kindergarten: A portrait of American children when they begin school*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

APPENDIX A

Parent Survey
Minnesota School Readiness Initiative

Dear Kindergarten Parent,

Please help us learn about your kindergarten child and your family as part of a school readiness study. Neither you nor your child will be identified in the published study report.

If you choose not to answer the questions, it does not affect you or your child in any way. If you choose to answer the questions, summary information only will be used by the Minnesota Departments of Education and Human Services for this study. A copy may be kept in your child's school file along with other forms and information gathered by your school.

It will be helpful to talk with some parents in person about their child's early childhood care and education experiences, and study staff will make a few random phone calls to parents who are interested in talking with them. Would you be interested in receiving a brief follow-up phone call?

◯ **Yes** ◯ **No**

If yes, what is your first name? _____ and telephone number? ( ) _____

Thank you for your help!

USE A NO. 2 PENCIL ONLY

Early Childhood Care and Education Experience

1 Have you ever participated in a parent education class (either Early Childhood Family Education or another program)?

◯ **Yes** ◯ **No**

2 In the past year, was your kindergarten child cared for on a regular basis by someone other than a parent or did your child attend any child care or early childhood program outside of your home?

◯ **Yes** ◯ **No**

If no, go to question 4

3 **If yes to question 2,** please indicate where.

Type of care and/or education	**Was your child in any of these types of care and/or education in the last year? Please mark "yes" or "no" for each type.**	**Mark the ONE type of care and/or education that your child spent the MOST time in the last year other than in your home.**
Child care center	◯ **Yes** ◯ **No**	◯
Family child care home	◯ **Yes** ◯ **No**	◯
Head Start program	◯ **Yes** ◯ **No**	◯
Public or private preschool or nursery school	◯ **Yes** ◯ **No**	◯
Relative, friend, neighbor or nanny (in your home or their home)	◯ **Yes** ◯ **No**	◯

Family Information

4 Please indicate whether you are:

◯ **Mother** ◯ **Father** ◯ **Other**

5 Your highest level of school completed? Mark only one.

- ◯ 8th grade or less
- ◯ Some high school
- ◯ High school diploma/GED
- ◯ Trade school or some college beyond high school
- ◯ Associate degree
- ◯ Bachelor's degree
- ◯ Graduate or professional school degree

6 Your household's total yearly income before taxes? Mark only one.

- ◯ $0 - $35,000
- ◯ $35,001 to $55,000
- ◯ $55,001 to $75,000
- ◯ $75,001 to $105,000
- ◯ $105,000 or more

7 Race/ethnicity of your kindergarten child? Mark all that apply.

- ◯ Black/African/African American
- ◯ American Indian/Alaskan Native
- ◯ Asian/Native Hawaiian or other Pacific Islander
- ◯ Hispanic or Latino
- ◯ White/Caucasian
- ◯ Other

8 What language does your family speak most at home? Mark only one.

- ◯ English
- ◯ Spanish
- ◯ Hmong
- ◯ Somali
- ◯ Russian
- ◯ Other

9 Does your child receive special education through an Individual Education Plan (IEP) or Individual Interagency Intervention Plan (IIIP)?

◯ **Yes**
◯ **No**

Pearson Early Learning

Stop here. Thank you. Teacher completes other side.

APPENDIX A

FOR TEACHER COMPLETION ONLY

The Work Sampling System

The Minnesota Work Sampling System®
Kindergarten Entry
Developmental Checklist

INSTRUCTIONS

CORRECT: ●
INCORRECT: ✓ ✗ ◒ ⊙

USE A NO. 2 PENCIL ONLY

○ FEMALE
○ MALE

BLDG CODE		MARSS CODE												
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

LEGEND

(N) **Not Yet**—child cannot demonstrate indicator
(I) **In Process**—child demonstrates indicator intermittently
(P) **Proficient**—child can reliably demonstrate indicator

The Work Sampling System ***Preschool–4 Developmental Guidelines*** (4th edition) contains full descriptions of each performance indicator. (Number in parentheses indicates the page in the Guidelines where the indicator is described.)

I Personal and Social Development

A Self concept — Fall

1 Shows some self-direction. (p. 1) (N) (I) (P)

B Self control — Fall

1 Follows simple classroom rules and routines. (p. 1) (N) (I) (P)
2 Manages transitions. (p. 2) (N) (I) (P)

C Approaches to learning — Fall

1 Shows eagerness and curiosity as a learner. (p. 2) (N) (I) (P)
2 Attends to tasks and seeks help when encountering a problem. (p. 2) (N) (I) (P)
3 Approaches tasks with flexibility and inventiveness. (p. 3) (N) (I) (P)

D Interaction with others — Fall

1 Interacts easily with one or more children. (p. 3) (N) (I) (P)
2 Interacts easily with familiar adults. (p. 3) (N) (I) (P)
3 Shows empathy and caring for others. (p. 4) (N) (I) (P)

E Social problem-solving — Fall

1 Seeks adult help when needed to resolve conflicts. (p. 4) (N) (I) (P)

II Language and Literacy

A Listening — Fall

1 Gains meaning by listening. (p. 5) (N) (I) (P)
2 Follows two- or three-step directions. (p. 5) (N) (I) (P)
3 Demonstrates phonological awareness. (p. 5) (N) (I) (P)

B Speaking — Fall

1 Speaks clearly enough to be understood without contextual clues. (p. 6) (N) (I) (P)
2 Uses expanded vocabulary and language for a variety of purposes. (p. 6) (N) (I) (P)

C Reading — Fall

1 Shows appreciation for books and reading. (p. 6) (N) (I) (P)
2 Shows beginning understanding of concepts about print. (p. 7) (N) (I) (P)
3 Begins to develop knowledge about letters. (p. 7) (N) (I) (P)
4 Comprehends and responds to stories read aloud. (p. 7) (N) (I) (P)

D Writing — Fall

1 Represents ideas and stories through pictures, dictation, and play. (p. 8) (N) (I) (P)
2 Uses letter-like shapes, symbols, and letters to convey meaning. (p. 8) (N) (I) (P)

III Mathematical Thinking

A Mathematical processes — Fall

1 Begins to use simple strategies to solve mathematical problems. (p. 11) (N) (I) (P)

B Number and operations — Fall

1 Shows beginning understanding of number and quantity. (p. 11) (N) (I) (P)

C Geometry and spatial relations — Fall

1 Begins to recognize and describe the attributes of shapes. (p. 12) (N) (I) (P)
2 Shows understanding of and uses several positional words. (p. 12) (N) (I) (P)

IV The Arts

A Expression and representation — Fall

1 Participates in group music experiences. (p. 21) (N) (I) (P)
2 Participates in creative movement, dance, and drama. (p. 21) (N) (I) (P)
3 Uses a variety of art materials for tactile experience and exploration. (p. 21) (N) (I) (P)

B Understanding and appreciation — Fall

1 Responds to artistic creations or events. (p. 22) (N) (I) (P)

V Physical Development and Health

A Gross motor development — Fall

1 Coordinates movements to perform simple tasks. (p. 23) (N) (I) (P)

B Fine motor development — Fall

1 Uses eye-hand coordination to perform tasks. (p. 24) (N) (I) (P)

C Personal health and safety — Fall

1 Performs some self-care tasks independently. (p. 24) (N) (I) (P)

For teacher use only

K
Minnesota Edition

1. Personal and Social Development

A. Self-Concept

Preschool-4

Shows some self-direction.

Four-year-olds often seem independent because they want to do everything on their own. However, they still require encouragement to act independently in unfamiliar situations or when trying challenging tasks. Four-year-olds can make simple choices among activities, but occasionally need support in trying new classroom activities. Examples of initiative and independence include:

- Finding materials with which to work, such as scissors, tape, and markers, for acting on an idea or desire (for example, making a pretend camera for taking pictures);
- Finding and putting on one s own jacket, mittens, and hat before going outdoors;
- Deciding to build an airport with blocks, forming a plan, and then implementing it with others already working with blocks;
- Trying a new activity (for example, soap painting or a cooking project), and pursuing it for a meaningful period of time;
- Playing with different children rather than the same friend or friends every day;
- Choosing one activity out of several and becoming involved with it;
- Responding positively to suggestions to try something new.

Kindergarten

Shows initiative and self-direction

Independence in thinking and action enables children to take responsibility for themselves. Most five-year-olds can make choices among familiar activities, participate in new experiences, and are willing to take some risks. Children who choose familiar activities repeatedly and are hesitant to venture into new areas need help from adults in order to expand their independence. Some examples of independence are:

- Finding materials for projects (for example, glue to add their name card to a bar chart);
- Eagerly selecting new activities during choice time, such as trying the carpentry table or the computer for the first time;
- Assuming classroom chores without being asked (for example, sweeping sand from the floor, helping to clean up spilled juice);
- Choosing to work on a social studies project because the activity interests them, rather than because friends are doing it;
- Originating projects and working on them without extensive direction from the teacher.

2. Language and Literacy

D. Writing

Preschool-4

Uses letter-like shapes, symbols, and letters to convey meaning.

As children observe the teacher making lists and putting names on art work, they often want to write for themselves. Position of letters on the paper, actual formation of the letters, and correct order are not yet part of most four-year-olds repertoires. Many children become interested in writing their names and perhaps a few other significant words, while others will continue to ask for words to be written for them. Children s efforts to write at this age include:

- ¥ Making rows of squiggles and shapes on a paper and calling it writing;
- ¥ Labeling a drawing with several randomly placed letter-like shapes;
- ¥ Writing their own names from memory on their artwork;
- ¥ Spontaneously writing upper-case letters they know;
- ¥ Copying letters from signs and labels posted around the room, enjoying the power of doing real writing ;
- ¥ Making shopping lists consisting of pictures, scribbles, and letter-like shapes in the dramatic play area before going to the grocery store;
- ¥ Beginning to write several letters correctly.

Kindergarten

Uses letter-like shapes, symbols, letters, and words to convey meaning.

As children begin to understand that writing communicates a message, they become motivated to produce words, even if they do not possess conventional writing and spelling skills. They begin by using drawings to convey ideas, adding letters to words randomly. With experience, they begin to form words by using letters from their names, copying words, approaching others for help, sounding out words using letter-sound associations, and using invented or temporary spelling. By the end of kindergarten, many children can write most upper- and lower-case letters and know the conventional spelling for some words. Examples include:

- ¥ Making marks that resemble letters, starting at the top of the paper and moving from left to right and top to bottom;
- ¥ Writing their names on their artwork;
- ¥ Drawing a picture of a computer in their journal and using invented spelling to write I LK CMPTRS ;
- ¥ Using invented spelling to form words with initial and final consonants.

3. Mathematical Thinking

A. Mathematical Processes

Preschool-4

Begins to use simple strategies to solve mathematical problems.

Four-year-olds encounter real life mathematical problems throughout the day: How many cartons of milk do we need for snack? How can I fit these boxes together? How many days until we go to the zoo? With guidance, and in a classroom environment that supports asking questions, preschoolers can begin to solve simple mathematical problems in concrete ways, and offer basic explanations for their solutions. Examples include:

- Asking a friend if there are more people in your house or in mine? ;
- Trying to find a way to keep building a house with blocks, even though the long rectangular blocks have all been used;
- Asking a friend for a particular pattern block to complete a design;
- Figuring out how many small cups it takes to fill the pitcher at the water table;
- Wondering aloud how they can make their balls of play dough into a snake as long as the teacher s;
- Deciding who is older if one child is 4 and another is 4 1/2.

Kindergarten

Begins to use and explain strategies to solve mathematical problems.

Solving real-life problems helps children make connections among the math they are learning at school, other parts of their lives, and other types of learning. Problem-solving involves posing questions, trying different strategies, and explaining one s thinking by stating reasons a particular strategy worked. Young children solve problems and explain their reasoning by working with concrete objects, drawing pictures, or acting out solutions. They show this emerging skill by:

- Asking questions to clarify problems (for example, Will the new rabbit cage be big enough for the baby bunnies?);
- Saying I gave Sammy one of my cookies because I had three and he had one. Now we have the same, two and two! ;
- Estimating whether there are enough blocks to build a road from here to there, and then testing the guess by building the road;
- Solving problems by guessing and checking (for example, figuring out how many apples are needed for snack if each child is served half an apple).

4. The Arts

A. Expression and Representation

Preschool-4

Uses a variety of art materials for tactile experiences and exploration.

Four-year-olds are very active, and can sustain attention to art activities for only limited periods of time. They engage in the artistic process with great enthusiasm, but show little desire to produce a product. This enables them to explore various media with freedom. They demonstrate exploration by:

- Trying a variety of materials and ways of using the materials (for example, using a big brush to paint broad strokes, single lines going this way and that, or combining colors);
- Experimenting with play dough by rolling and patting it, cutting it with cookie cutters, sticking things into it, or sometimes making it into an object;
- Drawing or otherwise creating backdrops for puppet shows or signs for block structures;
- Using new implements such as Q-tips or straws, to paint a picture;
- Constructing a symmetrical design with pattern blocks;
- Using chalk on the blackboard or on paper;
- Using stamps or other objects to print with paint or ink.

Kindergarten

Uses a variety of art materials to explore and express ideas and emotions

Through extensive exploration with art materials, five-year-olds become confident using a variety of media and enhance their sense of mastery and creativity. Although they are primarily interested in the creative process, they are beginning to become more critical of the products they create. They can express their feelings and ideas through their art work, in addition to expressing them verbally. Examples of exploration and expression with art materials include:

- Trying a variety of expressive media (markers, brush and finger painting, printing, collage, play dough, clay);
- Drawing or painting the way they feel when they are happy;
- Making a book with their own pictures to illustrate a story they dictated;
- Using one medium for a period of time to develop greater control and expertise;
- Constructing a sculpture from wood pieces, fabric and foil;
- Creating an object or animal with clay.

5. Physical Development

B. Fine Motor Development

Preschool-4

Uses eye-hand coordination to perform tasks.

Four-year-olds demonstrate their eye-hand coordination skills as they start to construct with unit blocks, Tinker Toys, and Legos; put together puzzles; and experiment at the sand and water tables. Their artwork tends to become more complicated as they use newly mastered skills to create products. Examples of eye-hand coordination include:

¥ Zipping coats;

¥ Cutting on a line or around a large picture with scissors;

¥ Stringing beads or pasta with holes onto a length of yarn;

¥ Dressing dolls using snaps and buttons;

¥ Constructing or copying buildings and roads with the table blocks;

¥ Explaining to a classmate how to place individual puzzle pieces by matching shapes or colors or looking at picture clues;

¥ Using a hammer to try to pound nails into soft wood.

Kindergarten

Uses eye-hand coordination to perform tasks effectively.

Five-year-olds are continuing to improve their eye-hand coordination and accomplishing tasks with greater precision. They enjoy playing with manipulatives and blocks and sometimes work with a finished product in mind. Five-year-olds demonstrate eye-hand coordination by:

¥ Putting together 18- to 25- piece puzzles using pictures as well as shape cues;

¥ Dressing in a variety of costumes in the dramatic play area (buttoning shirts, zipping jackets);

¥ Building specific block structures from a model without knocking the structures down;

¥ Cutting fabric into shapes to use for collage;

¥ Using tape, stapler, and glue to create 3-D objects, such as a house or an airplane;

¥ Constructing planned projects out of Legos, Bristle Blocks, table blocks and Tinker Toys.