

The Effect of Participation in HighReach Learning Pre-Kindergarten Curriculum on Students' Kindergarten Assessment Scores

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By

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Abstract

Comparisons were made between the readiness for first grade assessments of 4,342 kindergarten students in 50 elementary schools using the HighReach Learning (HRL) *Frameworks* or *Butterflies* curriculum and 4,557 students attending 50 schools not using these curricula. Treatment and control schools were matched for student enrollment, population density, student ethnicity, and student participation in the free/reduced lunch program during the 2001-02 academic year. The dependent measure was the Georgia Kindergarten Awareness Profile-Revised (GKAP-R). Treatment and control schools were surveyed by telephone to assure that they met the parameters of the study and that the students who attended pre-kindergarten classes in the school were also scheduled to attend kindergarten/first grade in the same school.

The results of the study show that there is no difference between the outcome for students using the HRL curriculum and other curricula on the GKAP-R testing for all schools. However, when controlling for the largest subset of other curricula used, High Scope, HRL did produce statistically significant better results for students. HRL students also performed better in schools with high concentrations of minority students and very high proportions of free/reduced lunch participants.

These results support the effectiveness of HRL as an accomplished tool for early childhood instruction and may indicate that it is differentially effective for low income and/or minority children based on the integration of "priming mechanisms" into the HRL curriculum.

Introduction

Early Intervention, Curriculum and Quality

There have been many studies attempting to demonstrate a link between preschool participation and subsequent school performance. In the 1970's, the Perry Preschool Curriculum Demonstration Project reported that some of its graduates performed better on standardized achievement measures and were

less likely than those in a matched control group to be placed in special education classrooms. The Perry researchers divided their experimental group participants into three groups: those receiving a structured language oriented Bereiter-Engelmann curriculum, a Piagetian cognitively oriented curriculum, and a traditional nursery school curriculum. Evaluation of the school achievement made by the students in all three groups indicated that all the programs were effective (Stanley, 1972; Weikart, 1975). The researchers attributed the long term success of the students in retaining the gains made in their program to several factors, among them being a strong commitment to the program by the staff, use of consistent daily routines, daily teacher time spent in evaluation and planning, the use of paraprofessionals, home visits, and close contacts between teachers and an educational supervisor (ERS, 1975).

Similar studies from this period show varying results. The study of 2,100 children in eleven child-parent centers in Chicago showed long term benefits as measured by the Metropolitan Readiness Test from a curriculum oriented toward language development and basic skills (ESEA Title I, 1973). The Westinghouse-Ohio University study of Head Start programs compared participants with non-participants and found no significant differences at the second grade level (Westinghouse, 1969).

More recent studies measuring the effects of pre-kindergarten or preschool programs such as Head Start or Title I programs on later school achievement report varying results. Many report finding no differences in academic attainment or retention rates between participants in early childhood programs and non-participants (Christner & Baenen, 1988; Ohio Project Head Start, 1998). Others found differences but only for certain races, genders, or economically disadvantaged groups (Roth, Carter, Ariet, Resnick, & Crans, 2000; Marcon, 1993). In North Carolina, the Abecedarian study, using a very strong research design, has demonstrated the benefits of early (infant) intervention through age twenty-one in reading and mathematics achievement as well as other academic

measures. The 57 members of the experimental group received five years of “high-quality” childcare and daily individualized instruction (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2002).

The past decade has shown a steady increase in scientific evidence pointing to the importance of the quality of early learning experiences for young children’s development (Shonkoff & Phillips, 2000; Bowman, 2001). The evidence has been particularly strong with respect to early literacy and its impact on school readiness and children’s success in school (Snow et al., 1998; Whitehurst & Lonigan, 2001). While researchers are becoming clearer about behaviors and skills children need to develop before they reach school in order to be successful readers and math students, questions remain about how these skills and behaviors should best be taught. It has only been since the late 1980’s and early 1990’s that researchers have been investigating preschool classrooms and identifying classroom features that support the emergence of early literacy. Research tools, previously used to judge program quality pay little attention to specific activities and teaching behaviors known to promote literacy. Currently, it is possible to have recognized “high-quality”, accredited preschool programs that “only minimally or sporadically support language and literacy acquisition” (Dickinson, 2002). It is no wonder that many early childhood teachers question which approach to adopt in order to have programs that are of high quality and are effective. Grover Whitehurst, Assistant Secretary of Education for Research and Improvement has called for teaching materials and curricula that are scientifically-based in order to help teachers avoid “instructional confusion.”

During the 1980’s “high-quality” early childhood education was marked by a distinct avoidance of direct instruction or the teaching of any skill in isolation (e.g. letter names). The preponderance of research findings since that time have prompted national organizations such as NAEYC to dramatically change their positions on teachers’ roles in promoting early literacy. The NAEYC position statement of literacy released jointly with the International Reading Association (1998) builds upon research findings that show that successful readers enter

school with strong oral language, alphabet knowledge, phonological awareness, book and print knowledge, and early writing skills (1999; Adams, 1990; Torgeson & Davis, 1996; Goswami, 2001; Dickinson & Tabors, 2001).

Increased awareness of children's capacity for early literacy skill and the importance of such skill development for later school success has particular importance for children living in poverty. A landmark study of children's oral language estimated that three-year-olds in professional families use more complex language than adults in high poverty families do. The study estimates that by the time children are three, those from professional families have heard 30 million words, children in working-class families, 20 million words, and children from low-income families, 10 million words (Hart & Risley, 1995). The authors also suggest that the size of a child's receptive vocabulary by age three is related to the child's academic success through middle school, a finding confirmed by another recent study (Dickinson & Tabors, 2001).

Gaps due to economic opportunities need to be closed before children enter kindergarten, otherwise to close the gap, children in need of remedial services must achieve at a rate higher than the normative rate. The Head Start FACES report of longitudinal program performance (Zill et al., 2001) suggests that Head Start "works to narrow gaps between children who begin the program at differing levels of school readiness." Head Start programs employ a wide range of curriculum models and implement those they choose at different levels of integrity to the model. The FACES data do not speak to program models but indicate that overall, children in the programs while showing significant gains in vocabulary and writing skills over the Head Start year, showed no gains in letter recognition or book knowledge. They showed significant gains in social skills, but little or no change in problem behavior, with the exception of hyperactive behavior. Further, while children entering the program with lower skills showed significant gains, children with higher skills showed little or no gains." Another noteworthy finding of the FACES report is that there was no change in the proportion of parents who reported reading to their children every day, a finding

that holds significance in that children's word knowledge was related, in the study, to the frequency of parental reading to children.

Early intervention researchers Craig and Sharon Ramey show that the cognitive benefits that began with a high-quality preschool education prepared high-risk students to master the reading and math skills taught in schools and sustained achievement and social growth into adolescence (Ramey et al, 2000). Mastery in reading and math, "gateway" skills, lead to more successful outcomes throughout school and into early adulthood for children involved in their intervention. Through their longitudinal research efforts, the Rameys have identified elements programs must provide in order for children's sustained success, elements they call "priming mechanisms". These distinct elements address a teaching approach that blends child initiative, individualization, direct instruction with sufficient follow-up to ensure mastery, careful documentation of progress, and attention to the social and emotional dimensions of learning.

These "priming mechanisms" are:

- Encouragement of exploration
- Mentoring for basic skills
- Celebrations of developmental advances
- Guided rehearsal and extension of new skills
- Protection from inappropriate disapproval, teasing or punishment
- A rich and responsive language environment
- Guidance and limitation (Ramey & Ramey, 2002)

HighReach[®] Learning (HRL) Curriculum

The HRL Curriculum, designed for children ages twelve months to five years, emphasizes a blend of teacher-facilitated and child-initiated activities. The curriculum is delivered through monthly theme-based curriculum programs integrating language, literacy, mathematics, science, creative arts, physical, health, and social/emotional domains while attending to children's approaches to learning and individual learning styles. The curriculum provides training for teachers and materials to facilitate teachers' documentation of student learning.

HRL's assessment tool is aligned with the Head Start Outcome Measures (Head Start, 2000), which facilitates its integration into Head Start classrooms.

There are several overall key educational elements of HRL Learning curricula that impact its validity for educational research. One such key element is that HRL Learning is a well-established early childhood curricula in both private and public arenas. HRL Learning was established in 1986 and has continued to evolve with current research regarding early childhood development and learning. At the present time, over 250,000 preschool children in the United States are instructed using HRL materials on a daily basis. Another key element is that HRL has been shown to have a positive impact upon child outcomes and learning objectives (Sinclair Consulting Corp., 2001). This positive impact is reflected in school readiness test scores and teacher/provider surveys. A third key ingredient of HRL Learning curricula is its unique orientation toward providing suggested appropriate content and activity ideas that give attention to both academic and social/emotional dimensions of learning. This content includes a balanced blend of teacher-initiated activities and child-initiated activities in contrast to the more "open," less academic approaches. HRL Learning's content also includes suggested individualization and follow-up activities to ensure mastery and documentation of a child's progress.

Purpose of the Research Project

The purpose of this research was to demonstrate the efficacy of the HRL curriculum as part of a pre-kindergarten education and its relationship to subsequent educational achievement. The hypothesis associated with this research is that schools which implemented the HRL "Framework" or "Butterflies" curriculum with its pre-kindergarten population would show kindergarten literacy and mathematics achievement levels that were equal to or higher than those of matching schools that had utilized other curricula.

Previous research with HRL pre-kindergarten curriculum has shown that students in classrooms utilizing the curricula made greater than anticipated developmental

gains over an academic year and that the materials may be differentially more effective for low socio-economic status students (Sinclair Consulting Corp., 2001). Because of the manner in which the HRL curriculum is organized and presented in the classroom the researchers were interested in whether there was evidence for the differential effect of the curriculum in the current study and whether any differences obtained could be attributed to the “priming” mechanisms described by Ramey & Ramey (2002).

Methodology

The comparison of the outcomes of the HRL pre-kindergarten curriculum with other pre-k curricula rests upon the assumption that the treatment and control schools are similar. Obviously the best way to ensure this would be through a randomized experiment with all schools randomly assigned to one condition or the other. This level of scientific rigor is difficult to achieve in the real world of schools and such data are not available for this project. The next best solution is a quasi-experimental study using matched controls. This is the approach of the current study.

Identifying the Treatment Group

The HRL corporation database, which includes clients in all 50 states in the US, the Virgin Islands, Canada, Germany, Italy, Japan, and Mexico, was used to generate a list of clients. Due to a substantial HRL client population and the ready availability of assessment data for kindergarten students, it was decided that clients from the state of Georgia would form the basis of our treatment group. Of these 121 clients, 55 met the treatment criteria of having purchased and utilized the HRL pre-kindergarten curriculum during the 2000-2001 school year.

The dependent measure in this study was the results of the 2001-2002 Georgia Kindergarten Assessment Program-Revised (GKAP-R). The GKAP-R is a performance-based instrument developed by teachers and assessment specialists to determine a student’s readiness for first grade (Georgia

Department of Education, 2003). It consists of 32 activities that can be assessed in a variety of instructional settings (one-on-one, small group or large group) throughout the kindergarten year. Each activity corresponds to one of three domains: Literacy, Mathematics, and Social/Emotional development. The first and final assessments are administered during the first two weeks of school and beginning April 15. Only certified kindergarten or first grade teachers, who have been trained in its use, are permitted to administer the assessment. The median exact agreement rate for inter-observer reliability for the GKAP-R has been established at .83 making it a “reasonably reliable instrument” (Cramer, Benson, & Kim, 1999).

Once the assessment is complete, each student’s GKAP-R scores are totaled to indicate one of three levels of readiness. The “*Not Ready for First Grade*” category indicates students did not master the skills necessary to meet the criteria needed for first grade work. Students who score in the “*Needs Extra Instructional Assistance in First Grade*” are expected to need special teacher assistance. Those who score in the “*Ready for First Grade*” category have mastered the skills necessary for first grade work.

To verify that the treatment schools actually met the criteria for participation in this study, researchers designed and conducted a brief telephone survey (see Appendix A). The most important question on this survey was whether the school had actually used the HRL curriculum during the target year 2000-2001. Other areas of inquiry included whether the HRL curriculum was used exclusively or in concert with other programs, if their pre-k students proceed to kindergarten in the same school, and the level of student turnover. A school was excluded from the study if it was found to have implemented a non-HRL curriculum, sent its pre-k students to other schools for kindergarten, or had a high level of student turnover. Based on the information obtained in our telephone survey, five schools were excluded from the study leaving a total of 50 schools for the treatment group.

Identifying the Control Group

The matching control group was created from demographic and school data available on the web (U.S. Census Bureau, 2003; National Center for Education Statistics, 2003; Georgia Department of Education, 2003; Georgia Office of Education Accountability, 2003; GreatSchools.net, 2003). Each of the schools was matched on four variables critical to school success. These include school size, urbanity, socioeconomic status, and race/ethnicity. Suitable matches were those that fell within +/- 10 percentage points from the population mean on race/ethnicity (white or non-white) and free/reduced lunch, and within one standard deviation from the population mean on population density and school enrollment measures.

To verify that the control schools actually met the criteria for participation in this study, researchers designed and conducted a brief telephone survey virtually identical to the one used for the treatment group (see Appendix B). Again, it was most important to know which curriculum was used during the 2000-01 academic year. Also important was whether the curriculum was used exclusively or in concert with other programs, if their pre-k students proceed to kindergarten in the same school, and the student turnover rate. A school was excluded from the study if it was found to have implemented the HRL curriculum, sent its pre-k students to other schools for kindergarten, or had a high level of student turnover. A total of 50 matching schools were identified and selected as the control group.

School Readiness

In December 2002, the Georgia Department of Education published their *Public Education Report Card* for the academic year 2001-02. This is an annual publication that illustrates the performance of Georgia schools with regard to student achievement and completion. The report includes four major sections: school performance indicators, school demographics, national test results, and student performance results from Georgia tests. The data in this report, specifically the results of the Georgia Kindergarten Assessment Program

Revised (GKAP-R), were used to assess the effectiveness of the HRL curriculum.

The readiness data for each school participating in this study were obtained from the Georgia DOE website. For example, on a school level it was possible to identify the students whose test scores fell into one of the three previously mentioned categories: “*Ready for First Grade*,” “*Needs Extra Instructional Assistance in First Grade*,” and “*Not Ready for First Grade*.” Once downloaded, these numbers formed the basis of our analyses.

Results

Descriptive Statistics

The data for the 50 treatment schools utilizing the HRL curriculum and the 50 matching control schools is presented in Appendix C. A total of 8,899 kindergarten students attending these schools are represented by GKAP-R testing results. There were 4,342 students assessed in the treatment schools and 4,557 in the matching schools. Forty of the matching schools reported using the *High Scope* curriculum, five *Creative Curriculum*, four locally developed curricula, and one a combination of “best practices” and *High Scope*. *High Scope* and *Creative Curriculum* are both commercially produced curricula serving children ages 0-7 and 3-5 respectively. Both are available nationwide and provide detailed information about their products on-line through their websites (www.highscope.org; www.teachingstrategies.com).

The descriptive statistics in Table 1 show the distribution of the demographic variables used in the school matching procedure. These data show a large range in the size of the schools included in the study, their setting in terms of urbanity, their racial/ethnic composition, and relative affluence.

Table 1. Descriptive statistics for all schools (N=100)

	% Asian	% Black	% Hispanic	% Nat. Am.	% Multiracial	% White
Mean	4.6000E-03	.40560	4.6800E-02	1.3000E-03	1.4600E-02	.52550
Median	.00000	.39000	2.0000E-02	.00000	1.0000E-02	.55000
Mode	.000	.330	.010	.000	.010	.440
Std. Deviation	7.4427E-03	.22935	7.3125E-02	3.9325E-03	1.2667E-02	.22822
Minimum	.000	.000	.000	.000	.000	.000
Maximum	.040	1.000	.390	.020	.060	.960

	% Free/Reduced Lunch	Pop. Density	School enrollment
Mean	.59028	928.025	552
Median	.57200	845.600	550
Mode	.422	1615.0	411
Std. Deviation	.18501	427.181	122.97
Minimum	.121	182.4	186
Maximum	.946	2183.0	958

Table 2 shows the mean scores for the four matching variables for the treatment and control schools. The ANOVA testing in Table 3 showed no significant differences on the matching variables between treatment and control schools.

Table 2. Matching variable means and standard deviations by treatment and control groups

Tx - Ctrl		% White	% FR	School enrollment	POP_DENS
Ctrl	Mean	.5130	.5928	563.74	934.420
	N	50	50	50	50
	Std. Deviation	.2303	.1812	113.07	352.299
Tx	Mean	.5380	.5878	539.34	921.630
	N	50	50	50	50
	Std. Deviation	.2278	.1905	132.14	494.462
Total	Mean	.5255	.5903	551.54	928.025
	N	100	100	100	100
	Std. Deviation	.2282	.1850	122.97	427.181

Table 3. ANOVA of matching variables

	Sum of Squares	df	Mean Square	F	Sig.
% White * Between (Combined) Tx - Ctrl Groups	.016	1	.016	.298	.586
Within Groups	5.141	98	.052		
Total	5.156	99			
% FR * Tx - Between (Combined) Ctrl Groups	.001	1	.001	.018	.893
Within Groups	3.388	98	.035		
Total	3.389	99			
School enrollment * Between (Combined) Tx - Ctrl Groups	14884.000	1	14884.000	.984	.324
Within Groups	1482062.840	98	15123.090		
Total	1496946.840	99			
POP_DENS * Between (Combined) Tx - Ctrl Groups	4089.602	1	4089.602	.022	.882
Within Groups	18061762.665	98	184303.701		
Total	18065852.268	99			

Table 4 shows the summary distribution of the GKAP-R results. Overall, 91.7% of all students were identified as “ready” for first grade, 6.0% as “ready with help,” and 2.3% as “not ready.” These data compare to the overall state results as follows: 1.0% “not ready,” 2.0% “ready with help,” and 97% ready. The students in HRL schools showed lower percentages of “not ready” and “ready with help” results than students in schools using other curricula and a slightly higher percentage of students (1.3%) were identified as “ready,” i.e., the HRL treatment schools demonstrated achievement levels higher than both overall state and matched schools, but only slightly so. Whether these differences are statistically significant is addressed below.

Table 4. Number and percent of treatment and matching students classified by GKAP-R readiness status

		Readiness Status			
		Not Ready	Ready With Help	Ready	Total
Treatment	Number	89	242	4011	4342
	Percent	2.0%	5.6%	92.4%	100.0%
Match	Number	113	294	4150	4557
	Percent	2.5%	6.5%	91.1%	100.0%
Total	Number	202	536	8161	8899
	Percent	2.3%	6.0%	91.7%	100.0%

Significance Tests

The analysis of the treatment and comparison group data was carried out using two non-parametric tests of significance, chi-square, and the Wilcoxon Signed Ranks Test. The comparisons showed that at the overall level there were no statistically significant differences between the level of readiness of students in the treatment schools and students in the matched comparison schools. The Wilcoxon test yielded levels of significance from .520 to .151 (Table 5) while the chi-square results were .079 (Table 6).

Table 5. Test Statistics Wilcoxon Signed Ranks

	Trt. not ready Ctl. not ready	Trt. ready with help Ctl. ready with help	Trt. Ready Ctl. ready
Z	-.643	-1.044	-1.437
Asymp. Sig. (2-tailed)	.520	.296	.151

Table 6. Chi-Square Tests

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.072	2	.079
Likelihood Ratio	5.084	2	.079
Linear-by-Linear Association	4.802	1	.028

Further comparisons using the matching variables as controls yielded different results. When comparing treatment schools to only those schools who reported using the High Scope curriculum (n = 40) it was found that there was a significant difference in student outcomes (Table 7) with treatment students having lower levels of “not ready” and “ready with help” but a higher level of “ready” students,

i.e., the HRL treatment schools outperformed the subgroup of control schools at a statistically significant level.

Table 7. Cross tabulation HRL and High Scope schools

		Readiness Status			Total
		Not ready	Ready with help	Ready	
Treatment	Count	72	202	3180	3454
	% within condition	2.1%	5.8%	92.1%	100.0%
Match	Count	98	254	3318	3670
	% within condition	2.7%	6.9%	90.4%	100.0%
Total	Count	170	456	6498	7124
	% within condition	2.4%	6.4%	91.2%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.294	2	.043
Likelihood Ratio	6.316	2	.043
Linear-by-Linear Association	6.097	1	.014

An even stronger effect was found for the students in the 25 treatment schools versus students in the 25 matching schools where the percentage of minority student enrollment was higher than the median. In this case the level of significance was .007 with treatment students outperforming those in matching schools, i.e., again, and at a higher level of statistical significance, the students in the treatment schools with higher than the median level percentage of minority students did better than the students from similar control schools.

Table 8. Cross tabulation high percentage minority enrollment schools only

		Readiness status			Total
		Not ready	Ready with help	Ready	
Treatment	Count	42	141	2018	2201
	% within condition	1.9%	6.4%	91.7%	100.0%
Control	Count	66	181	2002	2249
	% within condition	2.9%	8.0%	89.0%	100.0%
Total	Count	108	322	4020	4450
	% within condition	2.4%	7.2%	90.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.849	2	.007
Likelihood Ratio	9.906	2	.007
Linear-by-Linear Association	9.806	1	.002

Chi-square comparisons made looking only at high-density population schools (above the median), high poverty (above the median for free-lunch), and small schools (below the median in enrollment) found no significant differences between matching and treatment schools. Analysis of the results for students in schools with families with very low income enrollment (at or above the 75th percentile) did reveal a significant chi-square value (see Table 9), i.e., again the HRL students did better than the students from similar control schools. There were eleven schools in both the treatment and matching schools groups.

Table 9. Cross tabulation high percentage low income (> 75th percentile) schools only

		Readiness status			Total
		Not ready	Ready with help	Ready	
Treatment	Count	16	60	746	822
	% within condition	1.9%	7.3%	90.8%	100.0%
Control	Count	29	89	790	908
	% within condition	3.2%	9.8%	87.0%	100.0%
Total	Count	45	149	1536	1730
	% within condition	2.6%	8.6%	88.8%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.401	2	.041
Likelihood Ratio	6.474	2	.039
Linear-by-Linear Association	6.294	1	.012

Discussion

Based on the chi-square analysis of treatment and control school data there is no difference, in terms of kindergarten outcome as measured by GKAP-R scores, between the use of the HRL curriculum and other curricula being implemented in Georgia public pre-kindergarten classrooms.

The HRL curriculum does appear to be more effective when compared specifically to the High Scope curriculum and in schools with high concentrations of minority students or very high concentrations of low-income students. The results for low income students should be interpreted with care since a limited number of schools were involved in the analysis; however, these results are

similar to the findings of Sinclair, Ross & Shortt (2001) in that they reported greater gains on their dependent measure for students in classrooms utilizing the HRL curriculum than in classes for middle and upper income students.

Although the current study did not explore the overall quality of the classrooms where the HRL or control curricula were implemented or look at other factors that might effect outcomes related to classroom/teacher quality differences (e.g., availability of materials, classroom arrangement, teacher experience, training in the curriculum model, etc.) it is possible based on the comparison of the Ramey's priming mechanisms model and the components of the HRL curriculum to speculate on how the curriculum may reinforce learning for low-income/at-risk students.

Encouragement of Exploration: The HRL curricula present new concepts via integrated thematic units. Thematic units allow the teacher to incorporate a variety of concepts into a topic area that is interesting, appropriate, and gives meaning and context to these concepts (Morrow, 1997). Once new concepts are introduced with direct instruction from the teacher, the children are encouraged to explore a variety of extension activities during child initiated center time. The HRL curricula provide teachers with suggested activities and materials to aid in the children's exploration of new concepts. In addition to the suggested activities and materials, teachers are provided with conversation starter questions to further aid them in supporting children's exploration.

Mentoring for Basic Skills: Teachers utilizing the HRL curricula are encouraged to mentor basic skills via ongoing authentic assessment. Authentic assessment captures children's development and learning in their daily activities and takes place as part of ongoing life and learning in the classroom, playground, hallway, lunchroom, and other typical school and center settings (McAfee & Leong, 1994). Teachers are provided with easy to use tools to assist them in recording ongoing observations. Once observations are recorded, teachers use the information learned to determine child progress in the concepts being taught.

Celebrations of Developmental Advances: The HRL preschool curricula encourage family participation in the celebration of children's developmental advances. Many opportunities and materials are provided daily to promote family involvement. These materials include family letters to share classroom activities and communication tools to share children's successes. HRL also promotes family communication via the use of child portfolios. In addition, parent reports are available from the on-going child

assessment tool. On-site training also focuses on celebrating the developmental success of children.

Guided Rehearsal and Extension of New Skills: Children need both guided and independent practice with new concepts and skills (Barnett & Escobar, 1987). The HRL curricula provide children with a balanced approach to learning. A balanced approach combines teacher-guided activities with child-initiated opportunities. Furthermore young children learn through meaningful activities in which different subject areas are integrated. Open-ended discussions and activities bring together science, social studies, dramatic play, and artistic creation. Activities that are meaningful and relevant to the child's life experiences provide opportunities to teach across the curriculum and assist children in seeing the interrelationships of things they are learning (Edwards & Hiler, 1993). Experiences are provided daily in the HRL curricula to provide children with this necessary balance of meaningful activities.

Protection from Inappropriate Disapproval, Teasing, or Punishment: The HRL curricula offer daily experiences which promote character education. These experiences include, but are not limited to, honesty, respect, persistence, sharing, and respecting our environment. In addition, opportunities are presented which incorporate cultural respect. These activities such as the reading of appropriate folktales or the highlighting of appropriate cultural events and customs can be a way to foster group identity, interests, and acceptance (Dixon & Fraser, 1986). Teachers are encouraged to model appropriate social behavior in the classroom. By using the classroom as a social setting, children learn to extend social skills into the school, home, and community.

A Rich and Responsive Language Environment: According to the National Research Council, language development during the preschool years that includes development of vocabulary and language forms used for oral and written communication is an important domain of preparation for formal reading instruction (National Research Council, 1998). Literacy development is enhanced by strong oral abilities as oral language plays a vital role in a child's ability to anticipate and verify written words in context (Snow, 1983). The HRL preschool curricula provide multiple experiences daily to encourage and promote a rich language environment. In addition the curriculum includes a wide range of ethnic representations and print exposure of materials such as vocabulary cards, rebus rhymes, big books, little books, rhyme displays, story props, wall displays, and songs.

Guidance and Limitation: Each HRL curriculum program provides teachers with a training manual. This support document gives guidance on classroom management in regard to the importance of a daily schedule and setting classroom rules in a realistic and reasonable manner. In addition, suggestions for behavior management techniques and child-

initiated center management are provided. On-site training also focuses on positive guidance.

These findings encourage the development of further randomized longitudinal research to examine the developmental and academic outcomes for children receiving the HRL curriculum.

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Appendix A: HRL[®] Learning Treatment School Telephone Survey

School Name:

County:

1. What literacy programs were you using in your pre-k classrooms during the 2000-2001 school year?
2. Which one did you use most often? (*only if more than one program was used*)
3. Was that literacy program used in all your pre-k classrooms?
4. Did the majority of those pre-k students enroll in your kindergarten class?
5. How would you describe the turnover rate at your school compared to other elementary schools in your area (low, average or high)?
6. What is your student turnover rate (*estimate*)?

Comments:

Appendix B: HRL[®] Learning Control School Telephone Survey

School Name:

County:

1. What literacy programs were you using in your pre-k classrooms during the 2000-2001 school year?
2. Which one did you use most often? (*only if more than one program was used*)
3. Was that literacy program used in all your pre-k classrooms?
4. Did the majority of those pre-k students enroll in your kindergarten class?
5. How would you describe the turnover rate at your school compared to other elementary schools in your area (low, average or high)?
6. What is your student turnover rate (*estimate*)?

Comments:

Appendix C: Treatment and Control School Data

School type and size		Race/ Ethnicity (schoolwide %)						Socio-economic	Urbanity	Readiness (%)			Readiness (n)				
Matching schools	School enrollment	Asian	Black	Hisp	NatAm	Multi	White	% FR	Pop dens	Not ready	Needs assistance	Ready	Not ready	Needs assistance	Ready	Total tested	
1	Treatment	531	0.00	0.26	0.05	0.00	0.01	0.69	0.546	565	1	3	95	1	4	138	145
	Control	531	0.00	0.26	0.02	0.00	0.00	0.72	0.578	506	2	6	92	1	4	57	62
2	Treatment	587	0.00	0.38	0.01	0.00	0.00	0.60	0.540	662	1	2	97	1	2	91	94
	Control	593	0.02	0.35	0.05	0.00	0.02	0.57	0.568	826	2	3	95	2	3	100	105
3	Treatment	491	0.01	0.46	0.10	0.00	0.00	0.44	0.593	662	2	7	92	1	4	56	61
	Control	590	0.01	0.14	0.39	0.01	0.01	0.44	0.615	907	7	3	90	8	3	101	112
4	Treatment	377	0.00	0.83	0.14	0.00	0.00	0.03	0.907	662	3	3	94	2	2	61	65
	Control	424	0.00	1.00	0.00	0.00	0.00	0.00	0.932	617	0	3	97	0	2	63	65
5	Treatment	517	0.00	0.56	0.04	0.00	0.00	0.39	0.723	662	0	10	90	0	6	53	59
	Control	658	0.00	0.74	0.02	0.00	0.00	0.23	0.707	773	3	5	92	3	5	94	102
6	Treatment	570	0.00	0.51	0.03	0.00	0.00	0.46	0.723	662	0	5	95	0	5	88	93
	Control	562	0.00	0.68	0.23	0.00	0.01	0.08	0.719	852	1	25	74	1	21	63	85
7	Treatment	620	0.00	0.13	0.00	0.00	0.00	0.86	0.319	652	3	4	93	3	4	96	103
	Control	577	0.00	0.19	0.01	0.00	0.02	0.78	0.367	839	0	9	91	0	8	79	87
8	Treatment	589	0.01	0.23	0.01	0.00	0.02	0.73	0.452	770	1	1	97	1	1	73	75
	Control	533	0.00	0.32	0.00	0.01	0.01	0.65	0.482	740	2	2	95	2	2	83	87
9	Treatment	538	0.00	0.02	0.01	0.00	0.01	0.96	0.221	770	1	1	98	1	1	78	80
	Control	532	0.04	0.11	0.02	0.00	0.00	0.83	0.265	942	0	2	98	0	2	88	90
10	Treatment	700	0.01	0.07	0.01	0.00	0.01	0.90	0.121	770	1	2	97	1	2	105	108
	Control	544	0.01	0.16	0.01	0.00	0.02	0.80	0.153	939	0	1	99	0	1	79	80
11	Treatment	486	0.00	0.08	0.02	0.00	0.01	0.90	0.504	770	0	6	94	0	3	51	54
	Control	571	0.01	0.06	0.00	0.00	0.02	0.91	0.496	828	1	4	95	1	3	80	84
12	Treatment	604	0.00	0.36	0.00	0.00	0.01	0.62	0.508	854	1	6	93	1	6	88	95
	Control	648	0.02	0.25	0.04	0.00	0.03	0.65	0.495	942	1	0	99	1	0	107	108
13	Treatment	571	0.01	0.40	0.05	0.00	0.01	0.54	0.644	992	2	2	96	2	2	86	90
	Control	628	0.01	0.35	0.09	0.00	0.02	0.54	0.619	826	2	4	93	2	4	86	92
14	Treatment	344	0.00	0.62	0.08	0.00	0.03	0.27	0.869	992	2	6	93	1	3	50	54
	Control	350	0.02	0.70	0.02	0.00	0.03	0.23	0.846	861	6	0	94	2	0	33	35
15	Treatment	738	0.01	0.55	0.03	0.00	0.01	0.40	0.617	992	2	8	91	2	9	106	117
	Control	481	0.02	0.51	0.07	0.00	0.03	0.36	0.576	907	0	6	94	0	5	81	86
16	Treatment	468	0.00	0.27	0.04	0.01	0.00	0.67	0.487	554	2	14	83	1	6	35	42
	Control	484	0.00	0.34	0.02	0.00	0.01	0.63	0.481	861	0	5	95	0	4	84	88

Appendix C (cont'd)

17	Treatment	804	0.00	0.15	0.01	0.00	0.02	0.81	0.496	278	4	5	91	5	7	120	132
	Control	753	0.01	0.00	0.12	0.00	0.02	0.85	0.526	750	3	4	94	3	4	102	108
18	Treatment	490	0.00	0.43	0.04	0.00	0.01	0.52	0.692	513	5	3	92	6	4	109	118
	Control	611	0.00	0.15	0.23	0.00	0.06	0.55	0.710	1013	1	7	92	1	7	90	98
19	Treatment	612	0.00	0.61	0.01	0.00	0.01	0.36	0.694	1727	3	9	88	4	12	116	132
	Control	640	0.01	0.50	0.05	0.00	0.05	0.39	0.688	939	1	12	87	1	13	93	107
20	Treatment	643	0.00	0.35	0.07	0.00	0.00	0.58	0.715	194	12	8	80	9	6	61	76
	Control	616	0.01	0.31	0.10	0.00	0.02	0.57	0.692	581	1	7	93	2	11	140	150
21	Treatment	724	0.00	0.33	0.02	0.02	0.03	0.60	0.380	839	0	0	100	0	0	106	106
	Control	733	0.00	0.40	0.02	0.00	0.02	0.57	0.422	906	3	7	90	4	9	110	122
22	Treatment	810	0.01	0.18	0.02	0.00	0.01	0.78	0.372	338	2	5	93	3	8	141	152
	Control	675	0.00	0.23	0.01	0.00	0.01	0.75	0.345	375	1	6	93	1	8	118	127
23	Treatment	958	0.00	0.49	0.06	0.00	0.01	0.44	0.801	703	2	7	91	3	9	114	125
	Control	956	0.00	0.55	0.01	0.00	0.00	0.43	0.775	602	10	10	79	12	12	92	117
24	Treatment	475	0.00	0.95	0.00	0.00	0.01	0.04	0.941	1615	2	9	89	1	5	49	55
	Control	502	0.00	0.95	0.00	0.00	0.01	0.04	0.916	1057	5	21	74	4	16	58	78
25	Treatment	581	0.01	0.10	0.02	0.00	0.01	0.86	0.509	1615	0	4	96	0	3	79	82
	Control	558	0.00	0.10	0.00	0.00	0.00	0.89	0.455	669	11	8	82	4	3	31	38
26	Treatment	473	0.01	0.16	0.01	0.00	0.00	0.82	0.165	1615	3	0	97	2	0	61	63
	Control	540	0.01	0.20	0.00	0.00	0.01	0.78	0.163	1784	3	0	97	2	0	65	67
27	Treatment	525	0.00	0.27	0.02	0.00	0.01	0.69	0.507	1615	2	10	88	1	6	53	60
	Control	601	0.00	0.29	0.04	0.00	0.01	0.65	0.529	1460	2	2	95	2	2	82	86
28	Treatment	440	0.00	0.18	0.01	0.00	0.02	0.78	0.518	1615	0	11	89	0	7	57	64
	Control	619	0.00	0.20	0.01	0.00	0.02	0.76	0.514	720	6	4	90	5	3	76	84
29	Treatment	557	0.00	0.39	0.01	0.00	0.01	0.59	0.544	1615	3	13	84	2	9	59	70
	Control	423	0.01	0.43	0.00	0.00	0.00	0.56	0.518	1183	2	12	86	1	6	43	50
30	Treatment	483	0.00	0.99	0.00	0.00	0.00	0.01	0.890	1615	1	7	92	1	5	65	71
	Control	411	0.00	0.94	0.02	0.00	0.01	0.02	0.886	1760	5	0	95	2	0	42	44
31	Treatment	706	0.02	0.38	0.03	0.00	0.01	0.57	0.537	1615	6	5	89	6	5	90	101
	Control	506	0.00	0.12	0.28	0.00	0.00	0.59	0.557	1384	8	10	82	6	8	63	77
32	Treatment	186	0.00	0.89	0.00	0.00	0.04	0.08	0.946	182	0	0	100	0	0	13	13
	Control	336	0.00	0.55	0.32	0.00	0.03	0.10	0.923	852	2	18	80	1	9	39	49

Appendix C (cont'd)

33	Treatment	426	0.01	0.45	0.07	0.00	0.00	0.47	0.556	1686	1	4	95	1	4	87	92
	Control	433	0.00	0.48	0.02	0.00	0.01	0.49	0.633	1727	2	5	93	2	6	109	117
34	Treatment	596	0.01	0.39	0.12	0.00	0.03	0.44	0.775	1686	2	5	93	3	7	136	146
	Control	616	0.02	0.58	0.02	0.00	0.01	0.38	0.768	2183	0	4	96	0	4	97	101
35	Treatment	621	0.01	0.47	0.08	0.00	0.02	0.42	0.646	1686	4	10	86	6	15	132	153
	Control	639	0.00	0.45	0.05	0.00	0.04	0.45	0.646	939	4	8	88	4	8	88	100
36	Treatment	630	0.01	0.41	0.02	0.00	0.01	0.55	0.490	1686	1	4	96	1	6	132	138
	Control	448	0.02	0.33	0.09	0.00	0.04	0.53	0.460	938	3	3	95	2	2	74	78
37	Treatment	468	0.00	0.07	0.35	0.00	0.00	0.58	0.611	755	0	4	96	0	3	67	70
	Control	514	0.01	0.40	0.02	0.00	0.02	0.54	0.644	617	0	4	96	0	3	64	67
38	Treatment	404	0.00	0.54	0.00	0.00	0.02	0.44	0.666	418	1	3	96	1	2	71	74
	Control	517	0.00	0.51	0.03	0.00	0.03	0.43	0.687	548	0	4	96	0	5	114	119
39	Treatment	406	0.00	0.51	0.01	0.00	0.01	0.47	0.493	418	1	6	93	1	4	62	67
	Control	414	0.01	0.42	0.08	0.00	0.00	0.48	0.529	906	6	9	85	4	6	58	68
40	Treatment	447	0.00	0.48	0.00	0.01	0.03	0.47	0.651	418	0	7	93	0	7	87	94
	Control	713	0.00	0.42	0.08	0.00	0.00	0.49	0.703	553	6	16	79	7	20	96	122
41	Treatment	529	0.00	0.33	0.01	0.01	0.03	0.62	0.446	418	4	6	90	4	6	88	98
	Control	621	0.00	0.26	0.10	0.00	0.00	0.64	0.486	1013	0	6	94	0	6	87	93
42	Treatment	411	0.00	0.37	0.01	0.00	0.02	0.60	0.676	418	2	6	92	1	3	46	50
	Control	574	0.00	0.39	0.03	0.00	0.03	0.56	0.667	806	3	7	90	5	11	140	155
43	Treatment	561	0.00	0.37	0.02	0.01	0.03	0.57	0.396	898	0	1	99	0	1	70	71
	Control	585	0.02	0.35	0.04	0.01	0.03	0.55	0.424	938	2	1	96	2	1	82	85
44	Treatment	516	0.00	0.33	0.01	0.01	0.02	0.63	0.422	898	1	3	96	1	2	73	76
	Control	637	0.00	0.32	0.04	0.01	0.03	0.59	0.422	839	2	6	92	2	6	99	108
45	Treatment	473	0.00	0.45	0.01	0.02	0.03	0.48	0.526	898	1	3	96	1	2	72	75
	Control	465	0.02	0.45	0.02	0.00	0.01	0.51	0.503	1013	1	4	94	1	3	68	72
46	Treatment	427	0.00	0.27	0.01	0.00	0.02	0.70	0.454	898	3	9	88	2	7	68	77
	Control	652	0.00	0.30	0.01	0.00	0.03	0.66	0.492	984	2	7	91	2	7	91	100
47	Treatment	429	0.00	0.50	0.00	0.00	0.03	0.46	0.788	418	0	4	96	0	3	71	74
	Control	703	0.00	0.53	0.00	0.00	0.00	0.47	0.760	648	0	6	94	0	7	104	111
48	Treatment	447	0.00	0.61	0.00	0.00	0.01	0.38	0.662	764	0	8	92	0	6	65	71
	Control	463	0.00	0.50	0.09	0.00	0.02	0.39	0.646	656	1	9	90	1	6	60	67

Appendix C (cont'd)

49	Treatment	556	0.00	0.43	0.01	0.00	0.01	0.55	0.728	418	2	12	86	2	12	87	101
	Control	609	0.00	0.41	0.05	0.00	0.01	0.52	0.757	826	1	2	97	1	2	88	91
50	Treatment	422	0.01	0.88	0.02	0	0.01	0.08	0.922	1615	7	14	80	4	8	47	59
	Control	398	0	0.94	0.01	0	0	0.05	0.894	1386	5	12	83	7	16	110	133