

**School Readiness Enrichment in Rural Wisconsin Title 1 Schools
using K-3 SMART Neuro-Educational Programming
(Stimulating Maturity through Accelerated Readiness Training):
An Interim Report
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Abstract

First-grade and kindergarten readiness results, as well as word recognition and auditory discrimination measures are reported for grades K-3 in rural Wisconsin Title 1 schools using the SMART neuro-educational program as compensatory enrichment of regular low SES/economically disadvantaged students (excluding repeaters and special education). May Metropolitan Readiness Test-6th Edition scores from daily all-day kindergartens showed significantly higher Pre-Reading Composite proportions above the national mean for the 165 SMART students compared to 43 controls ($p=.02$). A high proportion of 95% of SMART kindergarteners scored above Q1. SMART-enriched readiness for kindergarten among pre-kindergarten pupils identified early as at-risk and immature produced proportions of 63% above Q1 with 97 students in 7 classes. A model SMART pre-k compensatory program produced proportions of 100% of 53 students above both Q1 and the norm mean on the MRT6(Level 1) in 4 classes taught by a master teacher. Following explicit instruction, SMART kindergarteners tested on recognition of high-frequency words within 5 seconds scored a median of 19 words and 68% of students read at least 10 words; the model SMART program had a median of 30 words and 97% of students read 10+ words. Wepman Auditory Discrimination Test standard scores tested SMART pre-phonemic awareness of consonant and vowel sound differences in which 80% of students scored above Q1. CBA of print quality documented 77% of SMART kindergarteners with expected SMART early first grade manuscript quality.

For grades 1-3 (120-131 students per grade) the Slosson Oral Reading Test-R3 tested isolated word recognition within 5 seconds from lists. May SORT-R3 testing revealed high proportions of 83-95% of students above Q1, with median standard scores of 103-109. Wepman Auditory Discrimination Test scores for SMART phonemic awareness readiness improved at every grade with proportions of 85-97% of students scoring above Q1. May median standard scores in auditory discrimination ranged from 106-112 after increasing from fall scores.

SMART brain stimulation programming produced high proportions of students above Q1 and above the norm means. These students had experienced more than one year of activation resulting in increased standard scores and proportions of pupils above Q1. Pre-k and kindergarten enrichment through age-appropriate brain stimulation produced readiness and early literacy improvement for large proportions of students to normal and superior levels in this Title 1 school population

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A Project for School Readiness

The purpose of this study was to measure student and teacher performance levels and proportions of proficiency of first-grade readiness and early literacy following SMART (Stimulating Maturity through Accelerated Readiness Training) compensatory neuro-educational enrichment in Title 1 schools at grades K-3. Students in grades 1-3 experienced SMART in the previous year. Results of pre-k SMART program provide documentation of SMART stimulation prior to kindergarten as one approach to providing more than one year of compensatory stimulation.

The SMART Neuro-Educational Program

Assuring that all students are “ready” for school has been the nation’s number one educational goal since 1990. Students in Title 1 schools are particularly vulnerable to lack of readiness for first-grade academics because of cultural, environmental and/or economic deprivation. Several years of compensatory enrichment is necessary in order to bring these students to maturity levels consistent with mainstream developmental standards and academic expectations.

The purpose of the SMART/Boost-Up program is to produce high proportions of regular kindergarteners exhibiting first grade success indicators in early literacy and school readiness measures. SMART is not a special education program, although the program quickly identifies candidates for special needs and individual assessment. SMART/Boost-Up is a foundational research-based staff development program used in hundreds of classes in the USA at pre-K, kindergarten and primary grades to achieve this national goal of school readiness foundation for academic success. SMART/Boost-Up integrates current neuro-developmental maturation techniques into the regular curriculum to produce a “booster” effect for acquisition, retention and mastery of basic skills. SMART gives teachers the opportunity to teach more content to higher levels of mastery. Daily all-day kindergarten allows teachers to implement all SMART components to produce markedly higher proportions of student mastery than half-day schedules.

Following 3-4 days of in-service training, teachers integrate the SMART program into the current curriculum in the classroom, floor or gym and playground. The brain stimulation and input emphasis in the SMART program contrasts markedly with the typical output trials (trying/testing) approach used in the overwhelming majority of curricula and classrooms. SMART uses brain stimulation inputs that can increase exposure to sensory stimuli (content) and resulting brain activity by more than 1000%

compared to ordinary classrooms. By using heightened stimulation levels with more repetitions of the stimuli for longer duration in all senses, students' brains receive more preparation before attempting to perform. Homework assignments use the same age-appropriate brain input procedures. The results are quicker, higher quality and more confident student performance compared to students in ordinary classrooms. Heightened attention, listening, following directions, reduced distractibility and off-task behavior are also documented. More classroom time is available for teaching and learning because less time is spent on distraction and digressions.

SMART activities integrate heightened visual, auditory, vestibular and kinesthetic inputs to the brain over the course of the school year. For example, kinesthetic stimulation through arm and hand movement provides patterns of proper position and letter formation for printing quality 10-20% higher than trial and error processes.

On typical printing worksheets, for example, SMART students reverse the input/output ratios by tracing letter models 60-80 times in a lesson rather than a token 1-3 times (producing a 2000% increase of kinesthetic input). The kinesthetic sense requires a hundredfold increase of input in order to produce quality motor output (printing) equal to mid-first-grade at the end of kindergarten. The repetitions of kinesthetic input must take place in an enjoyable fun context involving color, completion and increasing complexity.

SMART provides a booster effect for achievement in most academic curricula that the teacher might choose to teach to mastery. Students achieve mastery more quickly and progress steadily through current curricula modified for readiness and sequence in early reading, math and printing skills. Foundational readiness abilities are developed systematically in listening skills for pre-phonemic awareness, visual and eye-hand coordination skills, and attention abilities that provide a solid foundation for basic academic skills. In addition certain unusual sensors are activated related to cerebellar-vestibular activation promoting quick and automatic output and heightened attention.

By helping bond students to school through consistent early success and high-level performance in a joyful context, attendance increases. The quick and easy SMART mastery of basic skills is expected to prevent later dropouts due to school failure by increase enjoyment and satisfaction through mastery of curriculum. By facilitating students' mastery of basic skills at an automatic level, SMART allows students to apply those basic skills to higher order thinking in intellectually interesting curriculum

Fifteen years of foundation and government-sponsored research in SMART/Boost-Up provide the program documentation and refinements in readiness, early literacy and mathematics programming. Research reports and descriptions of the program components are available on request.

Essential features of SMART implementation include three locations, 80-120 hours of SMART physical program and using the booster effect to teach more content to high mastery levels. SMART provides the teacher the opportunity to teach more, but it is up to the teacher to seize the opportunity. Some students need two years of SMART.

SMART/Boost-Up K-3 Results Wisconsin 2003-2004

The K-3 regular students consisted of 569 students (58.3% males) from 43 classes in rural Wisconsin Title 1 schools. Free and reduced price meals were supplied to 53% of the students. About 10% of the students were minorities, including African American, Asian American and Native American categories. About 12% of students were excluded from the data due to their status as members of the special education population. No students were excluded due to English learner status.

Table 1 displays the 2003-2004 demographic information by grades.

SMART Grade	Pupil /Teacher N	Male N	Female N	Minorities N	Free/Reduced Meals	Special Ed N Excluded
K	188/14	94/154(61%)	60/154(39%)	10+	56/154 (36%)	18+
1	120/10	66 (55%)	54 (45%)	20 (17%)	69 (58%)	19
2	131/9	67(51%)	64(49%)	15(5%)	97 (74%)	18
3	130/10	85(65%)	45(35%)	10(8%)	80 (62%)	19

Wisconsin uses the daily all-day kindergarten schedule. Regular kindergarteners are age 5 prior to September 1. Redshirts, repeaters and non-speech special education are excluded.

Except for grade 2, these classes contained unusually large proportions of males. This skewed demographic will be noted in the following summaries by grade. The number of students shown for the various tables will vary according to what data was reported.

Kindergarten Readiness for First Grade

In addition to the usual reporting of central tendencies for student groups, this project is particularly interested in the proportions of students achieving at or above normal levels. Normal range is traditionally considered to be that 50% of the norm population between Q1 and Q3, that is, between the 25th and 75th percentiles. Test items at grade level are generally selected by the ability of 75% of the population to respond correctly. When the 25% of students in the top quartile are added to the 50% of students in the normal range, 75% of the norm distribution scores above Q1 (25th percentile). Students attending Title 1 schools are considered at-risk for academic difficulties and without some effective intervention, a majority of students are expected to score in the two quartiles below the standardized mean.

Readiness for school has been America’s number one education goal since 1990. Readiness for first grade and reading instruction in this study was measured, as in the past two years, using the Metropolitan Readiness Test-6th Edition. Teachers administer the test by sections on two or more days to the entire class or to small groups of students. The combined scores for Beginning Sounds, Aural Cloze, Sound-Letter Association and Story Comprehension make up the Pre-Reading Composite.

Table 2 shows the proportions of students in the four quartiles for each of the skill areas. The Pre-Reading Composite proportions at the bottom are compared to control group quartile percentage distributions. When SMART and control students are compared for proportions scoring above and below the 50th percentile on a 2 x 2 table, the resulting chi-square is statistically significant at $p = .02$ 1-tail (with control for continuity). As expected, the 21% proportion of SMART students below the 50th percentile is significantly smaller than the 39 percent in the control group. The largest difference is in the lowest quartile where the SMART distribution shows 1/3 of the proportion of the control class. In the top quartile large differences are also apparent where, as expected, 26% of controls are present, but 43% of SMART students scored at this highest level. At least 10% more students in SMART kindergartens scored at or above Q1 due in large part to more SMART students mastering the Beginning Sounds subtest.

The SMART students placed 18% more students in the top quartile compared to the control students and 11% fewer in the lowest quartile. The SMART classes prepared significantly more students for reading than the control classes and 95% of regular SMART kindergarteners scored at or above the normal range in reading readiness. Unlike comparisons in earlier years, the proportions of SMART and control students were similar in Story Comprehension and Quantitative Concepts at this testing.

Table 2

May SMART Kindergarten Distributions for First-Grade Readiness by Quartiles
Metropolitan Readiness Test - Sixth Edition (MRT6)
N = 165/12 classes

MRT6 Areas & Composite	Percent Students in Percentile Rank Quartiles				
	1-25	26-50	51-75	76-99	%>Q1
Beginning Reading Skills Area	6	16	34	44	88
Story Comprehension Area	10	26	27	38	90
Quantitative Concepts Area	9	21	26	44	91
Pre-Reading Composite*	5	16	36	43	95
Pre-Reading Composite Control* (N = 43)	16	23	35	26	84

*Chi-square = 5.1cc, df = 1, $p = .02$ 1-tail for proportions above/below the mean. Story Comprehension and Quantitative Concepts showed nsd between groups

Kindergarten Early Literacy

The ability to quickly recognize 10 or more first-grade high-frequency words at the end of kindergarten predicts that a student will make adequate progress in reading by the end of first grade. The 37-word list from the Brigance K & 1 Screen is taught explicitly by the teachers as part of the curriculum and is tested at year-end with a 5-second-per-word limit as a curriculum-based measure. Composites of SMART classes tend to have medians of class medians of about 17 words with 65% or more of students reading at least 10 words.

Table 3 shows the median of 19 words for the 14 classes with 68% of the 188 students reading 10 or more words, a slight increase over the performance of past years. The fact that this composite contains 61% males, 10% minorities and 36% subsidized meals is noteworthy. Young males are expected to be less mature in many ways in comparison to same-age females. The males in this cohort must have scored well in order for the composite median and proportions to be high. Still, a subgroup of regular males with multiple converging at-risk variables probably requires more than one year of compensatory SMART stimulation in order to catch up with non-risk peers.

Table 3 Wisconsin SMART Project Interim Summary 2003-2004

Quick Word Recognition: Brigance High Frequency Wordlist

SMART 2003-2004	SMART Pupils/Classes N	Fall Pre-test Words Read Median Class	Fall N (%) Reading 10+ Words	May Post Words Read Median Class	May N (%) Reading 10+ Words
Daily All-Day Kindergartens	188/14	0	15 (8%)	19	127 (67.6%)
	Clayton 34/2	na	na	31	33 (97%)

37 High Frequency Words from Brigance K & 1 Screen,
5 second limit per word.

Table 3 also shows the results from Clayton Elementary School readiness team where all aspects of the SMART program are applied in exemplary and consistent ways each year. All students except one met the 10-word recognition goal and more than half the students recognized 30 or more words. All Clayton regular students scored above the mean on the MRT6 Pre-Reading Composite. These students have both high levels of readiness and literacy and are apparently overcoming any at-risk variables present at school entry.

Table 4 displays the proportions of pupils at or above the normal range on a standardized test of pre-phonemic auditory discrimination. This phonemic awareness skill is a readiness component for phonetic word attack skills. Of 154 pupils tested, 80% scored above Q1 and 70% scored above the national mean. The standard score median is the equivalent to the 64th percentile. For reasons yet to be determined, the Clayton model SMART classes

scored slightly lower than the composite of the other 12 classes. The Clayton distribution shows 26.5% of students (N = 9) scoring in the lowest quartile as predicted by the national norms. Without fall pre-test scores for the earlier status of these students these lower scores can only invite questions as to the causes of the differences between groups.

Table 4 Wisconsin SMART Project Interim Summary 2003–2004

Phonemic Awareness: Auditory Discrimination

Kindergarten Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) at Mean+
154/12	101	98 (63.6%)	106	123 (80%)	108(70%)
Clayton 34/2	NA	NA	106	25 (73.5%)	21 (62%)

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Overall, large proportions of students scored above Q1 and especially above the mean in this pre-phonemic awareness ability of phoneme discrimination. The classes were very close to the project goal of 80% of students above Q1.

Table 5 shows the high proportions of students with 60% early first-grade printing quality. Again, the proportions of students approach the 80% project goal.

Table 5 Wisconsin SMART Project Interim Summary 2003–2004

CBA Print Quality: % for letter recognition, control, alignment

SMART 2003–2004 Kindergartens	SMART Pupils/Classes N	May Post Print Quality % Median	May N (%) 60%+
Daily All-Day K	181/13	72%	76.80%
	Clayton 34/2	88%	34 (100%)

60% quality is fall first grade quality

SMART Readiness for Kindergarten

Again, readiness for school is America’s number one educational goal. Some children are identified as at-risk for academic failure or difficulty prior to kindergarten. Some districts operate half-day pre-kindergarten programs that can function as inclusive environments for young children with disabilities (IEP) and general immaturity/ deprivation. The SMART neuro-educational systematic stimulation at sensory and pre-academic readiness levels provides a compensatory enrichment that is integrated in age-appropriate and fun ways with the pre-k curriculum.

In May, the Metropolitan Readiness Tests - Sixth Edition (Level 1) was administered individually to each pupil by the teacher and the results for the Pre-Reading Composite are shown here. Table 6 combines data from two years and four teachers in order to create a composite of 97 students that is large enough for generalization. Redshirts (students one year older than peers) are excluded from these data.

Table 6 shows that only 63% of the pupils, instead of the normal projection of 75%, scored above Q1 at the end of the year. The median standard score of 93 is equivalent to the 36th percentile. The medians below the mean of 100 and smaller proportions in the normal range reflect the lower function of many of these students. These children will benefit from receiving a second year of SMART in kindergarten and a third year in first grade.

Table 6

MRT6(1) Pre-Reading Composite Proportions
Half-Day Pre-Kindergarten Classes
Rural Wisconsin Title 1 schools
May 2003/May 2004

Half-Day Classes	N	Median St. Score	Median Percentile	N > SS 89 (25 th percentile)
Grantsburg				
A AM 2003	12	91	27	7
H AM 2003	18	98	45	14
A AM 2004	16	96	39	12
C AM 2004	15	94	34	10
C PM 2004	17	90	25	8
Turtle Lake 2003	19	93	32	13
Totals	97	93.5 Med	32	64 (63%)

Metropolitan Readiness Tests – Sixth Edition (Level 1) individually administered
MRT6(1) Pre-Reading Composite Standard Scores (Mean = 100, SD = 15)

Table 7 displays, for comparison, the composite summary of four classes conducted by a single master teacher in the model SMART program in the Title 1 Clayton Elementary School. Although 41% of the students received a subsidized meal before the class began, indicating low SES/economic disadvantage/deprivation, Amazingly, 100% of regular students scored above the mean at year end; they were all above average. These students demonstrate

extremely high levels of reading readiness skills for their age and background, resulting from the SMART compensatory enrichment.

Table 7
MRT6(1) Pre-Reading Composite
Half-day Pre-Kindergarten Classes
Rural Clayton, WI Title 1 School
May 2003/May 2004

Half-day Classes Clayton, WI	N	Median St. Score	Median Percentile	N > SS 89 (25 th percentile)
AM 2003	12	127.5	96	12
PM 2003	10	118	88	10
AM 2004	12	121	92	12
PM 2004	19	121	92	19
Totals	53	121Med	92	53 (100%)

All students scored above the national mean (above 50th percentile)
Metropolitan Readiness Tests – Sixth Edition (Level 1)
MRT6(1) Pre-Reading Composite Standard Scores (Mean = 100, SD = 15)

Word Recognition and Phonemic Awareness for Grades 1-3 in Title 1 Schools

All but a few of the students in grades 1-3 were experiencing their second year of the SMART program. The students were accustomed to the schedule and activities, and the teachers had seen the encouraging results of their efforts in year 1, were experienced in the physical movement aspects of the program and had experience in integrating the stimulation activities into existing academic curriculum to create a fun and joyful climate related to mastery.

Students with special needs were excluded from the analyses because SMART/Boost-Up is considered to be a program for regular students. Students in special education (IEP) are therefore excluded except for students receiving services in the area of speech and hearing. Other students excluded from analysis are late transfers, and students with low English proficiency (LEP/ESL). Students receiving Free and Reduced Meals (Low SES) are included. A small proportion of students of minority races (<8%) are included, as well as transfers. Results are presented in tables for each grade with a summary at the bottom of the page.

The Slosson Oral Reading Test-Revision 2 (SORT-R2) is a word list for quick (5-second limit) word recognition of words in isolation that is administered individually to each student. The SORT-R2 reports standard scores with a mean of 100 and standard deviation of 16. The SORT-R2 is a test that is economical and efficient in terms of the time and effort required to administer and analyze scores. Scores above 90 are considered in the normal range while scores of 90 and below are in the lowest quartile.

First Grade SMART Results

Table 8 summarizes data on 120 first-graders in 9 classes, in which 87% of the students are above Q1 in May and 67% are above the national mean. These proportions are at the expected level for this project and are consistent with past results of SMART enrichment.

Table 8 Wisconsin SMART Project Interim Summary 2003–2004

Quick Word Recognition: Slosson Oral Reading Test – R3 Wordlists

Grade 1 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
120/9	87	58 (38%)	103	104 (87%)	80 (67%)
Grade Equiv.	K.2		1.9		
%ile Equiv.	21		57		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Table 9 shows that more than 97% of these first-graders scored above Q1 in the auditory discrimination phonemic awareness ability. In addition, 83% scored above the norm mean and the median for classes is the 75th percentile. Since these students had received SMART stimulation in kindergarten, the fall proportion scoring above Q1 was a high 81%. The first-grade teachers maintained and increased the pre-phonetic listening abilities of these students. The listening skills of the students are at high levels for word attack when encountering unfamiliar words.

Table 9 Wisconsin SMART Project Brief Summary 2003–2004

Phonemic Awareness: Auditory Discrimination

Grade 1 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
120/9	108	97 (81%)	111	117 (97.5%)	100 (83%)
%ile Equiv.	69		77		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Second Grade SMART Results

Table 10 shows that 95% of the 131 SMART students scored above Q1 in May word recognition and an impressive 79% scored at or above average after only 52% scored above Q1 in the Fall. The median class standard score of 109 is at the 71st percentile and half the students scored higher.

Table 10 Wisconsin SMART Project Interim Summary 2003–2004

Quick Word Recognition: Slosson Oral Reading Test – R3 Wordlists

Grade 2 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
131/9	101	68 (52%)	109	124 (95%)	103 (79%)
%ile Equiv.	52		71		
Grade Equiv.	1.8		3.6		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Table 11 indicates that these 54 regular second-grade SMART students with previous SMART experience in Title 1 schools maintained high proportions of auditory discrimination abilities from 89% of students above Q1 in the Fall to 94% in the spring. An impressive 94% of students scored above average in the spring. The standard score of 111 is the equivalent of the 75th percentile and half the students scored at this level or higher in both fall and spring.

Table 11 Wisconsin SMART Project Interim Summary 2003–2004

Phonemic Awareness: Wepman Auditory Discrimination Test

Grade 2 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
54/4	111.5	48 (89%)	111.5	51 (94%)	48 (89%)
%ile Equiv.	77		77		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Almost all of these students have the foundational listening skill for phonetic word attack when reading unfamiliar words.

Third Grade SMART Results

Table 12 shows that 82% of the 132 third-grade SMART students scored above Q1 in May word recognition and 59% scored at or above the norm mean. The median class standard score of 107 is at the 67th percentile and half the students scored higher. The project goal of 80% of students scoring above Q1 was met at grade 3. In terms of grade equivalence, the median moved from grade 3.4 in September to 4.9 in May, and increase of 1.5 years after two or more years of the SMART program.

Table 12 Wisconsin SMART Project Interim Summary 2003–2004

Quick Word Recognition: Slosson Oral Reading Test – R3 Wordlists

Grade 3 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
132/10	98	98 (74%)	107	108 (82%)	78 (59%)
%ile Equiv.	45		67		
Grade Equiv.	3.4		4.9		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Table 13 data on 85 regular third graders in 7 classes reporting auditory discrimination data. These students with previous SMART experience in Title 1 schools maintained high proportions of auditory discrimination abilities from 91% of students above Q1 in the Fall to 89% in the spring. A large proportion of 81% of students scored above the norm mean in the spring. The fall standard score is equivalent to the 70th percentile. The May standard score of 112 is the equivalent of the 77th percentile and half the students scored at this level or higher. These third graders have high abilities in noticing phoneme differences that are the foundation for phonetic word attack and vocabulary development. These students in Title 1 schools are achieving at levels expected of students from advantaged environments

Table 13 Wisconsin SMART Project Interim Summary 2003–2004

Phonemic Awareness: Wepman Auditory Discrimination Test

Grade 3 Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) Above Mean
85/7	108.5	77 (91%)	112	76 (89%)	69 (81%)
%ile Equiv.	70		79		

Standard Score: Mean = 100, SD = 15, Q1 = 90.

Summaries of SMART Word Recognition and Auditory Discrimination Results

Tables 14 and 15 summarize the data presented in Tables 8-13 for visual comparison of grades 1-3. In Table 14, fall first grade word recognition scores are expected to be low for Midwestern students tested in September, and especially with students from Title 1 schools. The May post-testing for all grades, however, shows consistent increases in high median standard scores and high proportions of students above Q 1. In addition, the proportions of students above the national mean are an impressive 60-79%.

Table 14 Wisconsin SMART Project Brief Summary 2003-2004

Quick Word Recognition: Slosson Oral Reading Test – R3 Wordlists

2003-04 SMART Grades	SMART Pupils/Classes N	Fall Pre-test Standard Score Median	Fall N (%) Above Q1	May Post Standard Score Median (%ile)	May N (%) Above Q1	May N (%) At Mean+
1	120/9	87	58 (38%)	103 (57%ile)	104(87%)	80 (67%)
2	131/9	101	68 (52%)	109 (71%ile)	124 (95%)	103 (79%)
3	130/10	98	98 (75%)	107 (67%ile)	108 (83%)	78 (60%)

SMART-R3 Standard Score: Mean = 100, SD = 15, Q1 = 90. Skill: Word recognition within 5 seconds. Q1= 25th percentile; 75% of students expected to score above Q1 according to standardized norms Mean = 50th percentile; 50% of students expected to score above the standardized norm mean

Table 15 displays the pre-post medians in grades 1-3 by grade level equivalent for progress and proportions of students at each grade above Q1 and above the mean. The May grade equivalent for word recognition rises about 1.5 years at each grade level so that by the end of third grade the median is about a year ahead of the grade enrolled and half of the students scored at higher levels yet.

Table 15
SMART Word Recognition Pre-Post Grade Equivalent Medians
Wisconsin Rural Title 1 Schools 2003-3004
Slosson Oral Reading Test – R3 Wordlists

Grade	Median Class Grade Equivalents		Pupil Percentage above 25 th %ile		Pupil Percentage 50 th %ile+
	Fall	May	Fall	May	May
1	K.2	1.9	38	87	67
2	1.8	3.6	52	95	79
3	3.4	4.9	74	82	60

Table 16 summarizes the auditory discrimination increases in standard score medians, the proportions of students above Q1 and the proportions of students above the national mean. Students at all levels advanced in standard scores except at grade 2 where the standard score of 111 was already at a very high level. The standard score at the beginning and end of the school year indicates that a year of growth occurred and this growth is verified by the increase in proportion of students above Q1. Year-end proportions of students above Q1 were above 80% in all grades. The kindergarteners have had only one year of SMART stimulation, but as the children advance through the grades and the effects of more than one year of SMART are demonstrated in the increase in standard score medians and proportions of students at average and high levels of ability. By the end of third grade when the basics of reading have been taught, these students are demonstrating high proficiency levels comparable to advantaged peers.

Table 16 Wisconsin SMART Project Interim Summary 2003–2004

Phonemic Awareness: Wepman Auditory Discrimination Test

SMART Grades	Pupils/Classes N	Fall Pre-test Standard Score Median Class	Fall N (%) Above Q1	May Post Standard Sc. Median Class	May N (%) Above Q1	May N (%) At Mean+
K	141/10	101	76 (59%)	106	137 (85%)	122(75%)
1	120/9	108	97 (81%)	111	117 (97.5%)	100 (83%)
2	54/4	111.5	48 (89%)	111.5	51 (94%)	48 (89%)
3	85/7	108.5	77 (91%)	112	76 (89%)	69 (81%)

Standard Score: Mean = 100, SD = 15, Q1 = 90.

The extremely high levels of proficiency in subtle phonemic listening skill is due to a combination of SMART programming aspects: (1) the cerebellar-vestibular sensory enrichment increases the focus of attention and promotes ignoring of possible distractions in the environment; (2) the repeated listening to exotic music enriches and develops the sense of melody, timbre (tonal color), rhythm, harmony, etc); (3) the teacher’s expansion of vocabulary, especially when words sound similar but are different in subtle ways attune the ear to “tricky” differences; (4) teacher modeling of explicit similar-sounding words that are defined for the pupils expand awareness of possible differences in commonly used words such as vowels (ladder/letter/litter, peck/pick/pack, sat/set/sit), consonants (wail/whale, a dress/address, which/witch), diphthongs (toy/toe, quiet/quite, suit/suet), and consonant blends (crutch/crunch, spot/stop, fruit/flute).

The usual interrogating (Questioning/testing/drilling) of students is counterproductive because of the increase in anxiety, guessing, and competition (premature responding) to be first to give a response. Brief daily instruction/modeling/ explaining by the teacher to attentive and receptive pupils is a gentle, easy, effective and brain compatible approach that assures mastery over time without disappointment or desperation. Calling attention to and defining similar-sounding individual words as they are encountered during the day demonstrates the usefulness of careful listening to avoid misunderstandings. Whether in one school year or over several grades, students increase their auditory discrimination abilities with expanding vocabulary and introduction to other languages. The SMART program stimulates at both the sensory/sound sensation level and the cognitive language level with many other phonemic awareness skills already present in the curriculum.

Table 17 displays the high auditory discrimination abilities produced by the SMART program. Median percentile equivalents approach the 80th percentile and proportions of students scoring above Q1 and above the national mean (50th percentile) are all above the 80% proportion of students set as the goal of this project.

Table 17
 SMART Auditory Discrimination Pre-Post Medians & Percentiles
 Wisconsin Rural Title 1 Schools 2003-3004
 Wepman Auditory Discrimination Test

Grade	Median Class Percentile Equivalents		Pupil Percentage above 25 th %ile		Pupil Percentage 50 th %ile+
	Fall	May	Fall	May	May
1	69	77	81	97.5	83
2	77	77	89	94	89
3	70	79	91	89	81

At third-grade level there is the possibility of a cumulative effect of lower performance by transferring students. That is, some students without previous SMART stimulation experience may have transferred into a school at the beginning of the year, producing the possible effect of lower scores at the end of the year compared to students with several years of readiness phonemic awareness stimulation. Schools with high levels of pupil mobility are particularly vulnerable to the effects of program discontinuity. If a transferring student takes two years to acclimate to the new environment, to feel at home, to feel relaxed and belonging/fitting in and fully participating, then pupils who move often have little hope to benefit from SMART activities until they become understood as universal components of summer, before school and after-school enrichment opportunities. Also, parent training may be offered for highly mobile families with at least one parent willing to oversee a basic set of activities. Another slight trend seen in the data in Table 17 is the summer setback in which fall scores are slightly lower than May scores of the previous grade, Summer SMART works!

Conclusions

The preceding tables can be reduced to the following statements regarding readiness and early literacy, all of which apply to these SMART students in rural Midwestern Title 1 schools.

20 SMART readiness questions answered:

- *95% of SMART K students scored above Q1 on MRT6 Pre-Reading Readiness Composite
- *Only 5% of SMART K students scored in the lowest quartile on the Pre-Reading Composite
- *p = .02 statistically significant advantage on Pre-Reading Composite SMART vs. controls
- *19-word median for SMART K reading high-frequency words
- *68% of SMART K students read at least 10 words, predicting good reading in first grade
- *97% of Clayton SMART K students read at least 10 words
- *30-word median for high-frequency words at Clayton SMART K model program
- *80% of SMART K students scored above Q1 in auditory discrimination skill
- *77% of SMART K students printed at first semester first grade-level in May
- *100% of Clayton SMART K students printed with first-grade 60% CBA quality
- *63% of SMART Pre-K at-risk students scored above Q1 on MRT6 Pre-Rdg Composite
- *100% of Clayton SMART Pre-K at-risk students above Q1 on MRT6
- *82-95% of SMART students in grades 1-3 >Q1 in SORT-R3 Word Recognition
- *60-79% of SMART students in grades 1-3 scored > national mean in Word Recognition
- *79-89% of SMART students in grades 1-3 >Q1 in auditory discrim. phonemic awareness
- *81-89% of SMART students in grades 1-3 scored .>national mean in aud. discrimination
- *1 or more year of progress in word recognition was made by these students scoring >Q1
- *4.9 grade level median for SMART third grades in SORT-R3 word recognition
- *1.5 year median progress in word recognition on SORT-R3 per year of SMART
- *High SMART class medians/pupil proportions = advantaged peers in word recognition and auditory discrimination phonemic awareness skills according to norms.

Multiple years of SMART appear to provide substantial compensatory enrichment for students attending rural Title 1 schools.

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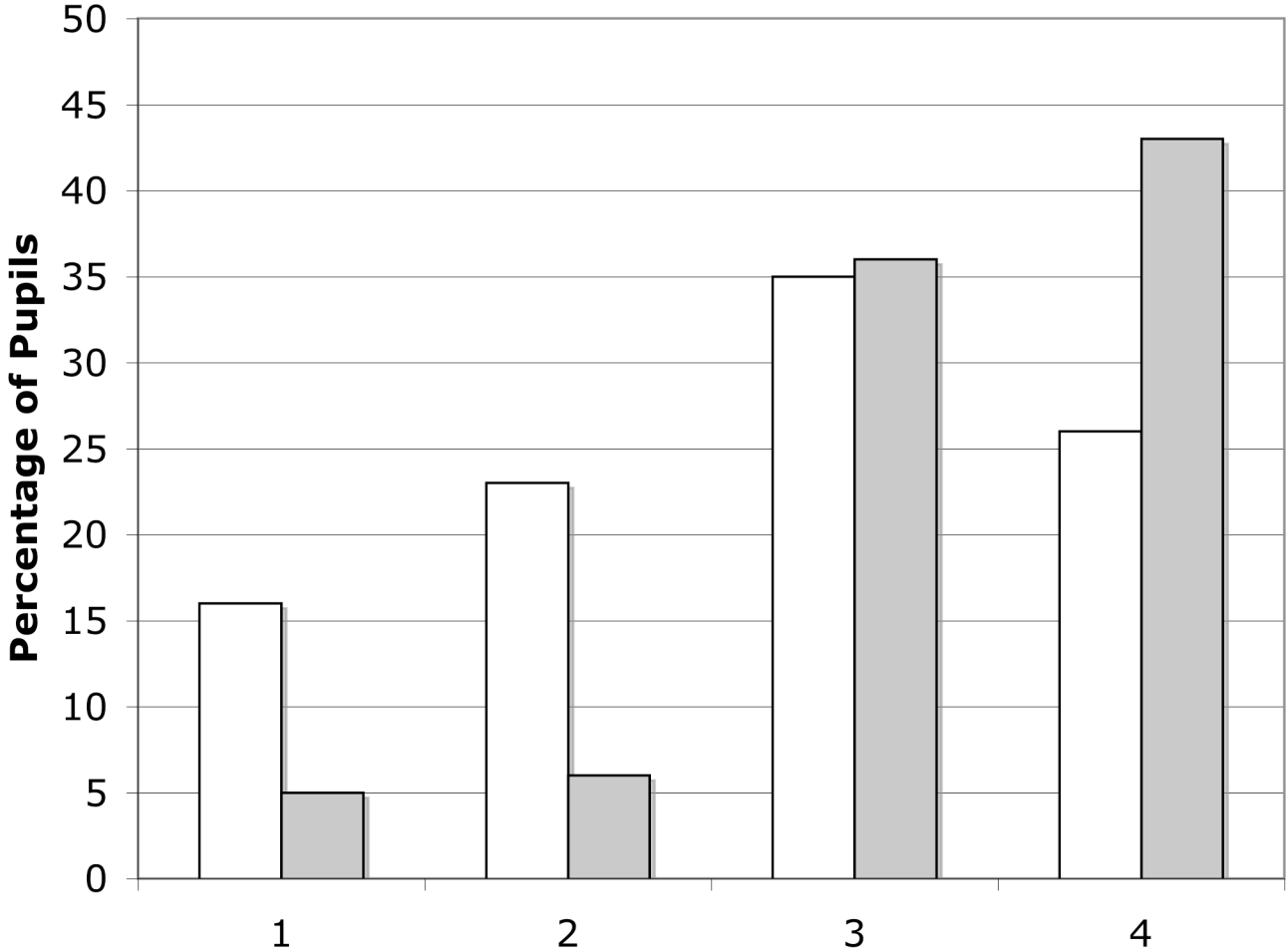
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SMART Kindergarten-Control Distributions MRT6 Pre-Reading Composite

Wisconsin Rural Title 1 Schools,
May 2004

SMART N = 165, Control N = 43



SMART MRT6 Quartiles (Control unshaded)

Percentiles 1-25, 26-50, 51-75, 76-99

2x2 Chi Square = 5.17cc, df=1, p=.02