

Executive Overview

**Early Literacy Champions In North Carolina:  
Accelerated Learning Documentation for K-3 SMART  
(Stimulating Maturity through Accelerated Readiness Training)**

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Abstract

Early literacy Word Recognition and Auditory Discrimination summaries are reported for regular males (N=154) and females (N=134) in 17 North Carolina K-3 classes integrating SMART brain stimulation activities into regular Title 1 school curricula. Dis-aggregation of distributions for Economic Disadvantage and Racial Minority at-risk categories show large proportions (90%-100% of students ) of male and female pupils scoring at or above normal levels on the *Brigance K & 1 Screen 37* common words at the end of kindergarten, and the *Slosson Oral Reading Test-R3* (SORT-R3) in grades 1-3. Medians of quick word recognition were 30 words in kindergarten and percentile equivalents of 62<sup>nd</sup> to 81<sup>st</sup> percentiles in grades 1-3. Male minority students and kindergarten males with summer birthdays scored similar high levels and proportions with almost all students scoring at or above the normal range in May. Kindergarten curriculum-based measurement of printing quality indicated that 60%-73% of May kindergarteners scored at mid-grade 1 level.

The *Wepman's Auditory Discrimination Test* (WADT) documented high levels of this phonemic awareness foundational skill. Comparison of quick word recognition and auditory discrimination maturity in K-2 classes revealed 79%-92% of pupils mature in both abilities with only one or two pupils mature in only one. Pre-post scores are shown for grades 1-3 and for WADT in kindergarten. These extremely high mastery levels of early literacy are consistent with previous SMART results with students who are at-risk for school difficulties.

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This project was supported in part by US Department of Education PR/Award Number Award #U282U030013 (\$950,451) – Field-Initiated National Activities Projects (\$950,451), through the Minnesota Learning Resource Center. Federal funding does not infer endorsement of the program or opinions expressed in this report.

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**Introduction**

Champion:

*(v) To advocate, model, uphold, support, envision, lead to success  
(adj/n) Best, showing outstanding superiority, enthusiasm, activism, energy*

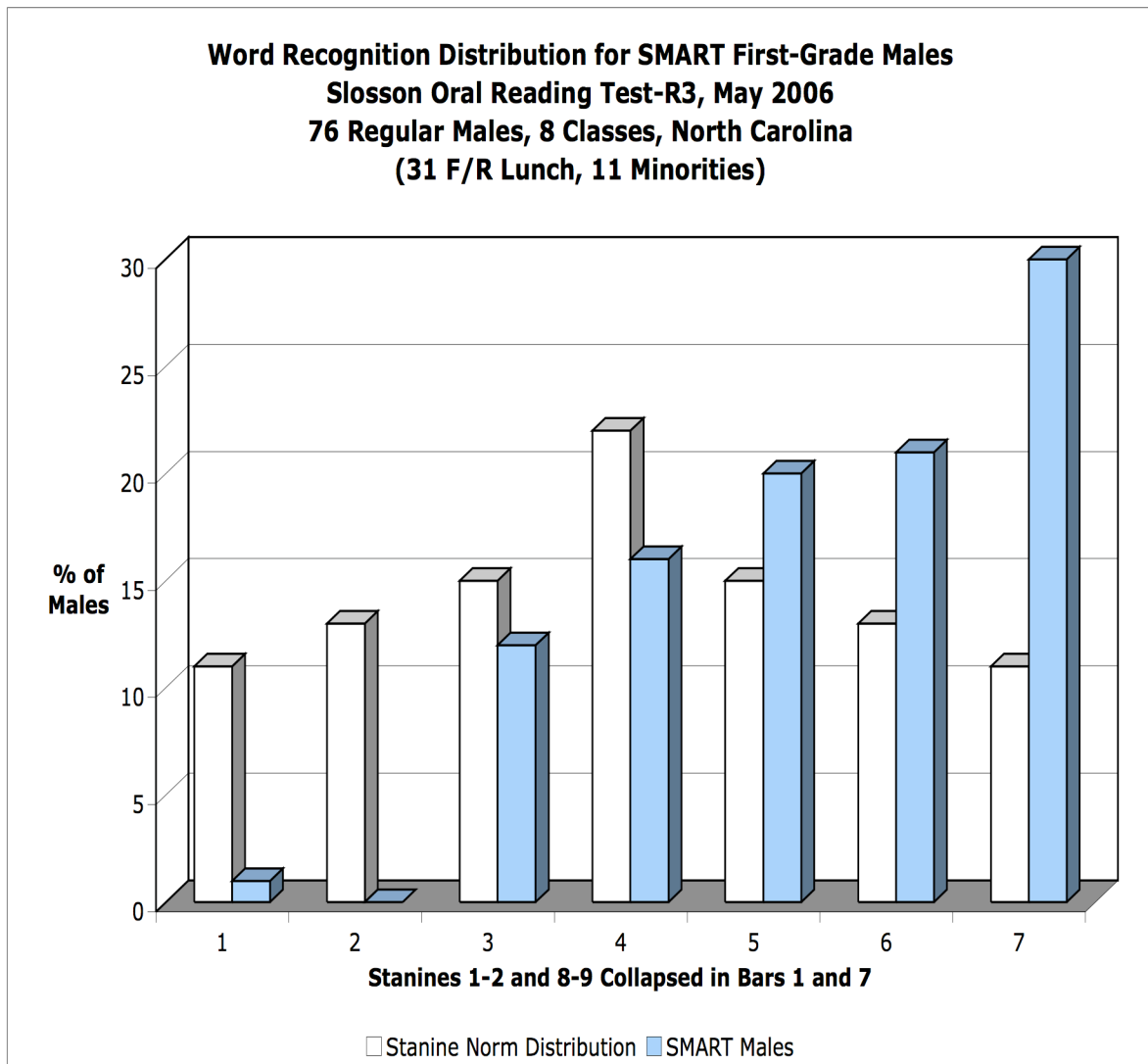
This overview summarizes the 2005-2006 school year results for K-3 teachers in four North Carolina school districts using SMART (Stimulating Maturity through Accelerated Readiness Training) in Title 1 schools. The SMART staff development goal is to produce solid and high-level foundations of readiness and early literacy mastery at automatic response and application levels for at least 80% of students, including those at-risk for school difficulties because of low income, gender and/or racial minority status. The SMART program produces consistent high-performance mastery of readiness and basic skills across classrooms at the same level as the occasional individual master teacher. Federal, state, legislative and foundation grants over the past decade funded documentation of high proportions of students achieving at or above the normal range of normed and curriculum-based measures. SMART is probably the most effective K-2 early childhood booster program at present with trainees attending week-long training from many states and countries preparing to link current knowledge of brain stimulation to the traditional and typical early childhood curricula.

SMART is a systematic integration of brain stimulation and enhancements into the regular curriculum for the purpose of producing results generally achieved only by master kindergarten teachers. By demonstrating that high success levels are attainable consistently, these teachers are, in effect, "champions" of dynamic child development that includes neuro-activation for brain plasticity in school settings. Teachers are trained in classroom brain stimulation processes and procedures during a 4-day staff development seminar. Monthly visits by mentors coach teachers on SMART implementation and measurement. Schools organize grade-level teams to concentrate on general classroom and individual stimulation, problem-solving suggestions, and measurement of effectiveness using curriculum-based and standardized tests.

SMART early reading results with students "at-risk for academic difficulties" have attracted state, federal and foundational financial support for SMART research at the non-profit Minnesota Learning Resource Center in Minneapolis. MLRC reports include experimental and quasi-experimental scientific studies of outstanding early academic, readiness and physiologic maturity. Males, low-income males and males of racial minority status (black males, especially) comprise the groups most in need of proven programming to assure automatic mastery of basic skills in the primary grades as the foundation for intermediate and secondary school success. Graph 1 conveys both the goal and results expected for at-risk students experiencing quality SMART programming.

The 7 white bars in Graph 1 represent the percentages of students expected in the standardized normal curve distribution for quick reading recognition at the end of first grade (stanines 1 & 2, 8 & 9 are collapsed). The blue bars represent the reading distribution for 76 males in the North Carolina SMART first grade classes. Half of these regular males scored above the 75<sup>th</sup> percentile (bars 6 and 7) and only one student scored below the 25<sup>th</sup> percentile (bar 1). Quick recognition of words in isolation (within 5 seconds) on the nationally-standardized **Slosson Oral Reading Test-R3** is only one example of the benefits produced by teachers trained to use SMART human technology. This graph is emblematic of the SMART opportunity to achieve the goal of every parent, teacher and administrator at the elementary/primary level: that every regular student read at an automatic mastery level at the end of first grade.

Graph 1



SMART can increase school readiness and mastery of basic skills in at-risk populations of economically disadvantaged, racial minorities, especially males, although more than one year of stimulation is required for some children. SMART is a general education program, although many children with special needs respond well to individualized applications of various components.

SMART stimulation takes place in three structured locations where enjoyable stimulation procedures are integrated into current curricula, activities, schedule and equipment uses:

- (1) Classroom areas, including ceilings, walls, floors, hallways, desks and tables.
- (2) Floor, hallway and/or Physical Education space, and
- (3) Playgrounds and playground equipment,

Vestibular stimulation, for example, involves exciting and enjoyable daily head and body rotations that stimulate noticeably higher levels of attending ability (sustained attention). By systematically encouraging and directing fun-filled activities of balance and movement that activate the vestibular and other sensors, students experience huge increases in amounts of stimulation and neuro-developmental growth compared to students in traditional classes. By integrating a variety of neuro-stimulators into currently-used early academic and readiness curricula, higher levels of content acquisition and retention are possible and measurable. SMART represents a new standard of developmental readiness building on the advancements of neuroscience over the past 50 years.

Stimulation of immature, retained primitive reflexes removes much discomfort that children exhibit in unusual seat and desk postures that are so often observed in classrooms today. By removing these barriers to concentration and attention, students are able to develop sustained attention and complete assignments in a relaxed rather than an uncomfortable and anxious state.

**North Carolina 2005-2006 SMART:  
Record Readiness and Reading in Early Childhood  
Demographic Characteristics of Students**

The 154 regular males and 134 regular females were age-appropriate for grades enrolled in schools located in west central North Carolina. A few overage students and those in special education were excluded as follows (K: 1 male, 1<sup>st</sup>: 2 males, 3 females; 2<sup>nd</sup>: none; 3<sup>rd</sup>: 1 male; total 4 males, 3 females). Pupils receiving free/reduced meals were classified and analyzed separately as economically disadvantaged. Analysis of findings involved reporting disaggregated populations by grade according to the various measures as shown below in Tables 1 and 2:

Table 1 NC 2006 SMART Classes

6 kindergarten classes (5 years of age by Sept. 1; 6-year-olds excluded)
(48 regular males, 33 economically-disadvantaged, 15 minority)
(50 Regular females, 24 economically-disadvantaged, 13 minority)
8 first-grade classes
(76 regular males, 31 economically-disadvantaged, 11 minority)
(64 regular females, 21 economically-disadvantaged, 11 minority)
2 second-grade classes
(19 regular males, 10 economically-disadvantaged, 2 minority)
(12 regular females, 6 economically-disadvantaged, 1 minority)
1 third-grade class
(7 regular males, 2 economically-disadvantaged, 1 minority)
(8 regular females, 2 economically-disadvantaged, 0 minority)
17 Total K-3 classes

Further analyses isolated 22 kindergarten males (18 EcDisadv, 6 minorities) with summer birthdays, and the proportions of K-1 students with both mature reading and phonemic awareness (auditory discrimination) maturity.

Table 2  
**SMART Kindergarten**  
**Demographic Summary**  
 6 Classes, North Carolina  
 September, 2005

Descriptors	48 Males	50 Females
Chronological Age		
CA Medians*	5.3-5.4	5.2-5.45
CA Ranges	4.8-5.9	4.8-5.9
HFD Features		
Medians*	7 to 9	8.5 to 10
Ranges	0 to 19	0 to 22
% Pupils 1+	44-47	46-54
Subgroups*		
Econ Disadv N	33, 15	24, 10
% Total	69, 31	48, 20
Racial Minorities		
Black N*	10	10 to 13
Hispanic N*	3 to 4	2
Mixed N	1	2
% Total	31	34

\*Incidence varies according to group/subgroup: Economically-Disadvantaged, Racial minority

Kindergarten demographics shown in Tables 1 and 2 indicate that chronological age medians were slightly younger than the typical 5.5 years at September entry and that mental ability (Human Figure Drawings) scores were slightly lower than the expected 10-point median. As a total group, these children were slightly less mature chronologically and mentally than typical kindergarteners. The 22 male kindergarteners with summer birthdays (18 economically-disadvantaged, 6 minorities) were lower still with a median of 6 points on the Human Figure Drawing. These data clearly show that these students were not from culturally or economically-advantaged backgrounds. About half of the kindergarteners are estimated to have had Head Start experience, although the September data indicates that the students' kindergarten entry performance is slightly below expectation. Readers are reminded that students with special needs are excluded from these populations (K: 1 male, 1<sup>st</sup>: 2 males, 3 females; 2<sup>nd</sup>: none; 3<sup>rd</sup>: 1 male; total 4 males, 3 females).

## Results in Word Recognition and Auditory Discrimination

Teachers administered end-of-year assessments of quick word recognition (5-second limit) using the **Brigance K & 1 Screen (Brigance)** list of 37 high-frequency words in kindergarten, and the **Slosson Oral Reading Test-Revision 3 (SORT-R3)** in grades 1-3. Kindergarten printing quality using a curriculum-based measure of quality percent included recognition of the letter, orientation to lined paper and smoothness of lines for coordination control. The foundation for phonemic awareness was measured using the nationally-standardized **Wepman's Auditory Discrimination Test (WADT)** using 30 similar-sounding word-pairs containing a difference of only one phoneme (and 10 control pairs that were repeated words). These highly efficient measures predict achievement levels later reading skill mastery. Disaggregated median standard scores (with percentile equivalents) and quartile distributions are reported in order to provide the most practical information to administrators and teachers.

A quick way to comprehend the outstanding results produced by these teachers is to view the data as distribution graphs using quartile bars to display the fact that half or more of the students consistently score at the highest level. Few or none of these regular students score in the lowest quartile. This pattern of results is found consistently in grades 1-3 as shown in the following graphs. A rise in proportions of students above the national mean is common for classes receiving multiple years of SMART programming

### Kindergarten

Outstanding May kindergarten early literacy performance is shown for all categories of disaggregated students in Tables 3 and 4. The national expectation of quickly recognizing and calling aloud at least ten words from a list of 37 high-frequency words is far surpassed with class medians at about 30 words.

Proportions of students reading 10 or more words were 92-100% for the subgroups, and 64-82% read 26 or more words, indicating that at least 2 of 3 of both males and females recognized extremely high numbers of words by the end of kindergarten. While a score of 18-25 words read is outstanding, both male and female medians for the SMART classes were at 30 or more words for all subgroups.

Kindergarten males with summer birthdays also scored high with 21 of 22 males reading at least 10 words, and 64% read 28 or more words with a median of 28.5 words.

Print quality was also high. Regular kindergarten print quality is often at 55% or lower, whereas the medians for the SMART subgroups ranged from 71-84% quality with 58-80% of males and females scoring at or above mid-first-grade level, At least 3 of 5 males and 3 of 4 females scored at mid-year grade 1 in print quality.

Graphs 2-3 display the male and female May kindergarten distributions for word recognition.

Table 3

**Male SMART Kindergarten Early Literacy Performance  
6 North Carolina Classes, May 2006**

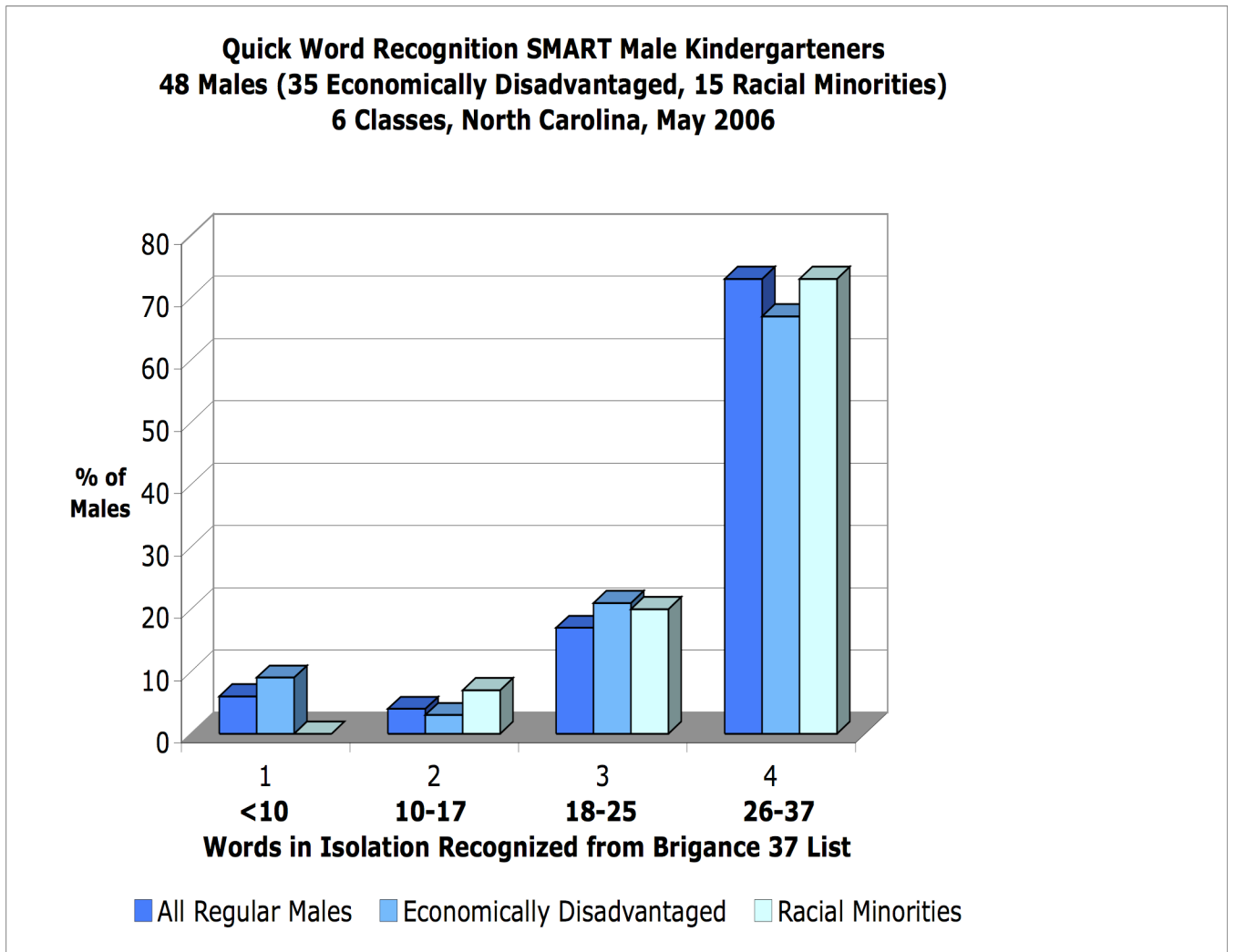
Measures	Population Subgroups			
	% Regular N=48	% Economic Disadvantage N=32	% Racial Minority N=15	% Summer Birthdays N=22
Words Recognized Of 37				
Median Words Read	31	30	32	28.5
Proportions of Pupils				
<10 words	5.2	9.1	0	4.6
10+ words	93.8	90.9	100	95.4
18+ words	89.6	87.9	93.3	86.4
26+ words	72.9	66.7	73.3	63.7
Printing CBM				
Median Quality %	73.5	71	78	83.5
% Ss>Gr 1.4	60.4	57.6	80	72

Table 4

**Female SMART Kindergarten Early Literacy Performance  
6 North Carolina Classes, May 2006**

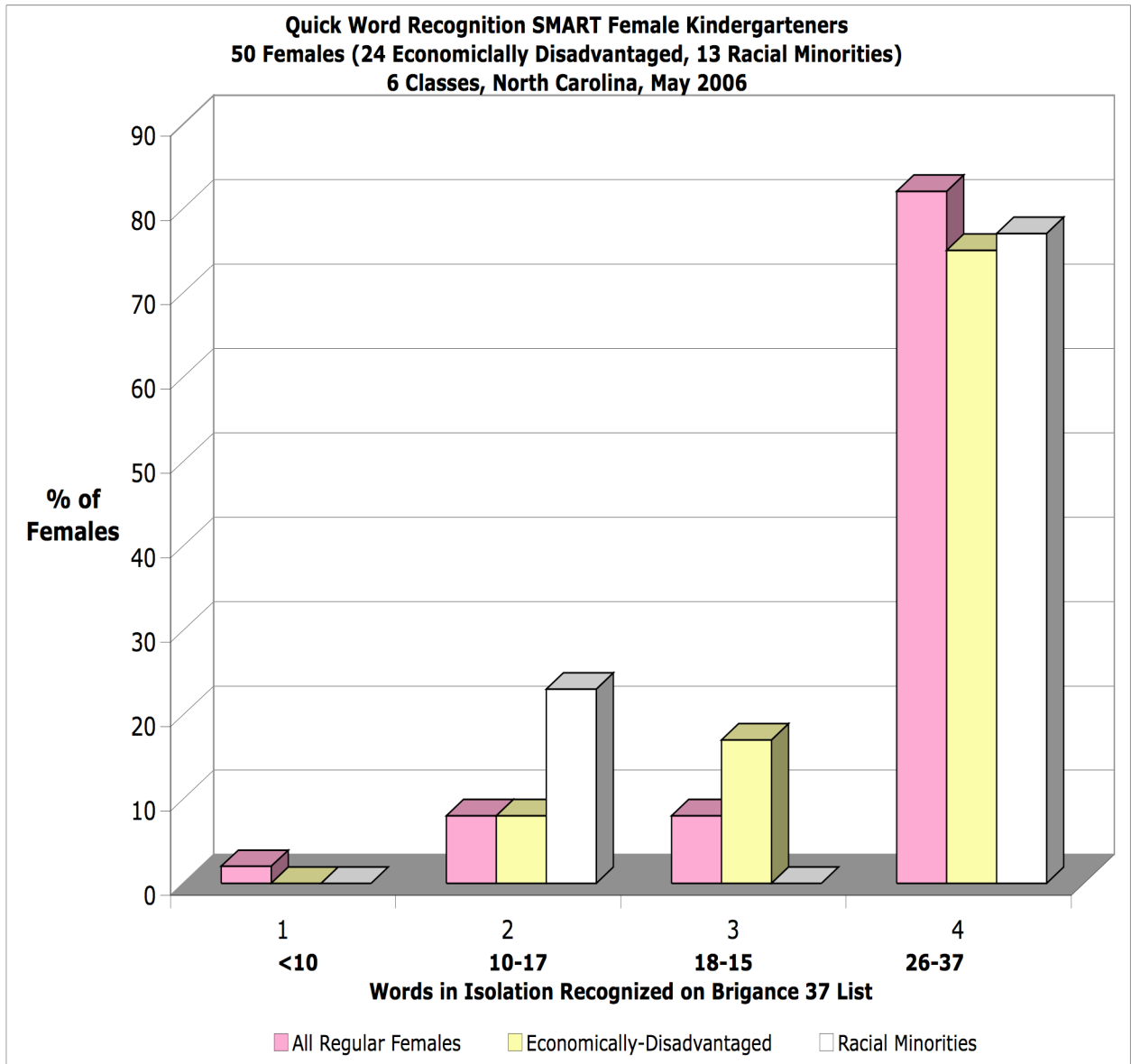
Measures	Population Subgroups		
	% Regular N=50	% Economic Disadvantage N=24	% Racial Minority N=13
Words Recognized Of 37			
Median Words Read	33	31.5	32
Proportions of Pupils			
<10 words	2	0	0
10+ words	98	100	100
18+ words	90	91.7	76.9
26+ words	82	75	76.9
Printing CBM			
Median Quality %	78.5	84	77
% Ss>Gr 1.4	78	75	76.9

Graph 2





**Graph 3**

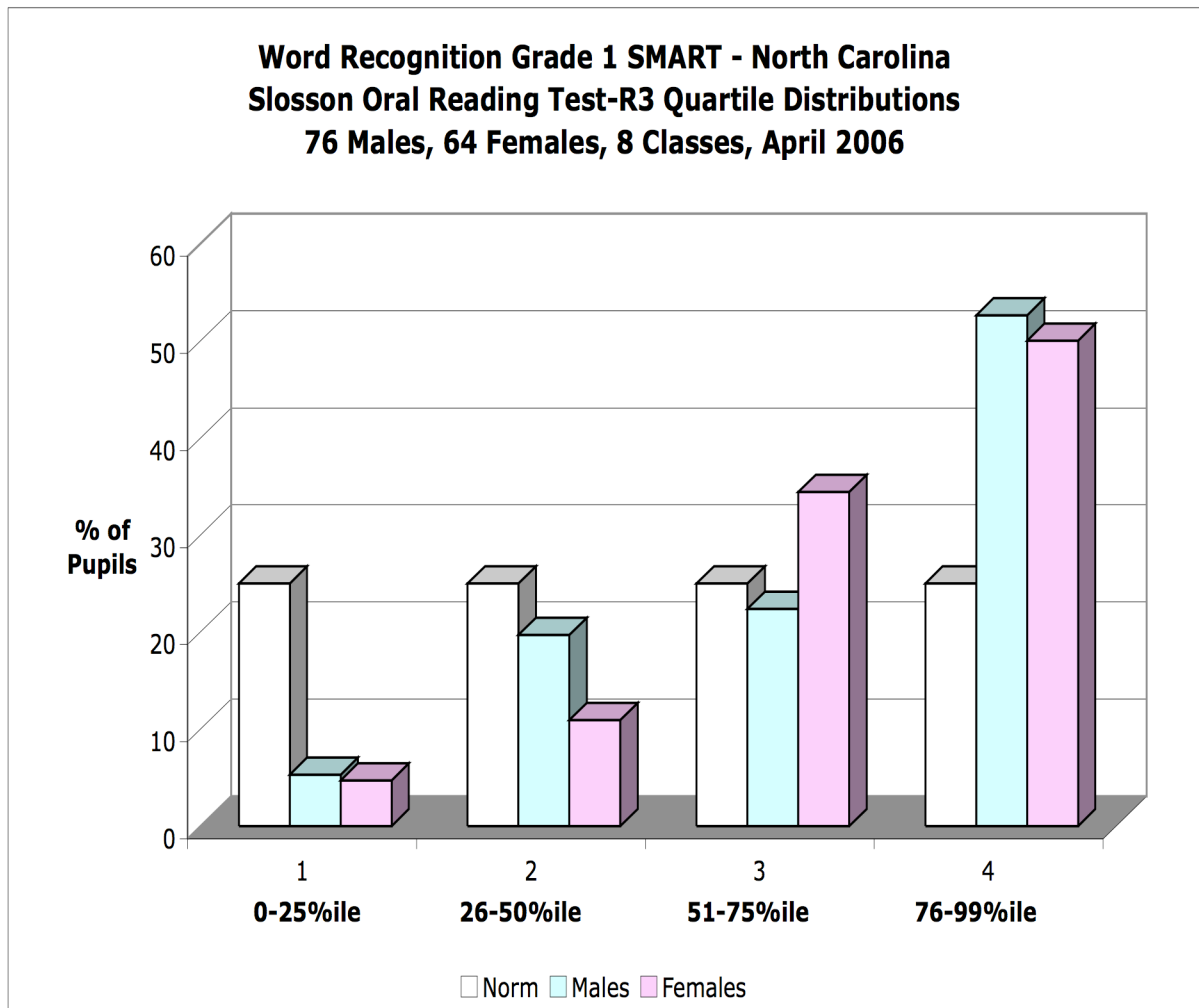


First-Grade

Quartile distributions of regular males and females on quick word recognition of words in isolation on the nationally-standardized SORT-R3 is shown in Graph 4 (2 males and 3 males with special needs excluded). Proportions of 25% are expected for each bar according to norms (white bars). The distribution in Graph 4 reveals that 80% of females and 73% of males scored above the national mean (bars 3 and 4 combined). The normal curve comparison with collapsed stanines for males was shown earlier in Graph 1. Fewer than 5% of regular students scored in the lowest quartile.

More than 90% of males and female minority and low-income students scored a average or high levels of reading.

Graph 4

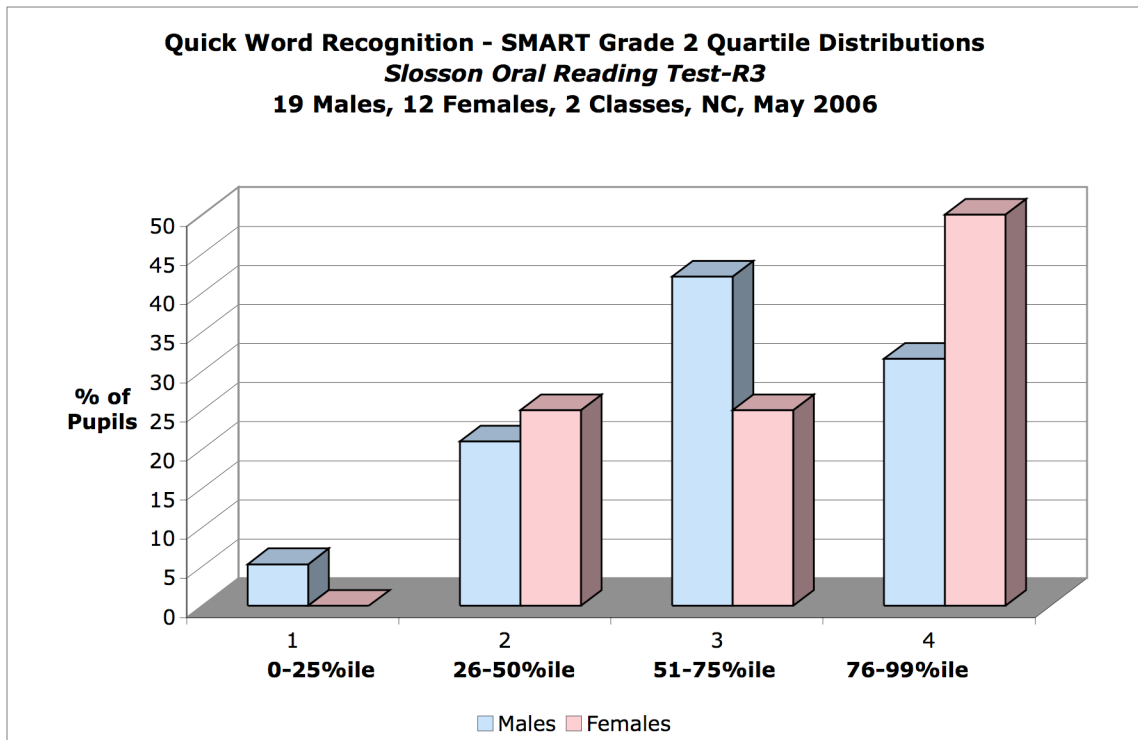


Second Grade

Quartile distributions of regular males (N=19) and females (N=12) on quick word recognition of words in isolation on the nationally-standardized SORT-R3 is shown in Graph 5. Proportions of 25% are expected for each bar according to norms (white bars). The distribution in Graph 5 reveals that 95% of males and 100% of females scored at or above the normal range (above the 25<sup>th</sup>ile; and 74% of males and 75% of females scored above the national mean (bars 3 and 4 combined). Although 50% of females scored in the top quartile, 32% of males scored at that level. Fewer than 5% of males scored in the lowest quartile.

Median scores for males and females were at the 62<sup>nd</sup> and 75<sup>th</sup> percentile of national norms respectively. Several of the males had not received SMART programming in kindergarten or first grade, and those in the middle quartiles will improve with SMART in third grade. A similar pattern of mastery and achievement above the national mean for females and males more similar to the norm distribution was found in the only third-grade SMART class of 7 males and 5 females (only one male in lowest quartile).

**Graph 5**

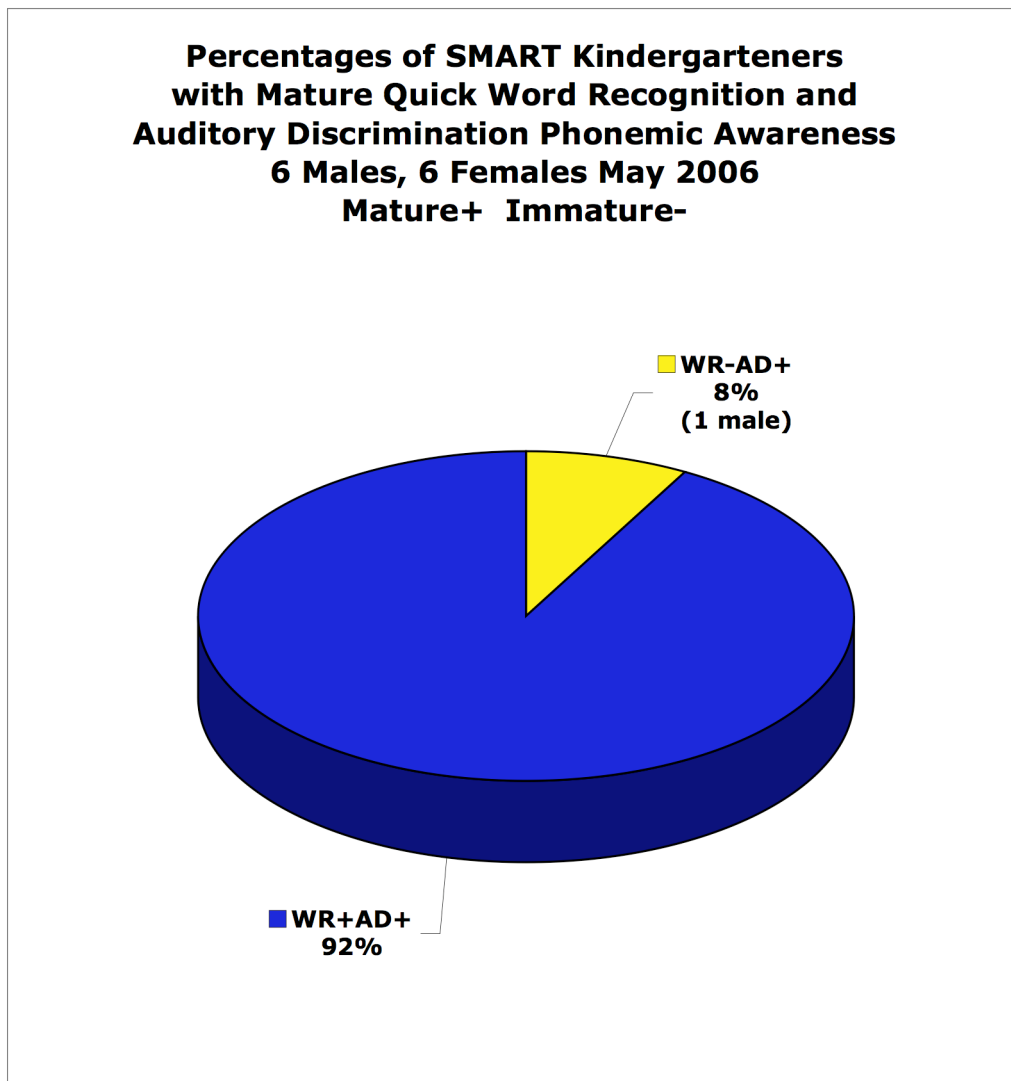


K-1 Phonemic Awareness compared to Word Recognition

The foundation for phonemic awareness is measured using **Wepman's Auditory Discrimination Test** (WADT) and the SMART procedures for stimulation in phonetic listening skills are especially effective. For example, in this one class testing both word recognition and auditory discrimination, 100% of pupils scored at normal or higher levels (85<sup>th</sup>ile median) and 75% scored in the highest quartile.

Correlated proportions of students mature in both phonemic awareness and quick word recognition provide are shown in Graph 6 in which only one male is below the 25<sup>th</sup>ile in word recognition but is mature in auditory discrimination. The entire class is ready for first-grade reading curriculum, and the one student is ready for a phonetic approach to first-grade reading curriculum.

Graph 6

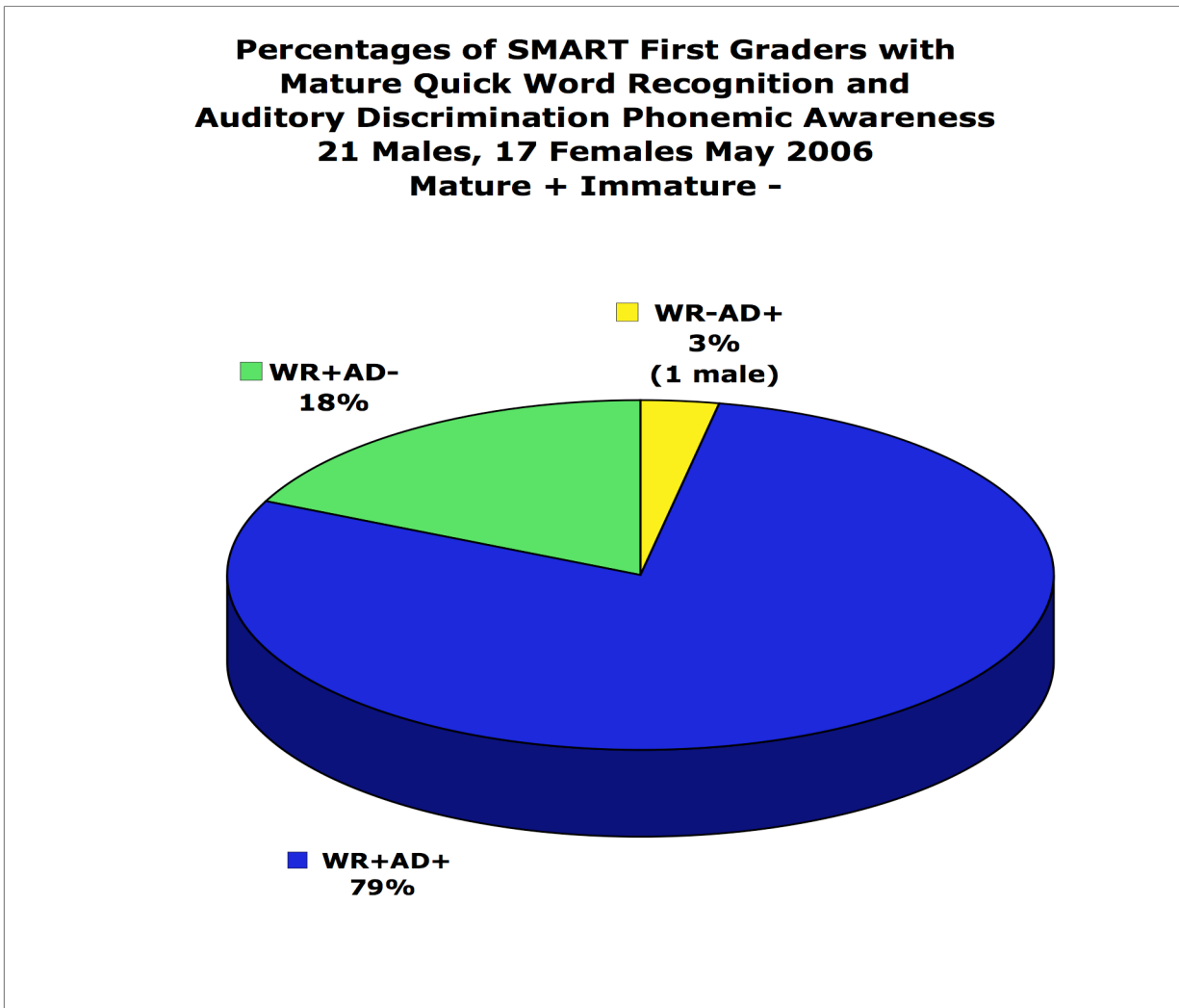


First-grade SMART correlated proportions for two classes is shown in Table 7 reveal that all but one of 38 students scored weak in word recognition but mature in

auditory discrimination and phonetic analysis for a phonetic reading approach. Almost 1/5 (18%) of the students exhibit good sight recognition of words but faulty auditory discrimination, indicating a need for more SMART phonemic awareness stimulation while continuing an automatic sight-word recognition and fluency curriculum agenda.

Overall, the class medians for auditory discrimination were the 87<sup>th</sup> %ile for both males and females; 100% of males and 98% of females scored normal or higher, 86% of males and 82% of females scored above the national mean, and more than 60% scored in the highest quartile. These students will be flexible in automatic word recognition and phonemic analysis. They are ready to continue success and enjoyment in reading.

Graph 7



Conclusions

Teachers fully-implementing the SMART program produced high levels and proportions of proficiency with regular K-3 students in North Carolina, with April/May median of class medians of about 2/3 of a standard deviation higher than fall assessment indicated. In automatic quick word recognition and phonemic awareness auditory discrimination maturity, all but a few regular students were achieving at normal or higher levels of proficiency by the end of the school year. The high levels of performance as shown in quartile distributions compared to national norms are striking in the shift to the highest quartile (above the 75<sup>th</sup> percentile). These teachers championed the systematic daily stimulation for readiness and early literacy, demonstrating unusual and impressive results usually obtained by only a few master teachers.

The SMART class results reported here represent what can be accomplished with high fidelity programming and mentoring by experienced staff from the Minnesota Learning Resource Center. When fully implemented with consistency on a daily basis, with staff working as grade-level teams meeting regularly with strong administrative leadership, the SMART program is a powerful tool for teachers dedicated to early literacy excellence.

This report demonstrates that students at-risk for school difficulties can achieve early literacy proficiencies at exemplary levels as foundation for mastery of primary skills at quick and automatic response levels. The at-risk males, in particular, can outperform the regular males and females. The key to the success of SMART is the consistent input and direction by the classroom teachers, including the warm climate of joy and playfulness.

Some students may need more than one year of SMART, including the possibilities of SMART Pre-K, summer SMART, After-school SMART, and successive years of SMART in the primary grades. Appropriate fidelity and intensity of the complete program is essential in assuring long-term installation of the program and consistent annual readiness and early literacy. More than one year of work with the program may be necessary for some teachers to fully integrate and internalize the principles, techniques, neuro-developmental understanding and related regular curricula.

The results of bringing students with at-risk characteristics to these high levels of proficiency is inspiring and we wish to recognize the high calling of staff who dedicate themselves to learning and using these pedagogical tools to provide the foundation for later school success. We congratulate the staff involved in creating these excellent results. These teachers are champions in every respect.

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August 5, 2007

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Winslow Homer "Snap the Whip" 1873 (Metropolitan Museum)