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A Comparison of Reading Mastery Fast Cycle *and* Horizons Fast Track A–B *on the Reading Achievement of Students With Mild Disabilities*

Abstract: This study examined the reading gains of students with mild disabilities who were taught with one of two programs: *Horizons Fast Track A–B* (Engelmann, Engelmann, & Seitz-Davis, 1997) or *Reading Mastery Fast Cycle* (Engelmann & Bruner, 1995). A quasi-experimental design with preexisting groups was used to examine changes from pretest to posttest. Results revealed a pattern of small differences favoring *Reading Mastery Fast Cycle* on measures of decoding; however, these differences were not statistically significant. Both programs were effective in producing statistically significant improvements in word attack, comprehension, letter and word identification, phonemic awareness, and print awareness skills. Participating teachers agreed that both programs were effective; however, anecdotal information from teacher interviews suggested that all participating teachers preferred *Horizons Fast Track*.

Direct Instruction (DI) reading programs have been researched for over 25 years (Adams & Engelmann, 1996). Project Follow Through, probably the largest federally funded educational study conducted in the United States, compared instructional models for improving the academic performance of disadvantaged students in kindergarten through third grade. The DI model was compared with eight other models, and results indicated that students who were instructed with the *Direct Instruction System for Teaching Arithmetic and Reading* (*DISTAR*) achieved and maintained higher scores in basic skills, affective skills, and cognitive skills than students instructed with any of the other models (Stebbins, St. Pierre, Proper, Anderson, & Cerva, 1977). The reading component of *DISTAR* was an early version of the current *Reading Mastery* programs (Engelmann & Bruner, 1995), which follow the same careful program design evident across all DI programs.

Watkins and Slocum (2003) described five elements of DI program design: (a) analyzing content matter and identifying ideas and generalizable strategies that enable students to learn more in less time, (b) designing clear communication to minimize uncertainty for students, (c) designing instructional formats to structure dialogue between teachers and students, (d) sequencing skills to maximize student success and minimize confusion, and (e) organizing instructional topics and objectives into tracks to allow for systematic skill development across the program and to support cumulative review and application. These critical design elements are evident in *Reading Mastery*, and this program has been shown to

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be particularly effective for low performing beginning readers, including students with disabilities (Adams & Engelmann, 1996).

Consensus reports have established the critical components of beginning reading instruction (Adams, 1990; National Institute of Child Health and Human Development, 1996; National Reading Panel, 2000; Snow, Burns, & Griffin, 1998). Recent reviews conducted by the Oregon Reading First Center (http://oregonreadingfirst.uoregon.edu/SIreport.php#newprograms) and Schieffer, Marchand-Martella, Martella, Simonsen, and Waldron-Soler (2002) have found that *Reading Mastery* includes these components. *Reading Mastery* programs implement the critical components of beginning reading instruction by teaching phonemic awareness explicitly; providing systematically sequenced phonics instruction; teaching synthetic phonics, where letters are converted into phonemes and then blended to form whole words; using guided oral reading with appropriate error correction techniques and feedback strategies to facilitate reading fluency; and developing vocabulary and using systematic instruction to promote reading comprehension.

Reading Mastery not only includes the essential components of a strong beginning reading program, but it teaches these components effectively. Adams and Engelmann (1996) conducted a meta-analysis of research on *Reading Mastery* and other Direct Instruction programs. Findings indicated that *Reading Mastery* and Direct Instruction programs were successful for a range of teachers and students (e.g., general and special education, elementary and secondary levels). In addition, the effects of recent adoptions have been reported by McGraw-Hill, the National Association of Elementary School Principals, and the American Federation of Teachers (2002). Case studies of eight schools across the country that adopted and implemented *Reading Mastery* reported improvements in performance and reading achievement levels that exceeded peers in comparable schools.

Despite strong empirical support for *Reading Mastery*, Engelmann (2000) and Grossen (n.d.) have identified criticisms of *Reading Mastery* from practitioners. Some of these criticisms include the use of unconventional orthography, delayed introduction of letter names and capital letters, and difficult presentation skills (i.e., blending sounds without pausing, presenting exercises from a teacher-held presentation book). In response to these and other criticisms, Engelmann and colleagues created an alternative reading program titled *Horizons* (Engelmann, Engelmann, & Seitz-Davis, 1997). *Horizons* shares many important design features with *Reading Mastery*. Both *Reading Mastery* and *Horizons* (a) provide sufficient lessons to span a school year; (b) provide teachers with scripted presentations; (c) initially introduce skills in isolation; (d) operate using a "two-lesson rule" (i.e., a specific item will occur on at least two consecutive lessons before students are assumed to have learned it); (e) use a track design, rather than lessons designed to focus primarily on one objective; (f) provide structured teaching for skills; (g) follow the same sequencing rules for what students read; (h) produce a high rate of student responses; (i) include structured and independent work parts; (j) include oral reading on structured sections of lessons; (k) provide prompts; (l) follow design rules for student responses; (m) incorporate strategies for irregular words; (n) introduce a few letters before students read words; (o) teach more words compared to traditional programs; (p) are phonics-based programs; and (q) were field-tested before being published (Engelmann, 2000).

In a summary of the differences between *Reading Mastery* and *Horizons*, Engelmann (2000) emphasized the following points. The two programs differ in the "sequence, procedures, prompts, orthographic conventions, and in teacher-presentation conventions" (p. 19).

Sounds and strategies for blending sounds are taught differently. *Reading Mastery* teaches letter sounds before letter names, whereas *Horizons* requires students to use letter names as assistance in learning letter sounds. *Reading Mastery* does not use capital letters early in the program; *Horizons* includes the use of capital letters on the first lessons that present sentences (after lesson 90), and *Horizons* uses letter names to prompt letter sounds.

In both programs students are able to decode a variety of word types (e.g., closed and open syllable words) at an early point in the program without recourse to rules. This allows for the use of a larger initial vocabulary and hence more interesting stories than would be possible if the stories were limited to words with closed syllables. In both programs visual prompts are embedded in the text to cue the students when to say sounds different from the common sounds and to read letter combinations. Engelmann (2000) noted that the primary objective of *Reading Mastery* (Level I) is to "regularize the reading code so that children are able to apply the smallest set of rules to read the maximum number of words" (p. 16). However, a significant difference between *Horizons* and *Reading Mastery* is the type of visual prompt used to help students decode words. *Reading Mastery* relies on special orthographic features (i.e., letter forms) to prompt correct sounds for confusing letters (e.g., b and d), letter combinations (e.g., sh, th), or silent letters (i.e., shown with smaller type); in contrast, *Horizons* uses conventional print with changes in color and the use of underlining to cue students to give the correct sound. In *Reading Mastery*, the form of the letter signals specific sounds, whereas in *Horizons* the color of the letter and the use of underlining signal where a different pronunciation is required. For example, blue letters are used to cue students that a letter "says its name," letter combinations (e.g., sh, th, oa) are underlined to indicate that two letters make only one sound, and a squiggle underline is used to indicate an "irregular" pronunciation of the underlined part of the word (e.g., said). Furthermore, the teacher presentation materials have been simplified. *Reading Mastery* is designed for students to respond to instructional tasks that are displayed in a teacher presentation book. In contrast, *Horizons* presents instructional tasks in the form of student readers. Finally, *Reading Mastery* has over 25 years of research to support its effectiveness, whereas we have located only one study (Tobin, 2003) reporting effects of the recently published *Horizons*.

Given these differences, research is needed to evaluate the effectiveness of these program changes. The purpose of this study was to determine if there are differences in the reading gains of students with mild disabilities who are taught with *Horizons Fast Track A–B* and those taught with *Reading Mastery Fast Cycle*. In addition, this study used interview questions to gain information on teacher perceptions of the two reading programs. Specifically, our research questions were

1. Are there differences in the reading gains of students with mild disabilities who receive reading instruction in *Horizons Fast Track A–B* when compared to students with mild disabilities who receive reading instruction in *Reading Mastery Fast Cycle*?

2. After teaching with both *Horizons Fast Track A–B* and *Reading Mastery Fast Cycle* would teachers have a preference for one program over the other for instruction of students with mild disabilities?

Method

Participants

A total of 30 students and 3 teachers in three elementary schools participated in this study. Data were collected in Schools A and B during the 1st year of the study. However, School B was unable to participate in the 2nd year of the study due to teacher reassign-

ments; thus, School C was substituted with a different teacher.

All student participants were identified as having mild disabilities and were eligible for specialized reading instruction from a special education teacher in a resource room setting. Students ranged in grade level from second to fourth grade, and all could identify letters by name, a prerequisite skill for *Horizons*. Due to existing school schedules already in place, we were not able to randomly assign students to groups; instead, we randomly assigned the two groups at each school to either *Reading Mastery Fast Cycle* (*RMFC*) or *Horizons Fast Track A–B* (*HFT*).

As shown in Table 1, participants included 16 second graders, 13 third graders, and 1 fourth grader. Of the 30 participants, 23 were male. A range of disabilities was represented in the groups; however, our lack of control over student assignment resulted in unequal distribution of students with various disabilities. Half (15) of the students had a learning disability and 10 of these were in *RMFC* groups. All 6 students identified with mild mental disabilities (EMD) were in *HFT* groups. Four of the 5 students identified with behavioral–emotional disabilities were in *RMFC* groups. Four participants were identified as other health impaired (e.g., severe attention deficit disorder) with 1 in *RMFC* and 3 in *HFT*.

Setting

The three elementary schools were located in a large, suburban school district in the Southeastern United States serving students primarily from middle-income families. The three schools were within approximately 15 miles of each other. Reading instruction for both treatments was conducted in special education resource rooms. Participants were taught lessons in either *RMFC* or *HFT* in groups of three to five. During daily instruction, the participants sat at half-circle tables in the resource room with the instructor on the inside and participants on the outside.

Table 1

Demographics of Participants

		Age	Gender		Ethnicity			Disability			
	n		M	F	White	African American	Hispanic	BED	EMD	LD	OHI
RMFC											
Year 1	6	8.0	4	2	5	1	0	1	0	5	0
Year 2	9	8.3	8	1	7	1	0	3	0	5	1
HFT											
Year 1	8	8.0	7	1	5	2	1	0	2	4	2
Year 2	7	8.2	4	3	4	3	0	1	4	1	1

Note. BED = Behaviorally/Emotionally Disabled; EMD = Educable Mentally Disabled; LD = Learning Disabled; OHI = Other Health Impaired.

Teachers and Data Collectors

A single special education teacher at each school provided the small group instruction for both treatment conditions. The special education teachers at Schools A, B, and C had 21, 8, and 3 years of teaching experience, respectively. Two of the teachers held B.A. degrees in special education and one of the teachers was working on a master's degree in special education during the study. An undergraduate student in special education administered the pretest and posttest assessments for Year 1 and a doctoral student in special education administered pretests and posttests for Year 2. The doctoral student also conducted fidelity checks for both years of the study.

Measures

For pretest and posttest measures, participants were assessed at the beginning and end of the school year using the Woodcock–Johnson Psychoeducational Battery—Revised (WJ—R; Woodcock & Johnson, 1989) and the North Carolina Literacy Assessment, a state developed test used to assess students in kindergarten through second grade.

Woodcock–Johnson Psychoeducational Battery—Revised. The WJ—R Letter–Word Identification, Word Attack, and Passage Comprehension subtests were administered. Letter–Word Identification and Passage Comprehension subtests were used to derive a Broad Reading Score, and the Letter–Word Identification and Word Attack subtests provided a Basic Reading Score.

The Letter–Word Subtest of the WJ—R measures the ability of students to give letter names and read words of increasing difficulty. The Word Attack subtest measures the ability to read phonetically regular nonsense words (e.g., iv, sug). The Passage Comprehension subtest measures the ability to read text and supply a word that fills in a blank. Form A of the WJ—R was used for pretest and Form B was used for posttest assessments to control for test–retest effects.

State assessment. The North Carolina Literacy Assessment for kindergarten through second grade has 12 sections. Section 1 measures book and print awareness (e.g., students are asked to identify the front and back of a book, point to the title of the book, and identify the first word on a page in a book). Phonic analysis is measured in Section 2, requiring students to identify initial consonant sounds, consonant digraphs, and consonant blends. Sections 3–7 measure specific components of phonemic awareness including: (a) identifying rhyming words, (b) naming words that start with the same consonant, (c) stating the number of sounds in a word, (d) identifying words when the phonemes are separated, (e) naming words using onsets and rimes (e.g., c...an, f...an), (f) identifying beginning sounds and letter names after the administrator says a word, and (g) identifying rhyming words in a nursery rhyme. Section 8 screens for phonemic awareness. The teacher reads a nursery rhyme to students then reads two words from the nursery rhyme and asks if the words rhyme (e.g., "Does *store* rhyme with *more*?"). Section 9 requires students to listen to a word from the same nursery rhyme and state the beginning sound of the word. In Section 10, the teacher says words from the nursery rhyme and students state the number of sounds they heard in the word. In Section 11, students are asked to identify words that start with the same sounds as spoken words. Section 12 measures student awareness of letter–sound relationships. For example, the teacher says a word, the student identifies the sound at the beginning of the word and names the letter the sound represents.

Interview. All 3 participating special education teachers were interviewed at the end of Year 2 of the study. The 10-min interviews were conducted individually at each teacher's school. Participants were verbally asked one question

at a time and their spoken responses were recorded by the data collector.

Programs

The two reading programs used for instructional purposes in the present study were *Reading Mastery Fast Cycle* (*RMFC*) and *Horizons Fast Track A–B* (*HFT*). *RMFC* is a combination of *Reading Mastery I* and *Reading Mastery II*. *Reading Mastery I* and *Reading Mastery II* have 160 daily lessons each, whereas *RMFC* combines both programs in 170 lessons. In like manner, *HFT* is a 150-lesson combination of *Horizons Level A* (155 lessons) and *Horizons Level B* (150 lessons). *RMFC* and *HFT* are both designed to teach reading to students in Grades K–3 and address the following: (a) phonemic awareness, (b) explicit phonics, (c) controlled letter–sound introduction, (d) blending, (e) decodable text, (f) accuracy and fluency building, (g) integrated spelling instruction, and (h) use of scripted teacher presentations.

Design

This study used a quasi-experimental design with preexisting groups. Six two-way repeated measures analyses of variance (ANOVAs) were used to examine the changes from pretest to posttest and differences between groups. One ANOVA was performed for each dependent variable: (a) Letter–Word Identification subtest of the WJ—R, (b) Passage Comprehension subtest of the WJ—R, (c) Word Attack subtest of the WJ—R, (d) Broad Reading Score of the WJ—R, (e) Basic Reading Score of the WJ—R, and (f) the score on the North Carolina Literacy Assessment. There were two independent variables. The repeated independent variable was time (pretest or posttest), and the between-subjects independent variable was the reading curriculum (*RMFC* or *HFT*).

Procedures

Training. Both teachers who participated in the study for the 1st year had been previously trained by an SRA/McGraw-Hill consultant to implement *Reading Mastery I, II,* and *Fast Cycle* and both had 4 years experience teaching *Reading Mastery*. Prior to the beginning of the school year, the teachers were trained to implement *HFT* by an SRA/McGraw-Hill consultant.

During Year 2 of the study, one of the teachers from Year 1 was reassigned by the district, and another special education teacher in the same school district agreed to participate in the study. The new teacher had been previously trained to teach *Reading Mastery* and had experience implementing the program in a special education resource room setting for less than 1 year in another school district. Because she was less experienced than the other two teachers and had not been involved in the study during the 1st year, she was trained to implement *HFT* in a one-to-one setting by the same SRA/McGraw-Hill consultant who trained the other teachers. In addition, the new teacher had a doctoral student model *HFT* lessons with her students for 5 days and serve as her coach for the first few lessons as she began teaching *HFT.*

Instruction. The special education resource teacher at each school provided the instruction for both treatment groups. During the reading instruction, the teachers did not have responsibility for managing other students in the resource setting. All groups received reading instruction in the morning, and each group consisted of 3–5 students. Typically, teachers provided instruction daily for both treatment groups; however, due to irregularly scheduled events (e.g., special school programs, field trips, etc.), reading instruction sometimes occurred less than 5 days per week. Spelling instruction was included in the daily *HFT* lessons. To provide comparable instruction for the *RMFC* group, the *Reading Mastery* spelling program was added as part of the instructional time.

The *HFT* and *RMFC* instruction typically required 30–40 min for each lesson. When participants did not master the skills in a lesson, that lesson was repeated on the following day.

The teachers followed the program's scripted text including the use of scripted correction procedures when students made errors.

During Year 1 of the study, *RMFC* participants at School A and School B completed 166 and 160 of the 170 program lessons, respectively. The *HFT* participants at both School A and School B completed 121 of the 150 lessons in the program.

During Year 2 of the study, *RMFC* participants at School A and School B completed 130 and 160 of the 170 program lessons, respectively. The *HFT* participants at School A and School C completed 114 and 110 of the 150 program lessons, respectively. See Table 2 for lessons taught in each program and the percentage of the program completed.

Procedural Reliability

Procedural reliability data were collected for 20% of the instructional sessions by a trained observer using procedural checklists developed for each instructional program. The first or third author used a random schedule to phone the teachers and request that they audiotape their lessons that day. The audiotapes were collected and then scored while the observer listened to a tape and followed the written lesson in the respective program manual. A "+" was recorded for an item on the procedural checklist if the teacher accurately presented the task. A "–" was recorded if the task was omitted or not presented accurately. "Not applicable" was recorded for checklist items that were not included in the scripted lesson.

For *HFT* a 12-item procedural checklist was used to measure the integrity of the teacher's

Table 2

Beginning/Ending Lessons, Lesson Completion, and Fidelity of Treatments

	Beginning and ending lessons		% of program at completion		Procedural reliability	
	RMFC	*HFT*	*RMFC*[1]	*HFT*[2]	*RMFC*	*HFT*
Year 1						
School A	50–166	20–121	98%	81%	100%	98%
School B	1–160	1–121	94%	81%	95%	100%
Year 2						
School A	50–130	20–114	76%	76%	100%	100%
School C	1–160	1–110	94%	73%	100%	100%

[1] *Reading Mastery Fast Cycle*.

[2] *Horizons Learning to Read Fast Track A–B*.

presentation. The observer recorded whether the teachers (a) introduced new sounds followed by an opportunity for students to say the sounds; (b) required students to sound out words, spell words verbally, and then to read the words at a normal rate following an introduction of new words; (c) required students to read the sections of the story individually or to read the entire story as a group; (d) asked questions about the story following the reading; (e) instructed students in the completion of the workbook activities; and (f) included letter–sound introductions, word introductions, practice, and writing sentences and/or words during the spelling activities.

An 8-item procedural checklist was used to measure the integrity of the delivery of *RMFC*. The observer recorded whether the teachers (a) introduced letter sounds and decoding skills during the prereading exercises; (b) required students to decode lists of words aloud, in unison and individually; (c) explained the skill exercises in the students' texts; (d) required students to take turns reading aloud from textbooks; (e) presented comprehension questions following the reading of materials; (f) measured each student's decoding rate and accuracy; (g) checked the students' independent work; and (h) conducted spelling activities from the supplementary *Reading Mastery* spelling program.

Table 2 shows that there was high reliability across teachers and across programs with the mean reliability for across teachers and programs ranging from 95% to 100%. There were few occasions when teachers failed to include or correctly implement an exercise. In addition, the observer noted that lesson scripts and correction procedures were followed by all teachers.

Results

Results for the WJ—R subtests are reported using a norm-based standard score, where the population mean is 100 and the standard deviation is 15. Thus, the scores reflect students' standing compared to other students in their grades. If students progressed at an average rate across the course of the study, they would show no change in these scores. The State K–2 Literacy Assessment results are raw scores, which represent the number correct out of 54 possible points. The means, standard deviations, and effect sizes for the pretests and posttests by reading programs are reported in Table 3. Both reading program groups increased from the pretests to posttests for all measures. On the WJ—R measures, effect sizes ranged from .09 to .36, and on the State K–2 Literacy Assessment, effect sizes fell between .71 and .78. Comparing the two programs, components of the WJ—R related to decoding (i.e., Word Attack and Basic Reading) show differences in effect sizes favoring *Reading Mastery* while components related to comprehension (i.e., Comprehension and Broad Reading) show essentially no difference between programs. The State Literacy Assessment also showed comparable gains in the two programs.

The results of the repeated measures ANOVAs are reported in Table 4. There were statistically significant gains (i.e., pre/post within-subjects effects) for all the dependent variables. This suggests that the means across both treatment groups improved from pretests to posttests. There were no statistically significant between-subjects factor effects for any of the dependent variables. There were no statistically significant interactions on any of the measures, which is particularly important because it indicates that differences between the groups in the amount of growth from pretest to posttest was not beyond that which would be expected as the result of chance.

Interview Responses

Question 1: Do you notice any differences between the programs regarding level of instructional difficulty? One teacher responded that *Horizons* is easier to implement due to the integration of the

reading and spelling components while another teacher stated that *Reading Mastery* is less difficult initially because students are not required to know letter names prior to entry into the program. The third teacher answered by stating that the instructional difficulty of programs is similar.

Question 2: Is one program more appealing to you? All three participating teachers commented that they prefer *Horizons.* One teacher stated that *Horizons* is more interesting and fun to teach while the other two stated that they prefer it because the inclusion of the spelling component was more integrated with the reading skills.

Question 3: Describe the student reactions to the reading programs. Are students assessing their own reading skills? If so, what do they say? All three teachers stated that students were making comments regarding a boost in reading enjoyment due to the newly acquired skills. Two of the teachers stated that students appeared aware of their improvements and were finding reading to be an easier task than prior to receiving instruction in either program. Of those two teachers, one remarked that her students were frequently making statements about their success such as, "Yeah, we can read now!"

Question 4: Does one program allow students to read materials outside of the program (e.g., trade books, texts on reading level) more successfully? All three teachers stated that the programs were comparable in preparing students to read materials outside of the program. One teacher prefaced her response by stating that there were still differences between the reading abilities of students but that the programs were equal in allowing students to acquire basic skills.

Question 5: Is one program stronger in teaching comprehension skills? One teacher stated that neither program is stronger than the other but

Table 3

Means and Standard Deviations on the Pretests and Posttests by Program

	Reading Mastery (N = 15)					*Horizons* (N = 15)				
	Pretest		Posttest			Pretest		Posttest		
Measures	*M*	*SD*	*M*	*SD*	*ES*[1]	*M*	*SD*	*M*	*SD*	*ES*[1]
Letter–Word ID	79.69	19.87	83.63	18.36	.20	78.36	16.86	80.00	14.82	.10
Comprehension	81.38	16.60	87.31	21.96	.36	79.36	19.59	85.57	18.27	.32
Word Attack	82.50	15.39	86.31	13.49	.25	81.36	15.48	82.64	15.71	.08
Broad Reading	78.94	19.76	83.94	21.76	.25	77.07	18.91	81.00	16.96	.21
Basic Reading	80.13	17.18	84.25	16.94	.24	79.14	16.03	80.57	14.78	.09
State Literacy	34.06	12.02	42.56	8.28	.71	31.50	12.70	41.43	9.83	.78

[1]Effect size is computed as $ES = m_{post} - m_{pre} / s_{pre}$

Table 4

Results of Repeated Measures ANOVAs

Dependent Variable	Factor		*df*	*MS*	*F-ratio*	*p*
Letter Word Identification	Within Ss	Pre/Post	1	116.26	6.22	0.02
		Interaction	1	19.66	1.05	0.31
		Error	28	18.68		
	Between Ss	Program	1	91.67	0.15	0.70
		Error	28	607.26		
Comprehension	Within Ss	Pre/Post	1	551.29	18.00	0.00
		Interaction	1	0.29	0.01	0.92
		Error	28	30.63		
	Between Ss	Program	1	52.75	0.07	0.79
		Error	28	708.36		
Word Attack	Within Ss	Pre/Post	1	97.04	4.24	0.05
		Interaction	1	23.84	1.04	0.32
		Error	28	22.88		
	Between Ss	Program	1	86.46	0.20	0.66
		Error	28	427.33		
Broad Reading	Within Ss	Pre/Post	1	297.62	14.11	0.00
		Interaction	1	4.29	0.20	0.66
		Error	28	21.09		
	Between Ss	Program	1	86.14	0.12	0.74
		Error	28	741.30		
Basic Reading	Within Ss	Pre/Post	1	115.14	9.87	0.00
		Interaction	1	27.14	2.33	0.14
		Error	28	11.66		
	Between Ss	Program	1	81.10	0.16	0.70
		Error	28	520.90		
NC Literacy	Within Ss	Pre/Post	1	1267.89	76.43	0.00
		Interaction	1	7.62	0.46	0.50
		Error	28	16.59		
	Between Ss	Program	1	51.01	0.23	0.63
		Error	28	217.26		

that there are more opportunities for students to practice comprehension skills in *Reading Mastery*. The other two teachers commented that *Horizons* is stronger in teaching comprehension skills because of the inferential and higher-level questions incorporated throughout the program.

Question 6: In talking to the regular education teachers, do they see considerable improvement in decoding skills with one or both of the programs? All three commented that regular education teachers were able to see considerable improvements in decoding skills with both programs. In fact, one teacher said that she was approached by regular education teachers who were seeking advice on providing more assistance to students with reading difficulties. One of the participating teachers stated that regular education teachers saw more of a difference for students who received instruction in *Horizons* because students were able to generalize more skills to assignments in the regular classroom due to the integrated spelling component.

Discussion

Results of this study indicate significant differences from pretest to posttest for all dependent variables. That is, students who received instruction in either Direct Instruction program (i.e., *Horizons* or *Reading Mastery*) made significant gains on reading subtest scores of the WJ—R, reading cluster scores of the WJ—R, and on the combined score of the State Literacy Assessment from pretest to posttest. The gains on the components of the WJ—R indicate that students in both programs learned at a rate higher than that of the test's norm group. The gains on the State Literacy Assessment indicate that students improved their knowledge of print awareness and phonological awareness. An examination of effect sizes (see Table 3) revealed a pattern of small differences favoring *Reading Mastery* over *Horizons* on measures of decoding; however, these differences were not statistically significant. On measures of phonological awareness (State Literacy Assessment) and comprehension, the two programs produced comparable results.

Anecdotal information from the interviews suggests that all participating teachers preferred *Horizons*. Nevertheless, all participating teachers stated that both programs were equivalent in allowing students to transfer acquired skills to read materials outside of the respective program. Moreover, all three participating teachers affirmed that general education teachers were able to see considerable improvements in decoding skills with both programs and that the students became aware of their own progress, stating that reading was becoming an easier task.

We found these responses surprising given the teachers' previous commitment to *Reading Mastery*. At the *Horizons* training session, the two more experienced *Reading Mastery* teachers from Schools A and B voiced some skepticism that *Horizons* would be as effective with their students with special needs and noted several specific concerns. First, they attributed their successful experiences in teaching beginning decoding with *Reading Mastery* to the specific orthographic prompts for producing correct sounds, unlike *Horizons* with its more general color cues. Both felt that requiring students to learn letter sounds through letter name prompts would be confusing to some students, noting that simply showing the letters and providing the sound was more direct. Both felt these changes would result in particular difficulty for students identified as having mild intellectual disabilities (a category labeled as "educable mentally disabled" in their state). Perhaps of greatest concern was the strategy of pausing between letter sounds as practiced in *Horizons*. Both teachers anticipated that the pausing would reduce accurate blending and phonological recoding. They also expressed concern that they would mix the strategies as they taught both programs; however, in prac-

tice, none of the three teachers were heard to mix strategies during the audiotaped sessions.

Interestingly, the characteristics these teachers valued in *Reading Mastery* were some of the very criticisms Engelmann (2000) responded to in the design of *Horizons* (i.e., orthographic prompts, sounding out words without pausing, letter sounds without reference to letter names). While the teachers in this study attributed effectiveness of *Reading Mastery* to these features, Engelmann suggested that a number of instructional problems can be solved in more than one way and it is the "systematic, small-step progressions" (p. 26) that allow both programs to be successful. It may be that devotees of *Reading Mastery*, due to their fluency and familiarity with some of the most distinctive features of that program, are less receptive to *Horizons* than those who do not have experience with *Reading Mastery*.

However, after the 1st month or 2 of instruction, the teachers independently mentioned that their *HFT* group was making regular progress through the lessons, and the students seemed very excited about their ability to read books. As the year progressed, the teachers increasingly made positive comments about *Horizons*. As the interview responses note, by the end of the study all of the teachers felt both programs were equally effective, but preferred *Horizons*. All of the students identified as having mild intellectual disabilities were in groups assigned to *Horizons*. Since this group was of particular concern to the teachers, the equivalent increases in reading achievement between programs suggests their initial concern was not realized.

Limitations

There are a number of limitations to the present study. While we were able to ensure that each teacher taught one group of *HFT* and one of *RMFC* to help control for teacher characteristics (e.g., number of years of teaching, experience with *Reading Mastery*), students were not randomly assigned to the treatments. Due to scheduling constraints we assigned treatments to intact groups. Thus, biases in the schools' assignment of students to groups could have influenced the results. In addition, students in the *RMFC* group had slightly higher WJ—R pretest scores when compared to the *HFT* group. These differences may have contributed to the slightly higher decoding scores of students in *RMFC*. Another limitation was uneven distribution of disabilities between the programs. This may have influenced the results due to differences in student aptitude. That is, students identified with different disabilities may differ in the ease with which they learn to read. Further, results could be influenced by aptitude–treatment interactions by disability and program. That is, students might respond more favorably to features of one program over the other due to specific characteristics of their disabilities. Without matching students to programs by disability, it is unclear what influence the disabilities of the students may have had on the present outcomes. Thus, comparisons between programs in this study should be made with caution and viewed as preliminary indications rather than as definitive.

Additionally, although the teachers attempted to keep the number of sessions they held with each group the same, and repetition of lessons was minimal in both programs, there were school schedule variables that resulted in differences in the amount of instruction over time. As Table 2 illustrates, teachers covered a greater percentage of the *RMFC* program.

Additional research with more participants is needed to strengthen these findings. We were able to aggregate findings from 30 students over 2 years. Additional studies that increase the number of participants would increase our power to detect differences that may exist between the programs. In addition, replications could reduce possible confounding variables by using random assignment of students to condition. Even if intact groups are used,

more studies need to be conducted to determine the generality of these findings. These replications might include younger students or students who are not identified as having a disability. The comparison was made with the *Fast Cycle* and *Fast Track* versions of these programs. Additional research could be conducted to determine if the outcomes would be the same with the standard versions (e.g., *Horizons A* vs. *Reading Mastery I*).

Engelmann (2000) states "*Reading Mastery* and *Horizons* are different in specific details, not in their overall capacity to teach children who meet entry requirements for them" (p. 26). The present study provides some empirical evidence to support this statement. It offers additional research on Direct Instruction programs and specifically for *Horizons*, a recent addition to the collection of DI reading programs.

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Notes

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