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The Effect of the Intensity of Spelling Instruction for Elementary Students At Risk for School Failure

Abstract: This study investigated the effects of two levels of intensity (one lesson per day or two lessons per day) of a spelling intervention on students at risk for school failure. A quasi-experimental group design with random assignment was used. Elementary-level participants (n = 39) enrolled in a 4-week summer remedial program progressed through the study in homogenous groups. Student performance was assessed using both standardized and curriculum-based measures. Findings indicated no significant difference on standardized measures between or within participants across levels of intensity of spelling instruction. However, on curriculum-based measures, a significant difference was found within participants over time, but no significant difference was found between those who received one lesson per day and those who received two lessons per day.

Being able to spell correctly is necessary for success in academic activities. It is not surprising, however, that many children and adults have difficulty with spelling given the irregular patterns and excessive exceptions to the rules of the English language (Adams, 1990; Graham, Harris, & Fink-Chorzempa, 2003). Limited spelling skills can influence students' capacity to express ideas in writing and may hinder their writing fluency, proficiency, and self-confidence (Graham, 1999; Graham & Voth, 1990). Deno, Marston, and Mirkin (1982) demonstrated that as students' proficiency in spelling increases, so does the number of words they write. Moreover, when difficulties are demonstrated, spelling is difficult to remediate (Wilson, Cone, Bradley, & Reese, 1986). Research continues to demonstrate that students with disabilities and those at risk for school failure who are taught spelling skills through an explicit rule-based system outperform those who are not (Darch, Kim, Johnson, & James, 2000; Darch & Simpson, 1990; Owens, Fredrick, & Shippen, 2004).

Students who experience frequent academic failure, including spelling, may avoid engagement causing them to miss out on even more opportunities to learn. Carnine, Silbert, Kame'enui, and Tarver (2004) argue that the first step to increasing engagement of students at risk for school failure is to develop techniques that demonstrate they can succeed. To motivate students, the teacher has to teach the skills necessary to succeed directly. Using a highly structured instructional format permits extensive practice in a portion of the time afforded by traditional instruction (Adams & Engelmann, 1996; Engelmann, 1999).

Spelling skills are typically acquired through developmental stages (Gentry, 1985). In Stage 1, children randomly scribble forms that may be letter-like in an attempt to represent written language. During this "precommunicative

Journal of Direct Instruction, Vol. 8, No. 1, pp. 19-28. Address correspondence to Margaret Shippen at shippme@auburn.edu.

spelling" stage, children begin to form letters, although there is no indication of phoneme-grapheme understanding. In Stage 2, "semi-phonetic spelling" is used to convey meaning as children learn that letters represent sounds. During Stage 3, or "phonetic spelling," attempts to spell are based mostly on sound, and children begin to follow grammatical rules associated with language. Stage 4, "transitional spelling," is associated with a dramatic increase in correctly spelled words. Children begin to form visual images of how words should appear. During Stage 5, referred to as "correct spelling," children begin to apply basic rules of English. They demonstrate awareness of spelling errors and increasingly use resource materials such as the dictionary to assist them in the writing process.

Teaching spelling is a complex instructional process involving numerous components (Graham & Harris, 2006). Teachers are expected to (a) instruct students on how to spell phonetically, (b) teach the rules associated with spelling, (c) assist in the memorization of irregular words, and (d) ensure that generalization occurs. Traditionally, spelling activities have included (a) taking a pretest at the beginning of the week to see which words students already know, (b) looking up the words in a dictionary and writing their definitions, (c) writing each word in a sentence, (d) writing each word a prescribed number of times, and (e) taking a final spelling test on Friday (Heron, Okyere, & Miller, 1991).

For the majority of students, traditional spelling instruction may produce the desired results. Unfortunately, traditional approaches for teaching spelling skills to students at risk for school failure have not been consistently effective (Simonsen & Dixon, 2004). In a comprehensive review of handwriting and spelling instruction, Graham (1999) stressed that relying solely on incidental or natural learning approaches for students experiencing writing difficulties is not sufficient. He underscored that these students need "explicit and systematic instruction" (p. 78) as well.

Existing research indicates that explicit instruction in spelling can improve students' spelling. For example, Berninger et al. (1998) examined the effects of seven different spelling treatment groups that provided explicit instruction in making connections between phonological and orthographic awareness (e.g., whole word, whole word and phoneme-letters) on second-graders' writing performance. The different spelling treatments supplemented the regular spelling program. One of the reported findings was that all of the treatments resulted in better spelling. In another study, Graham, Harris, and Fink-Chorzempa (2002) provided supplemental instruction to 60 second-graders experiencing spelling problems. One-half of the students received supplemental instruction in spelling (i.e., explicit instruction in lexical knowledge and knowledge of spelling systems), whereas the other half received extra lessons in math. At the end of the intervention, those who received additional instruction in spelling had improved more in spelling than those who received only additional instruction in math.

In the Berninger et al. (1998) and Graham et al. (2002) studies, the students' regular spelling programs were supplemented with additional instruction and practice in spelling that was explicit. A question that arises is whether increasing the intensity of research-validated explicit treatments for improving the spelling of at-risk learners is a worthwhile endeavor. That is, rather than adding a supplemental program to a regular program it might be more effective to increase the intensity of a program that has been found to be effective for struggling spellers. As such, the purpose of this study was to investigate the effects of the intensity (i.e., one versus two lessons per day) of an explicit and systematic spelling program, Spelling Mastery (Dixon, Engelmann, & Bauer, 1990), on the spelling achievement of students at risk for school failure enrolled in an elementary summer school program. Increasing learning in an effective

and efficient manner is critical as time is of the essence when teaching students who are academically delayed or at risk for school failure. The primary research question was: Is there a differential effect in spelling performance on standardized and curriculum-based measures when students at risk for school failure receive two daily instructional lessons as compared to students who receive one daily instructional lesson in a 4-week summer school program?

Method

Setting and Participants

This study took place in an elementary school located in a small town in east-central Alabama during a summer school program. All students enrolled in the summer school program (N = 39) participated in this study. Participants ranged from 6 to 11 years of age. Two participants (5%) had completed kindergarten, 10 (26%) had completed first grade, 10 (26%) had completed second grade, 9 (23%) had completed third grade, 2 (5%) had completed fourth grade, and 6 (15%) had completed fifth grade. *Spelling Mastery* placement test (Dixon et al., 1990) results indicated that 7 students (18%) placed in Level A, 15 students (39%) placed into Level B, 16 (41%) placed into Level C, and 1 student (2%) placed into Level D. All were receiving services in summer school due to academic failure in reading and/or mathematics.

The three classrooms where the study took place were organized by participant age and grade level. One classroom housed kindergarteners and first-graders; one classroom included second- and third-graders; and one classroom included fourth- and fifth-graders (see Table 1 for demographic data by treatment group). Of the 39 students in the study, 46% were male and 54% were female. Seventy-seven percent of the participants were African American, 21% were European American, and 2% were Asian American. Approximately 75% of the students in the summer school received free and reduced-price meals during the regular school term.

Spelling Instruction

The spelling program selected for this study was *Spelling Mastery* (Dixon et al., 1990). *Spelling Mastery* is a six-level (A-E) Direct Instruction (DI) program that provides a series of lessons explicitly taught to help students master thousands of words. In *Spelling Mastery*, and all DI programs, each new skill is taught and practiced until firm. Then, each skill is reinforced to mastery in subsequent lessons. Skills build upon one another and are not taught in isolation. Standard error correction procedures are found in the program. The program includes a teacher presentation book, consumable student workbooks, word lists, and progress charts. Four levels of *Spelling Mastery* (A-D) were used in this study.

Three main spelling strategies are taught and mastered throughout the *Spelling Mastery* program. They include phonemic awareness (e.g., sounds and sound-symbol correspondence), morphemic awareness (e.g., root words and affixes), and whole words (Dixon et al.). Phonemic awareness is a skill students use to predict spellings for different sounds. Teaching phonemic patterns enables students to recognize word "families." Morphemes are the smallest units of meaning. The morphemic awareness approach teaches affixes (e.g., prefixes, bases, and suffixes). This approach enables students to recognize and produce multisyllabic words. Examples of morphemes introduced include such words as *recover*, *covered*, *recovered*, *repute*, *reputable*, *discover*, *discovered*, and *discoverable.* Many morpheme spellings stay the same. Some morphemes change depending on whether other grammatical rules apply (e.g., final *e* rule). Finally, the whole-word approach teaches irregularly spelled words as whole units of letters or chunks rather than one sound-symbol correspondence at a time. Irregular word instruction requires intensive

memorization to learn the spellings of these words. Irregular words such as *thought* and *through* are taught in this series.

Research Design and Measures

This study employed a quasi-experimental group design with random assignment to level of treatment (one or two lessons per day). Random assignment to treatment was conducted by randomly assigning graduate assistants, who delivered the treatment, to teach either one lesson or two. The experimental groups contained unequal numbers due to the random assignment being conducted at the teacher level rather than at the individual student level. No control group was used.

Both curriculum-based probes and a standardized assessment were used in this study. They included (a) pre- and posttests of the *Test of Written Spelling-4 (TWS-4)* (Larsen, Hammill & Moats, 1999) and (b) the percentage of correct letter sequences (CLS) on eight spelling probes.

The *Test of Written Spelling-4 (TWS-4)* (Larsen, Hammill & Moats, 1999) is a norm-referenced test of spelling having two equivalent forms—A and B. In this study, both forms were used and were counterbalanced. That is, 51% of participants (n = 20) were given Form A as a pretest and Form B as a posttest; 49% of participants (n = 19) were given Form B as a pretest and Form A as a posttest. In the current study, pre- and posttest standard scores on the *TWS-4* were used as a dependent measure. The *TWS-4* mean standard score is 100 with a standard deviation of 15.

Table 1

Participants' Demographic Information

One lesson per day (n = 15)		Two lessons per day (n = 24)	
Characteristic	*n*	Characteristic	*n*
Gender		Gender	
Male	5	Male	13
Female	10	Female	11
Special Programming		Special Programming	
None	7	None	10
Title 1	3	Title 1	7
Special Education Speech	3	Special Education Speech	1
Special Education LD	0	Special Education LD	2
Special Education DD	0	Special Education DD	2
English Language Learner	2	English Language Learner	0
Student Support Team	0	Student Support Team	2
Race		Race	
African American	12	African American	18
European American	2	European American	6
Asian American	1	Asian American	0

Curriculum-based probes were administered twice per week during the 4-week intervention. Probes consisted of 10 words from the *Spelling Mastery* program in which the participant was placed. The probes were dictated by a trained graduate student, used correctly in a sentence, and then dictated again by the graduate student. The probes were developed by the trained graduate students and reviewed by the researchers to correlate with skills taught in the *Spelling Mastery* level in the instructional placement of the participant. Each probe consisted of 10 dictated words that the participant had to write. The probes provided information about participants' error patterns on CLS.

A CLS was calculated and recorded from each of the eight probes; the CLS also served as a dependent measure. CLS is defined as (a) the correct first letter, (b) the correct last letter, or (c) any two correct letters in a row (Owens et al., 2004). For example, the word *cart* is spelled *c-a-r-t*. Writing *c* would be the first CLS. Writing *c-a* is the second CLS. Writing *a-r* is the third CLS, *r-t* is the fourth CLS, and then ending with *t* would be the fifth and final CLS. Therefore, in the word *cart* there are five possible correct letter sequences. If the participant spelled *cart* as *c-r-a-t,* then he or she would get one CLS for *c*, no CLS for *c-a*, no CLS for *a-r*, no CLS for *r-t*, and one CLS for *t* at the end. The participant's probe would be scored as completing two of five possible sequences or 40% accuracy of letter sequencing.

Procedures and Implementation

Prior to the study, none of the students had participated in *Spelling Mastery*. Participants received spelling instruction in the *Spelling Mastery* program in one of two levels (i.e., one lesson of *Spelling Mastery* per day in the participant's placement level of the program or two lessons of *Spelling Mastery* per day in the participant's placement level of the program). The participants progressed through the *Spelling Mastery* program in small groups of no more than seven throughout the intervention. Lessons were taught daily and lasted approximately 15-20 min for one lesson or 30-40 min for two lessons. Probes were administered twice weekly by the graduate assistants.

Participants who received one lesson a day (n = 15) completed 18 *Spelling Mastery* lessons (15% of the program, irrespective of level); those who completed two lessons per day (n = 24) completed 36 lessons (30% of the program, irrespective of level). Placement level was as follows: 7 participants received two lessons per day in Level A; in Level B, five participants received one lesson a day whereas 10 participants received two lessons per day; in Level C, 9 participants received one lesson per day and 7 participants received two lessons per day; and in Level D, 1 participant received one lesson per day.

Training for Graduate Research Assistants

Eight graduate research assistants administered the lessons. Each received training in Direct Instruction (DI) materials while in graduate school as well as had 8 hrs of additional training in *Spelling Mastery* instruction for this project. The primary researcher, who is a trainer in DI, provided two 4-hr trainings in *Spelling Mastery* to all graduate assistants. The first 4-hr training consisted of (a) an overview of the *Spelling Mastery* program, (b) demonstration and practice teaching exercises and lessons in levels A through D, (c) demonstration and practice of correction procedures, and (d) demonstration and practice administering and scoring the *Spelling Mastery* placement tests. The second 4-hr training consisted of (a) an overview of curriculum-based spelling probes, (b) demonstration and practice administering and scoring curriculum-based spelling probes, and (c) demonstration and practice in developing curriculum-based spelling probes. Each graduate assistant developed eight curriculum-based spelling probes for each level of *Spelling Mastery* (A through D) to be used in the study. These

probes were reviewed by the researchers for verification of use prior to administration.

After the initial 8 hrs of training, the researchers held 1-hr individual coaching sessions with each of the graduate students who administered the treatment. Each graduate research assistant was required to demonstrate 100% fidelity in *Spelling Mastery* implementation before beginning the treatment (see Table 2 for a list of required teaching behaviors).

Fidelity of Treatment and Interobserver Agreement

The researchers were in the classroom to calculate interobserver agreement and fidelity of intervention. All were university professors who have been trained in DI. Two observers simultaneously viewed instruction for fidelity completing the observation form. They then determined interobserver agreement by comparing each of their scores on the items on the fidelity checklist. Observation of *Spelling Mastery* instruction occurred for two sessions per week or 44% of the total instructional sessions (see Table 2 for fidelity checklist components).

Fidelity of treatment mean performance was 95% across graduate assistants (range = 80% to 100%). Interobserver agreement was calculated following each observation. The two observers were in agreement 100% of the time about the fidelity of treatment delivery.

Social Validity

Participants completed a four-question Likert-type survey to help establish social validity. The questions on the survey were (a) "I liked

Table 2

Observation Form for Fidelity of Spelling Mastery Implementation

Observer: _____Teacher: _____Date: _____Lesson: _____

The teacher demonstrated each of the following behaviors while implementing a *Spelling Mastery* lesson:

	Exercises		Workbook	
Teaching Behavior Observed	Yes	No	Yes	No
Procedural fluency (following script)				
Signals (visual or auditory cue)				
Correction (all errors/immediate)				
Firm up (starting over/delayed tests)				
Pacing (rapid/steady)				
Number Correct	/5	/5	/5	/5
Percent				

Yes = evidence of behavior demonstrated. **No**= no evidence of behavior demonstrated. **na** = not applicable.

being part of the *Spelling Mastery* program," (b) "I think I am a better speller since I participated in this program," (c) "I think other students would benefit from the *Spelling Mastery* program," and (d) "If I had a choice, I would participate in the *Spelling Mastery* program again." This survey had a range of 1 to 5, one being "strongly disagree," two being "disagree," three being "no opinion," four being "agree," and five being "strongly agree." Participants' responses were confidential. The survey was read to all students and they individually circled their responses.

Ninety percent of participants indicated (e.g., strongly agreed or agreed) that they enjoyed being a part of the *Spelling Mastery* program, and 81% felt they had indeed increased their spelling skills. Eighty-nine percent reported they thought other students would benefit from the *Spelling Mastery* program, and 85% indicated that if they had the choice to do it again, they would choose to participate in the program.

Data Analysis and Results

A 2 (one lesson or two) X 2 (Pre and Post *TWS-4*) repeated measures multivariate analysis of covariance (MANCOVA) was conducted on the *TWS-4*. Age was used as the covariate due to the wide range of participant ages and the literature review noting that spelling skill acquisition is a developmental process (Gentry, 1985). The results of the repeated measures MANCOVA did not indicate a significant difference for the time or group between the pre- and posttests for the *TWS-4*.

A 2 (one lesson or two) X 8 (curriculum-based probes, 1 through 8) repeated measures multivariate analysis of covariance (MANCOVA) was conducted on the curriculum-based probes. Again, the covariate was age. Results of the MANCOVA indicated a statistically significant within-participant main effect for Time, Wilks' lambda L = .45, F (7, 26) = 4.54, p < .01 (see Table 3). Estimates of effect size (ES) indicated a medium effect for time, d = .55. A statistically significant interaction effect was found for Time X Age, Wilks' lambda L = .52, F (7, 26) = 3.37, p < .01. A between-participant effect for Group neared but did not reach statistical significance, p = .056.

Discussion

As stated earlier, the primary research question investigated in this study was: Is there a differential effect in spelling performance on standardized and curriculum-based measures when students at risk for school failure receive two daily instructional lessons as compared to students who receive one daily instructional lesson? Results of this study indicate that all participants, regardless of intensity of instruction, demonstrated statistically significant

Table 3

MANCOVA Table for Probes

			Value	F	Hypothesis df	Error df	Sig.	Effect Size
Within Participants	Time	Wilks' Lambda	.45	4.54	7.00	26.00	.002	.55
	Time X Age	Wilks' Lambda	.52	3.37	7.00	26.00	.011	.48

growth in spelling skills as measured by curriculum-based probes.

These findings are important given that the target participants, students at risk for school failure, showed improvement in spelling skills in a relatively short period. The students who participated in this study were markedly behind in literacy skills as evidenced by their referral to summer school. However, after a 4-week intervention, they showed gains in CLS regardless of intensity of spelling instruction. Additionally, despite the short intervention timeframe, the students perceived themselves as better spellers and that may have positively impacted their confidence in spelling. Perhaps with a longer intervention, these students could have reached even higher spelling performance levels. This study continues to confirm the effectiveness of explicit instruction for struggling spellers, regardless of intensity of intervention.

Given the short amount of time and the limited exposure students had to the program, all participants made gains on curriculum-based measures. Students who are experiencing difficulties in becoming fluent spellers need to be identified and participate in effective intervention and remediation programs (Owens et al., 2004). The current study demonstrates that explicit programs, such as *Spelling Mastery*, may yield more benefit to students at risk for school failure with no need for increased intensity.

In selecting an instructional strategy for spelling, it is important to choose a strategy based on the skills of the students. Students at the initial stages of learning a new skill tend to benefit more from teacher-directed procedures, with the goal of promoting independence. As students become more proficient, instructional techniques that promote maintenance, generalization, and independence are more beneficial (Ellis, Deshler, Lenz, Schumaker, & Clark, 1991; Keel, Fredrick, Hughes, & Owens, 1999). Even with student-directed strategies, students initially benefit from teacher direction until they become efficient in their use of a particular procedure.

As more diverse students are included in the general education classroom, teachers need to have strategies that are both effective and efficient to address the needs of struggling students. The results of this study suggest that short, intensive instruction can improve students' classroom performance. This instruction can be delivered in several different ways. For example, *Spelling Mastery* can be delivered in the general education class or in a resource setting by a classroom teacher or by a trained paraeducator (Owens et al., 2004).

An additional concern for teachers of struggling students is the relationship between spelling and writing. As students' spelling skills increase, their capacity to express their ideas in writing may improve (Deno et al., 1982). Students need to be provided additional opportunities to use spelling words in meaningful composition (Berninger et al., 1998; Graham et al., 2002). Thus, the students' regular core literacy programs should be supplemented with additional explicit instruction with authentic opportunities to practice newly acquired skills.

Teachers should also consider the students' perception of instructional approaches, because this may have the potential to influence their motivation and learning. Teachers face a significant challenge motivating struggling learners. Motivation is crucial to the literacy and learning process (Carnine et al., 2004). If students enjoy the program and think they are benefiting from it, this motivation may increase their levels of engagement. In this study students favorably evaluated the *Spelling Mastery* program. They strongly agreed or agreed that they (a) liked participating in the program, (b) thought they were better spellers as a result of the program, (c) believed other students would benefit from the program, and (d) would choose to participate in the program again. In this age of accountability

ushered in by the *No Child Left Behind Act* (2001), motivating the lowest-performing students, including students at risk, is a critical educational consideration.

This study is not without limitations. First, the small number and heterogeneous nature of the participants may call into question the generalizability of the findings. Second, the short length of the intervention must be considered and viewed with caution. Finally, while the study did employ a quasi-experimental design with random assignment, no control group was assessed. While these are legitimate limitations, the authors believe this line of inquiry (e.g., intensity of instruction) warrants further investigation.

A large body of current research supports Direct Instruction as a valid teaching method (Darch & Simpson, 1990; Owens et al., 2004). However, the amount of research about the intensity of DI has not been thoroughly investigated. Asking questions about the method and intensity of instruction and assessment appear to be areas for further study.

As spelling will continue to be an important literacy component in the education of students at risk for school failure, additional research is needed. Implementing intervention strategies to increase the rate of learning and automaticity is a challenge for both researchers and practitioners. If students progress through developmental stages in spelling skill acquisition (Gentry, 1985), then teachers should not rely solely on approaches that are incidental (Graham, 1999). Through his examination of the literature, Graham determined that although natural and incidental learning play an important role in acquiring spelling skills, teachers also need to teach the necessary skills explicitly, providing sufficient practice activities and feedback. Using proven programs in spelling instruction such as *Spelling Mastery* will support the explicit teaching process.

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