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THE EFFECTS OF THE DAVIS SYMBOL MASTERY SYSTEM TO ASSIST A FOURTH GRADER WITH DYSLEXIA IN SPELLING: A CASE REPORT

By

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ABSTRACT

The purpose of this study was to determine the effectiveness of using the Davis Symbol Mastery Procedure for Words (Davis, 1994) for improving spelling skills. The participant was a fourth-grade male diagnosed with a significant learning disability. The intervention consisted of having the participant write each word, its definition, the word in a sentence for context, creating a pictorial representation of the word, and then forming the word from clay. The results demonstrated that the Davis Symbol Mastery Procedure was successful. The procedure was cost effective and required little training to implement. Possible additional classroom suggestions for using the Davis Symbol Mastery procedure were made.

Keywords: Davis Symbol Mastery, Learning Disabilities, Spelling, Classroom Research, Multiple Baseline Design.

INTRODUCTION

Literacy is commonly agreed to be a skill required for success in school and in life (Carnine, Silbert, Kameenui, & Tarver, 2004; Graham, 1999; McLaughlin & Vacha, 1992). The ability to read, write, and spell affects achievement in all school subject areas as well as other life pursuits such as communication, leisure activities, and vocational pursuits (McLaughlin, Weber, & Barretto, 2004). By setting the goal that every child should learn to read by 3rd grade, the federal government has supported the idea that literacy is a top priority. Specifically, the cornerstone of the No Child Left Behind program is the Reading First program (http://ed.gov/nclb).

Students with a learning disability are among the most at risk for low achievement in literacy skills. Learning disabilities comprise over 50 percent of the special education population within the public schools today (Heward, 2012). It is of the utmost importance for teachers to provide specially designed instruction and accommodations to meet the unique needs of students with learning disabilities (Wanzek, Vaughn, Wexler, Swanson, Edmonds, & Kim, 2006). Otherwise, these students are at a greater risk of dropping out and/or dealing with low self-esteem (Chambers, Dunn, & Rabren, 2004).

Dyslexia, considered a co-morbidity of a specific learning disability, is a neurological condition, which affects the reading and spelling capabilities of individuals affected by the disorder (Heward, 2012). Essentially, people with dyslexia mentally process words and ideas using "nonverbal conceptualization" which means they think with mental pictures instead of making the connection with written words and sounds (Davis 1994). This can cause problems when academic demands include written language.

A system developed by dyslexia expert Ronald Davis seeks to help students with dyslexia overcome their learning disability. This system trains them to create mental pictures associated with written words. For many students with learning disabilities, visual images, in the form of physical drawings, have helped to enhance recall (Buceta, Campos, & Iglesia, 2006). The Davis System specifically has been empirically shown to increase word recognition for students with dyslexia (Pfeiffer, Davis, Kellogg, Hern, McLaughlin, & Curry, 2001). The purpose of this study was to determine the effectiveness of the Davis Symbol Mastery System in helping a student with dyslexia improve his skills in spelling.

Method

Participant and Setting

Our participant, Dylynn, was a 9-year-old male who attended an urban public elementary school in the

Pacific Northwest. The school psychologist identified him as having a learning disability. A clinical psychologist also diagnosed him with dyslexia. Because of these deficits, he received 60 minutes of specialized instruction each day in the resource room at his school. Standardized and informal assessment determined his reading skills to be at approximately first grade level. His spelling skills were also at a first grade level as indicated by his performance on the schools district's leveled spelling assessment. Dylynn was very cooperative throughout the study.

Sessions were conducted either in a partitioned off section of the resource room or in an unused mini computer lab located down the hall. Both locations were generally free from distraction. Other students and teachers were usually nearby, but not within the immediate vicinity. The student came to receive instruction from the researcher, who was the student teacher in the resource classroom, every school day from 10:15 to 11:15 a.m., barring absences or other school activities such as assemblies.

Materials

The materials required for this study included a small blank journal, the second grade core word list, blank notebook paper, pencils, a dictionary, and modeling clay. All of these materials were freely available in the classroom, so no extra costs were incurred for this study.

Target Behavior

The target behavior was the correct spelling of words written on paper by the participant as dictated by the researcher. A word was considered correct when it matched the dictionary spelling.

Data Collection and Interobserver Agreement

Permanent product recording was used as the method of data collection for this study. The permanent product was the number of written whole words spelled correctly according to dictionary spelling. The researcher administered the written spelling test for each session. After the session was over, the primary observer checked the responses, counted the number of words spelled correctly for each of the sets administered, and recorded this on the data collection sheet.

Interobserver agreement data were collected for all of the sessions. The secondary observer graded each test independently. The percentage of agreement on the number of correctly spelled words for each set was calculated. The method used for computing agreement scores was point-by point agreement ratio. The mean agreement score obtained was 100%.

Experimental Design and Conditions

A multiple baseline design (Kazdin, 2010) across sets of spelling words was used for this case report. Each of the five sets consisted of 10 words were taken from the district-generated second grade core word list. Baseline for Set 1 consisted of 1 session. For Sets 2, 3, 4, and 5 baseline was measured for 3 to 10 sessions. The Davis System was likewise implemented in a staggered fashion and for 10 sessions on Set 1, 12 sessions on Set 2, 8 sessions on Set 3, and 4 sessions for Set 4. Due to conclusion of the first author's student teaching, no sessions for Set 5 could be implemented.

Baseline

At the beginning of the study, the participant was given a pretest, which included 50-second grade spelling words. The purpose of this pretest was to determine the student's level of achievement on second grade words, and to help decide whether these words warranted intervention. To conduct the pretest, the experimenter verbally read each word to the student at a normal rate and also said a short sentence, which included the word in order to give the word context. The student wrote each word on a piece of notebook paper. He was allowed to take a few short breaks, each after approximately 20 words. The first author provided general praise throughout for hard work and persistence.

Davis Symbol Mastery Procedure for Words

After one session of baseline for the first set (the pretest), intervention for the first set of words began. One to three new words were presented per session. For each word the procedure was as follows. First, Dylynn wrote the word in his journal. Then he looked the word up in a dictionary and wrote the pronunciation and a definition. Next he drew a picture, which demonstrated the meaning of the word to him. Finally, he formed the word using clay, spelled the

word aloud, and then repeated its meaning. This entire procedure usually took 10 to 15 minutes per word. After a word was presented once in this manner, most future sessions included just a brief review of that rule. This brief review consisted of the student looking over the previous words in his journal, reading each and spelling them aloud.

After going through the procedure for the words for each session, the participant was allowed to take a short break (30s to 2 minutes) before the spelling test. The test administered included all sets of words for intervention as well as one or two sets still in baseline. Most tests had a total of 20 or 30 words. The first author read the words, said them in a sentence, and then the student wrote them on a sheet of paper.

Data Collection and Interobserver Agreement

Permanent product recording was used as the method of data collection for this study. The permanent product was the number of written whole words spelled correctly according to dictionary spelling. The first author administered the written spelling test for each session. After the session was over, the primary observer rechecked the responses, counted the number of words spelled correctly for each of the sets administered, and recorded this on the data collection sheet.

Interobserver agreement data were collected for all of the sessions. A second observer regraded each test independently. The percentage of agreement on the number of correctly spelled words for each set was calculated. The method used for computing agreement scores was point-by point agreement ratio. The mean agreement score obtained was 100% between the two graders.

Results

The results of the study are demonstrated in Figure 1. A description of the outcomes by condition follows. The results obtained for Word Set 1 are shown in the top figure, Word Set 2 second figure from the top, word set 3 results are in the third figure, the results for Word Set 4 are shown in the forth figure and the results for Word Set 5 are in the bottom Figure. For Word Set 1, Dylan correctly spelled only

one word out of ten during baseline. During the intervention for Set 1, Dylynn improved until he was able to spell 10 out of 10 words for two sessions in a row. His average score for Set 2 during baseline was 1.0 with a range of 0 to 2. For Set 2, his spelling scores increased (range from 8 to 9 words). For Set 3 he averaged 2.67 correct with a range from 2 to 3 for baseline. After instruction using Davis, Dylynn was able to master Set 3 words with 100% accuracy, His spelling for Set 3 during baseline averaged 2.33 with a range from 2 to 3. His performance increased to 90 percent correct with the Davis System in place. For Set 5, he averaged .33 words with a range from 0 to 1 during baseline.
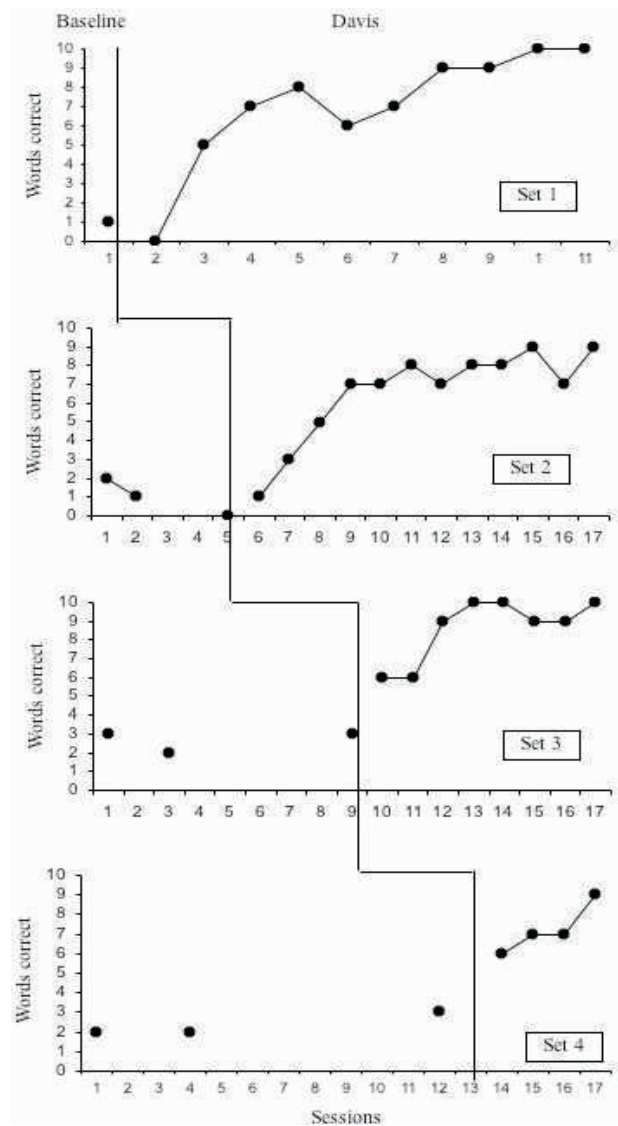

Figure 1. The Number of Words Correct Per Set (1-4) During Baseline and the Modified Davis Procedure

Discussion

Dylynn's improvement suggests that the use of Davis Symbol Mastery as intervention on the student's spelling skills has merit. Dylynn clearly was able to consistently spell words for which he had performed the Davis procedure whereas before he had very low achievement levels with those words. He also seemed to develop a sense of ownership over his learning of spelling words. He consistently worked hard and demonstrated creativity in his drawings and clay formations of the words. Further, he showed enthusiasm for this method of learning. This was another sign of success for the study.

The intervention was quite practical. Only a few materials were required and all were readily available in the classroom setting. Also the Davis procedure was not complex. All the directions and guidelines for the intervention were clearly found in the Davis Symbol Mastery System Handbook, but even those were not needed after the first session. The student was quickly able to proceed through the steps of the process without direction from the first author. Data collection and analysis was easy to carry out. as the target behavior was in the form of a permanent product (McLaughlin, 1993). Also, the use of a multiple baseline design across sets of words was easy for the first author to understand and implement. This type of design is quite attractive to school personnel for such reasons. The Davis method of intervention is geared toward use by anyone, so does not require any professional training.

Recommendations and Implications

Maintenance of treatment gains (Stokes & Baer, 1977) remains a very important factor in classroom action research. To help Dylynn retain and advance in his spelling skills, the special education teacher indicated she would continue using the Davis System with the participant. Another strategy would be to have his general education teacher implement such a procedure in the classroom.

One major weakness of this study was its duration across time. The study took place within the confines of a single academic semester, and so was unable to examine the long-term success of the Davis system. This time constraint also prevented intervention on the fifth set of words. Finally, no maintenance or generalization data were collected with our participant. An additional weakness was that we only measured the effectiveness of the Davis procedure with one participant. It is our view that having more participants would have increased the validity of the study.

Additional research questions remain. First, can the Davis procedure be employed in spelling for more than a single student? How does the Davis system compare to teaching children with learning disabilities spelling with such evidence-based approaches as cover, copy, and compare (McLaughlin & Skinner, 1996; Murphy, Hern, Williams, & McLaughlin, 1990; Skinner, McLaughlin, & Logan, 1997), using partial lists and daily testing, (Guza & McLaughlin, 1987), or employing peer tutors, (Greenwood, Delquadri, & Hall, 1989; Muirhead & McLaughlin, 1990)? Additional research dealing with these issues will have to take place. A study where the Davis procedure and cover, copy, and compare were alternated across work lists or sessions should be of interest. When we have used a modified cover, copy, and compare system for vocabulary instruction (Malone & McLaughlin, 1997), middle school students refused to stop employing such a system because of its effectiveness and carried out these procedures at home.

The results of this study were socially important for the participant. Because Dylynn improved his skills in spelling, he was able to begin to close the gap between his work and that of his peers. As mentioned in the introduction, literacy skills are one of the biggest indicators of further academic success.

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