

## THE EFFECTS OF AN ERROR DRILL PROCEDURE ON THE SIGHT-WORD READING SKILLS OF AN ELEMENTARY STUDENT WITH SEVERE BEHAVIOR DISORDERS

AMANDA MUNIZ<sup>1</sup>

T. F. LAUGHLIN<sup>2</sup>

Department of Special Education  
Gonzaga University

**Abstract:** *The purpose of this study was to increase a special education student's sight-word reading skills. Both correct and error words were measured. The student involved in this case study was a 9-year old male with severe behavior disorders. The study was conducted in a self-contained intermediate age classroom for the behaviorally impaired in large urban school district in Eastern Washington. The results showed a significant increase of correct sight-words read aloud and a significant decrease in the number of errors. Follow-up comparisons were also statistically significant between the first baseline and error drill for both corrects and errors. The participant's corrects and errors did not change when baseline conditions were again employed. The benefits and difficulties of employing error drill and subsequent inclass evaluation procedures with intermediate age children with disabilities were discussed.*

**Keywords:** *error drill, precision teaching, sight words, ABA experimental design, classroom research, severe behavior disorders*

### Introduction

Literacy is very important in today's schools (National Reading Panel, 2000). The importance of reading in one's schooling has been suggested by several researchers (Carnine, Silbert, Kameenui, & Traver, 2004). The use of evidence-based procedures to improve the skills of all children remains a high priority goal of our public schools (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005). The lack of reading skills has been later associated with difficulties in employment, education level, economic standing, and with the law (Greenwood, Delquadri, & Hall, 1989; Slavin, 1989).

### Review of Literature

The use of error correction as well as error drill has been suggested as an evidenced-based teaching procedure in reading (Abrams & McLaughlin, 1997; Carnine et al., 2004; Casey, McLaughlin, Weber, & Everson, 2003; Conley, Derby, Roberts-Gwinn, Weber, & McLaughlin, 2004; Gregori & McLaughlin, 1996), spelling (Dagdag, McLaughlin, & Weber, 2002; Kearney & Drabman, 1992; McLaughlin, Reiter, Mabee, & Byram, 1991; McLaughlin, Weber, & Derby,

in press; Skinner, Logan, & McLaughlin, 1997) math (Bolich, Kavon, McLaughlin, Williams, & Urlacher, 1991; Skinner, Ford, & Yunker, 1981; Stading, Williams, & McLaughlin, 1996; Stone, McLaughlin, & Weber, 2002), and handwriting (DeAngelis, McLaughlin, & Sweeney, 1995). Many effective academic interventions make use of error correction and error drill (Carnine et al., 2004; McLaughlin & Skinner, 1997, Skinner et al., 1997; Swanson, 1999).

The purpose of this study was to increase the sight-word reading ability for a child with a significant academic deficit in reading. We felt that the child's increased ability to read will improve not only his social, but academic skills. We also hypothesized that using an error and drill procedure would increase the child's ability to read sight-words presented on flashcards. Finally, we wanted to provide an additional replication of Casey et al., (2003) using error drill with a student with severe behavior disorders.

## **Methodology**

### **Participant and Setting**

Our participant in this study was a 9-year-old male enrolled in the 4th grade. He attended an elementary school in Eastern Washington. The child was diagnosed with Bi-polar Disorder by a licensed clinical psychologist, and according to teacher and the school psychologist displayed very low academic skills in all areas of the curriculum. The child's special education teacher reported that the child had the lowest reading ability within the classroom and would need to most assistance to achieve his IEP goals in reading.

The setting for the study was a self-contained classroom for children with behavior disorders. The number of students in the classroom had a ranged from 7 to 10 students at any time during the school day. There was usually one certified special education teacher, two instructional aides, and a student teacher (first author) working in the classroom throughout the school day.

### **Materials**

The materials needed for this study were data observation sheets made up for this specific study, and specially made flashcards with a combination of the 3rd grade Dolch sight words and the school specific 4th grade core words.

### **Dependent Variable and Data Collection**

The first dependent variable of corrects was defined as the child saying the correct word to the printed symbol on a flashcard. He had 2s to make such a response. The second dependent measure was errors. Errors were scored if the child failed to correctly respond with 2s or mispronounced the word. Both corrects and errors were recorded by the first author. These data were recorded as scatter plot data.

The sessions took place at several different occasions during the school day, usually during reading time. When the first author held up a flashcard the student would then read the word aloud. Words that were read correctly were put aside and words read incorrectly were placed back into the stack of sight words.

### **Experimental Design and Conditions**

This study used an ABA reversal design (Kazdin, 2011). The first baseline was implemented for three sessions. After the baseline, an intervention phase was implemented. This phase lasted ten sessions. After the ten sessions, the baseline was re-implemented as a reversal for four sessions. A return to error drill was not possible as the student teaching experience came to a close with the ending of semester at the local university.

In order to find the appropriate level to begin working with this student on many different words were used to begin with. The student was tested on words from the 2nd, and 3rd grade Dolch sight word lists, and the core words from the 4th grade before words were selected from on a combination of words from the 3rd grade Dolch sight-word list, and the 4th grade school specific core word list.

**Baseline.** During the first baseline, the first author took the child to a separate table within the classroom and gave him his flashcards. The student's ability to read the words was not as poor as expected but was still significantly lower than grade level. The student was given short breaks to help relieve his stress from the situation. Corrects and errors were ignored during the baseline testing, praise was given to help the child remain on-task.

**Error drill.** The first author put into place an error drill procedure contingent upon the child incorrectly reading off of a flashcard. When the participant made an error the experimenter would correct the child, ask the child "What word is this?", and then move the card a couple back from the front. When this card was read again it was again placed a couple of cards back from the top of the list. The child had to read this word five times correctly before it was put aside as being correct and completed. This procedure would be repeated for any word that the child missed.

**Baseline 2.** This was a replication of the first baseline condition. It was in effect for four sessions. This was carried out to see if the changes in the participant's skills in reading would decline over time.

### **Reliability of Measurement**

To collect interobserver agreement data, a teaching assistant and the first author took data simultaneously but independently from each other. Interobserver reliability was taken for 33%, or one out of every three sessions. The number of agreements between the observers was found

and then divided into the total number of agreements plus disagreements and then multiplied by 100. The mean interobserver agreement was 89% (range 74 to 100%).

## Findings

The results of this study are displayed in Table 1. The number of correct and error sight words across the conditions are presented.

*Table 1. The Mean, Standard Deviation for each of the experimental conditions for both corrects and errors.*

Conditions	Mean Corrects	Mean for Errors	SD Corrects and Errors
Baseline 1	100.33	29.667	4.041
Error Drill	123.00	8.667	3.645
Baseline 2	127.00	3.00	.957

During the baseline, when the first author worked with the child one-on-one within the classroom setting, the number of words read correctly ranged from 96 to 104 with an overall mean of 100.3. His errors ranged from 26 to 34 with an overall mean of 27.67 in baseline.

With the implementation of the error drill procedure, the child's corrects increased to a mean of 125 with a range of 101 to 128. For errors, his average number of errors declined to 5.0 (range of 1 to 13). When the error drill procedure was removed Baseline 2, the child's corrects remained high ( $M = 127.3$ ; range 126 to 128). His errors remained low ( $M = 2.667$ ; range 2 to 4). A Repeated Analysis of Variance with conditions (Siegel, 1956) was calculated. There was a significant treatment effect ( $F = 783.084$ ;  $df = 5$ ;  $p = .0001$ ). All follow up comparisons using a Fisher PLSD Test were significant except for corrects and errors between error drill and baseline 2.

## Conclusion

Through the use of an error drill procedure contingent upon incorrectly read sight words, the student was reading significantly better and showing more self-confidence towards the end of this study. The student knew the words well enough towards the end of this study that he was even self-correcting and telling the experimenter when he missed a word. The data collected during this study supported the hypothesis that an error and drill procedure contingent upon incorrectly read sight-words would increase the number or correctly read words. It also replicated much of our prior work in reading (Abrams & McLaughlin, 1995; Gregori & McLaughlin, 1996) math (Stone et al., 2002) spelling (Carter, McLaughlin, Derby, Schuler, & Everman, 2011; Hubbert, Weber, & McLaughlin, 2000; Stading et al., 1996) and handwriting (DeAngelis et al., 1995).

The strengths of this study were its low cost, ease of implementation, and outcomes. Making the flashcards was the most difficult part but only took a short period of time. Flashcards and error drill became part of the everyday classroom procedure and the participant enjoyed the procedure. The results of using a reversal design study proved that using the error and drill procedure was successful and corrects and errors did not change when a return to baseline was carried out. We have also found this to be the case when using self-tutoring procedures such as cover, copy, and compare (Conley et al., 2004). Also, placing the various sight words into sets and employing error drill in a staggered fashion as we have done in prior research would be a way to demonstrate experimental control without needing a return to baseline. We have employed a multiple baseline design across sets of problems in much of our earlier work (Crowley, McLaughlin, & Kahn, in press; Erbey, McLaughlin, Derby, & Everson, 2011; Ehlers, McLaughlin, Derby, & Rinaldi, 2012; Lund, McLaughlin, Derby, & Everson, 2012; Mann, McLaughlin, Williams, Derby, & Everson, 2012).

The weaknesses of this study involved the amount of time that needed to be set aside to create the flashcards. Also other students began to envy the participant because of the one-on-one time involved. This was due to the fact that there were 130 flashcards to be used. This took a great deal of time to go through the list each session. This was especially true, once the error drill procedure was in effect. It sometimes would last more than 30 minutes. The staff felt this was beginning to take away from class time. Other students in the class would also feel a little left out sometimes during this study. Like most children, they wanted to have some one-on-one time with the first author or one of the classroom staff. The authors would have liked to extend this case report to involve more difficult words, but due to time constraints was not feasible.

### **Suggestions and Recommendations**

For future recommendations, the authors suggest educators to continue use flashcards with an error drill procedure. This is especially important in reading where the child may be having problems. The use of evidence based evaluation procedures has been suggested here and elsewhere (Hawkins & Hursh, 1992; Hawkins & Mathews, 1999; Horner et al., 2005; McLaughlin, B. F. Williams, R. L. Williams, Derby, Peck, Weber, & Bjordahl, 1999). Another suggestion would be to reduce the number of flashcards/words that the child would be reading at one time. Doing such should reduce the teacher time needed and should make such easier to implement in the classroom. This procedure should be implemented and evaluated in such curricular areas as math, geography, social studies, handwriting, and spelling. Also it is our suggestion that flashcards should be evaluated with wide variety of student populations. Finally, we have again combined the use of precision teaching methodology (West, Young, & Spooner, 1990) with error correction. Unfortunately, we were unable to generate rate measures for either corrects or errors. This was due to the difficulty in generating such a measure with all of the other activities taking place in the classroom. In the future, we would urge the use of correct and error rates as they remain very sensitive to various interventions and are viewed by many (West

et al., 1990) as the primary measure when employing precision teaching procedures.

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