The Effects of the Copy, Cover, and Compare Procedure in Spelling with an Elementary Student with Fetal Alcohol Syndrome*

Molly Gryiec

Sharon Grandy

T. F. McLaughlin
Gonzaga University

This study examined the effectiveness of the cover, copy, and compare drill and practice procedure on the number of correct and error words in spelling with an elementary school student with Fetal Alcohol Syndrome (FAS). An AB time series design was employed to examine the copy, cover, and compare procedure. The cover, copy, and compare procedure did improve the frequency of correct words spelled and decreased the participant's errors. An examination of outcomes indicated some variability in the participant's performance during the copy, cover, and compare intervention. The applicability of copy, cover, and compare for use with student with FAS is discussed.

DESCRIPTORS: Copy-cover-compare procedure, Fetal Alcohol Syndrome

Fetal Alcohol Syndrome (FAS) presents one of the most dramatic and severe impacts on the education of children (Burgess & Streissguth, 1992; McLaughlin, Williams, Howard, & Williams, 1995). It has also been one of the most extensively researched and documented problems in North America (McLaughlin, Williams, & Howard, 1998; Streissguth, 1994, 1997; Williams, Howard, McLaughlin, 1994). Exposure to other substances such as marijuana, heroin, methamphetamine, tobacco, and caffeine also have documented deleterious effects of greater and lesser degrees along the continuum with children. Of these pharmacological teratogens, marijuana and alcohol have been identified as the most frequently used secondary drugs in the general population (Hingson et al., 1982).

While considerable attention has been paid to the characteristics and needs of children who have FAS/FAE (Burgess & Streissguth, 1992; Griffith, 1992; Streissguth, 1994, 1997), there continues to be an ever increasing number of children with such a disability. Since these children display problems which are both complex and in many cases severe, there are no easy solutions for successfully working with these children (Howard et al., 1994; McLaughlin et al., 1995, 1998). For many parents and educators, management and instructional strategies which can be used in academic and social skills training for other children, may have little impact on this population (Colvin & McLaughlin, 1993; Howard, Williams, & McLaughlin, 1994).

However, it has been suggested and urged (e. g. Howard et al., 1994; McLaughlin et al., 1995, 1998; and Williams et al., 1994) that data-based and effective strategies and teaching procedures be implemented and evaluated with children and youth with FAS. One possible strategy that has strong empirical support with both children with and without disabilities has been the cover, copy, and compare or add-a-word self-practice procedures (McLaughlin & Skinner, 1996; Skinner, Turco, Beatty, & Rasavage, 1989).

Employing the copy, cover, and compare procedure in spelling involves just a small number of steps. First, the student looks at the spelling word. Next, the student covers the word and writes the word from memory. The student then uncovers the stimulus word evaluates their spelling by comparing it to the original word. If the student determines that the spelling of the target word was accurate, the student moves down the list to the next word and repeats the procedure. If the student determines that the word was spelled incorrectly, some type of error correction procedure (e.g., repeat the cover, copy, and compare procedure or write the word and its correct spelling three times in rapid succession, etc.) before going on to the next item (McLaughlin & Skinner 1996; Skinner et al., 1989). For example, Schermerhorn and McLaughlin (1997) examined the use of the copy, cover, and compare procedure

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Requests for reprints should be addressed to T. F. McLaughlin, Ph. D., Department of Special Education, School of Education, Gonzaga University, Spokane, WA 99258-0025 or via e-mail tmclaughlin@soe.gonzaga.edu

completeness, accuracy, and neatness of creative writing homework assignments (Glomb & West, 1990). An error monitoring strategy known as COPS, developed in the learning disability institute at the University of Kansas (Schumaker, Deshler, Alley, & Warner, 1983), proved beneficial to students with learning disabilities in the detection and correction of mechanical errors. Other writing research that indicated self management an effective tool in helping students improve their writing skills include Shannon and Polloway's study (1993) in the COPS error monitoring strategy, which proved beneficial to sixth grade students participating in the study by helping them focus on the mechanics of writing. Thus, using an error monitoring strategy, such as COPS, to help students with learning disabilities become successful and acquire the necessary skills to become competent writers is of great interest.

The advancement of monitoring teacher effectiveness has been enhanced by Precision Teaching. Precision Teaching is a precise and systematic method of evaluating the effects of instruction. One of the basic elements of precision teaching is the use of number of responses per unit of time to monitor the development of fluency (that is, speed plus accuracy and quality) of a learner's work to a performance standard (for example, 20 to 25 words per minute for free writing) (Binder, 1990). Frequency (number of errors/unit of time and number of corrects/unit of time) indicates how well a student can do a task. In addition, fluency facilitates generalization and maintenance of skills, and often has functional implications as well (for example, reading a map).

Precision Teaching uses frequent assessments of learner performances and displays those assessment data on Standard Celeration Charts (Pennypacker, Koenig, & Lindsley, 1972) to allow teachers to evaluate the effectiveness of instruction (Binder, 1990). Many precision teachers and their students use one-minute counting periods when counting and charting performance (Binder, Haughton, & Van Eyk, 1990).

Although gains have been made in the effectiveness of instructional methods for other writing aspects (for example, composing, style) for students with a learning disability, there is limited knowledge of the strategies needed to assist students to improve their proofreading skills. Self management combined with specific precision teaching qualities (that is, one-minute assessments, Standard Celeration Chart) should offer great potential for helping students with a learning disability acquire proofreading skills.

The purpose of this study was to determine the effects of self managed proofreading on the detection of capitalization errors, punctuation errors, and spelling errors. Specifically, this study investigated whether using self managed proofreading involving a visual prompt and written cues affected the number of mechanical errors detected and the number of errors corrected by students with a learning disability.

The following questions were the focus of this study: (a) What effect will practice sheets have on students' detecting mechanical errors on experimenter- prepared writing samples? (b) What effect will practice sheets have on students' error correction on experimenter-prepared writing samples? (c) What effect will self managed proofreading have on students' detecting mechanical errors on experimenter prepared writing samples? (d) What effect will self managed proofreading have on students' error correction on experimenter prepared writing samples? (e) What effect will self managed proofreading have on students' maintaining proofreading skills on experimenter prepared writing samples after instruction has been terminated? (f) What effect will the use of experimenter-prepared writing samples have on the type of mechanical errors detected by students with learning disabilities over the course of the study?

METHOD

Participants

The experimenter selected seven students with specific learning disabilities. The specific learning disabilities were documented by school records (such as grades, performance in class) and diagnostic testing in accordance with state guidelines for student eligibility for special education services. Criteria for participant selection included: (a) teacher identification of students who had experienced difficulty in the mechanics of writing, (b) teacher recommendation that these students would benefit from error monitoring instruction and self managed proofreading, and (c) students' willingness and parental permission to participate in the study. All students participating in the study were eleven-year old males. Two students were in fourth grade and five students were in the fifth grade. Two students were African-American and five students were Caucasian.

Setting and Materials

The study was conducted in an urban elementary school with an approximate enrollment of 400 students in grades K 5 located in the midwest. The individualized assessment and instructional sessions were held in either of two separate, quiet, well lit rooms equipped with a table and three chairs. The rooms were large enough to

on spelling performance with an entire combination fifth-and sixth-grade parochial school class. The students copied their spelling words, wrote the word and their attempt at spelling the word on the same sheet of paper next to the first target word and then checked their word for accuracy. If students made an error, they repeated the procedure. The outcomes in their study indicated significant increases on end of the week posttests.

The copy, cover, and compare procedure has been shown to be effective across a wide range of individuals ranging from college students (Noland, McLaughlin, & Sweeney, 1994) to children with mild disabilities (McLaughlin, Reiter, Mabee, & Byram, 1991; Skinner et al., 1989; Stading, Williams, & McLaughlin, 1996; Murphy, Hern, Williams, & McLaughlin, 1990;1989; Pratt-Struthers, Bartalamay, Williams, & McLaughlin, 1989; Pratt-Struthers, Struthers, & Williams, 1983), to low achievers (McAuley & McLaughlin, 1992). Also it has been shown to assist children learn academic materials in math (Skinner et al., 1989; Skinner, Bamberg, Smith, & Powell, 1993; Stading et al., 1996) social studies (Skinner, Belfiore, & Pierce, 1992), and spelling on end of the week posttests (McAuley & McLaughlin, 1992; Noland et al., 1994; Pratt-Struthers et al., 1989, 1994; Schermerhorn & McLaughlin 1997) and student spelling in creative writing (Pratt-Struthers et al., 1983).

Since we know a great deal about the characteristics of FAS and little about how to effectively work with such children and youth (McLaughlin, et al., 1995, 1998; Streissguth, 1994; Williams, Howard, & McLaughlin, 1994;), the purpose of the present case report was to implement a data-based and effective procedure (the copy, cover, and compare procedure) with a child with documented FAS.

METHOD

Participant and Setting

The participant of the study was a second grade female student enrolled for 60 minutes each day in special education for spelling and language instruction. She was seven years old and attended a medium sized urban elementary school in the Pacific Northwest. The participant matched the state and Federal definition for learning disabilities and as well as fitting the suggested guidelines for FAS. This diagnosis was made by the child's medical doctor. The participant was highly distractible, had poor eye hand coordination, temper tantrums, and displayed marked delays in language, and had weak fine motor skills. The student was also below grade level in spelling and language. All teaching and testing sessions took place in the school's library.

Dependent Variables and Measurement Procedures

The dependent variables were number of words spelled correctly on a spelling test containing 10 words from the Dolch list used in the district. The first two authors administered the student her spelling exams and kept a permanent copy of her performance for each session. Data were collected from two to three times a week for approximately 10 to 20 minutes per session across seven weeks.

Experimental Design and Conditions

An AB design (Kazdin, 1982) was utilized in the study to assess the effects of the cover, copy, and compare procedure.

Baseline. Baseline consisted of two spelling tests on separate days to establish correct and error rate for spelling. The words came from the Dolch list. One of the first two authors gave the words to the child by saying the work, using the word in a sentence, and then saying the word again. Data were taken for three data days.

Cover, copy, and compare. During the cover, copy, and compare procedure. The student copied the word and wrote its spelling, covered the word and wrote the words spelling from memory. After the student wrote the problem correct for three days, the word was removed and another word from the Dolch list was added. The form that was employed can be seen in Figure 1. The student was not timed. This condition was in effect for six weeks with from 2 to 3 sessions taking place each week of school.

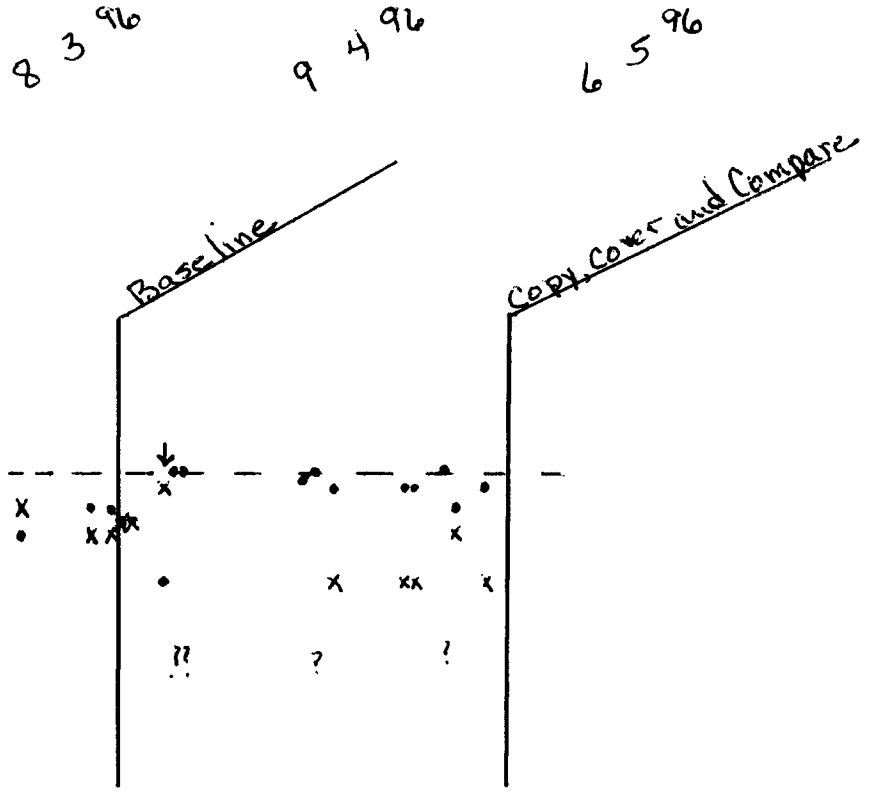
Reliability of Measurement

Reliability of measurement was taken for each session. The tests were regraded and the words were copied to another sheet of paper so the previous grading marks could not be used by the other grader. If both persons scored the word in the same manner, it was scored as an agreement. Any discrepancies were scored as disagreements. Reliability of measurement was 100%.

RESULTS

Frequency of Correct and Error Words

The number of words spelled correctly or as an error for each of the sessions can be seen in Figure 2. The mean number of words correct for baseline was 5.33, while the mean number of errors was 4.67. With the implementation of the copy, cover, and compare procedure, the number of corrects increased while the number of errors decreased. The mean number of correct words dur-



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Gonzaga University Sp. Ed. Molly G. Sharon G. McLaughlin

ing the copy, cover, and compare phase was 7.31, range 2 to 10. The number of error words also decreased to an average of 2.69, (range 0 to 5) during this phase.

Percent Correct

Overall percent correct for baseline was just 53.3% (range 40 to 60%). During copy, cover, and compare the participant's accuracy increased to an average of 73.1% (range 20 to 100%). The overall mean percent for errors was 47.7% in baseline and 26.9% for the copy, cover, and compare condition.

DISCUSSION

The overall outcomes indicated an increase the number words spelled correctly from the Dolch list as well as a reduction over time in the number of errors in spelling the target words. The participant's response to the copy, cover, and compare procedure was erratic at times. For some sessions the student did very well, while on other sessions such as Session 11, the participant's performance was variable and erratic. A discussion with the classroom teacher revealed that the child had been sent to an out of class time out twice that day. In addition, during some sessions, the student was highly irritable and distractible, these are some of the typical characteristics found in children with FAS (McLaughlin et al., 1995; Streissguth, 1994. 1997).

An analysis of the data between the frequency of corrects and errors to that of percent correct provides one with a very different picture. The more accurate outcomes can be seen when correct and error frequency are plotted over time (See Figure 2). The overall mean percent for both corrects and errors was misleading. The use of averages as well as percent correct with its ceiling effect has been suggested as a highly suspect manner in which to evaluate intervention strategies (Kunzelmann, Cohen, Hutten, Martin, & Mingo, 1970).

The present paper does provide some beginning evidence that data-based and effective intervention strategies such as the cover, copy, and compare procedure developed by C. H. Skinner and his colleagues can improve the frequency of correctly spelled words as well as reduce the error frequencies for a young child with FAS. The erratic performance of the participant reported in the present case report, clearly warrants further analysis. Anecdotally, the first two authors felt that some of the variability in performance was due to the fact that they could not come each day and work with the child. Also, like many students with attention deficits, there were some days when other things in the school environment seem to occupy her.

There were several positive features of employing Precision Teaching procedures with copy, cover, and compare. First is was easy for us to implement and carry out. The procedures themselves also allowed for a permanent product of the outcomes to be developed and displayed. This material could be valuable information in the IEP process. Finally, we observed that the child appeared to look forward to the arrival and teaching the drill and practice by the first two authors. The use of the Standard Celeration Chart made is possible to determine and inform the teacher of the child's progress over time. This was done at the end of each session.

We and others have urged that children with FAS, due to the severity of the syndrome, receive the best possible teaching and intervention strategies (Howard et al., 1994; McLaughlin et al., 1995, 1998; Williams et al., 1994). The present case report begins that process. Clearly, more detailed and long term studies are warranted.

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