AN EVALUATION OF COPY COVER AND COMPARE SPELLING INTERVENTION FOR AN ELEMENTARY STUDENT WITH LEARNING DISABILITIES: A REPLICATION

By

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ABSTRACT

The purpose of this study was to increase the spelling performance for a 4th grade student with learning disabilities. The second objective was to replicate the document with the efficacy of Copy, Cover, and Compare (CCC) in spelling. The study was conducted in a resource room in a low socio-economic school in the Pacific Northwest. The skill assessed was the number correct spelling words taken from a classroom constructed spelling worksheet. The results showed and increase in number scored correctly when CCC was in effect for each of five sets of spelling words. Using the Percent of Non-overlapping Data points, (PND), the authors also determined that CCC was a very effective intervention. These outcomes replicate other research dealing with CCC.

Keywords: Copy, Cover, Compare, Learning Disabilities, Spelling, Percent of Non-overlapping Data Points (NDP), Effect Size, Classroom Research.

INTRODUCTION

High stakes testing has become a driving force behind the curriculum selection in America's public schools (Bracey, 2002; Ravitch, 2010). Even with such an emphasis, more students are below grade level in their basic skills. It remains very important that classroom research focus on sources of low academic achievement for all students (Marchand-Martella, Slocum, & Martella, 2004). This is very important in such academic areas as reading (Carnine, Silbert, Kameenui, Tarver, 2006), math (Stein, Kinder, Silbert, & Carnine, 2006), spelling (Swanson, Carson, & Lee, 1996; Swanson, Harris, & Graham, 2013), and handwriting.

Fulk and Stormont-Spurgin (1995) completed a literature review of nearly 38 spelling studies. Their results are that "nearly all 'systematic' instructional techniques can be used to improve the spelling of disabled students" (p. 509). Even with the vast variation in instructional methods, 35 of their 38 studies resulted in heightened spelling performance, positive attitudes toward spelling, and/or improvements in on-task behavior. A more recent examination of evidence-based spelling interventions (McLaughlin, Weber, & Barretto, 2004) noted that copy, cover, and compare or cover, copy, compare (CCC) procedures are successful across a wide range of disability designations and with words across subject-matter areas. Recently, researchers found this same outcome with CCC when they reviewed the peer-reviewed literature (McLaughlin, Weber, & Derby, 2013). In addition, a meta-analysis of CCC by Joseph and colleagues reported that, CCC has been effective across a wide range of student populations and discrete academic skills such as math facts, sight words, and spelling. It is also reported that, CCC has been the most often implemented to improve the spelling of students with and without disabilities.

Literature Review

CCC procedures have generated a great deal of research verification. They have been successful in spelling (McAuley & McLaughlin, 1992; McLaughlin et al., 2004; 2013; McLaughlin, Reiter, Mabee, & Byram, 1991); reading (Conley, Derby, Roberts-Gwinn, Weber, & McLaughlin, 2004) and math (Bolich, Kavon, McLaughlin, Williams, & Urlacher, 1995). A recent meta-analysis of

CCC indicated that the effect size was quite large.

CCC is viewed as a procedure with many benefits. It is time efficient in a large classroom or when a student is working independently. CCC includes brief instructional intervals, daily testing, immediate feedback, and high probability of correct responding. It also allows students to self-correct their work and using specific error drill procedures (McLaughlin & Skinner, 1996; Skinner et al., 1997). Studies have shown that self-correction is beneficial in the maintenance of skills learned and for increasing the ease in which skills are learned (Morgan & Jenson, 2001).

CCC has been implemented and evaluated with a large variety of students. CCC has also been adapted for the use in several subject matter areas such as spelling, math, and geography (Skinner, McLaughlin, & Logan, 1997). Recently, researchers have employed CCC with and without modifications to teach handwriting (Harvey, Conner-Boyle, McLaughlin, Derby, Weber, & Sanders, 2015; Klee, McLaughlin, Derby, Weber, Donica, & Kalb, 2015; Steele, E., McLaughlin, T. F., Derby, K. M., Weber, K. P., Donica, D., and McKenzie, M., 2015).

CCC has been employed for students with autism (Barberio-Kitts, McLaughlin, Neyman, Worcester, & Cartmell, 2014; Ivicek-Cordes, McLaughlin, Derby, & Higgins, 2012; Weber, McLaughlin, Cozza, & Millersmith, 2013), behavior disorders (Carter, McLaughlin, Derby, Schuler, & Everman, 2011; Cieslar, McLaughlin, & Derby, 2008; Hubbert, Weber, & McLaughlin, 2000; McLaughlin et al., 1991; Skinner, Belfiore, & Pierce, 1992) intellectual disabilities (McLaughlin, Reiter, Mabee, & Byram, 1991; Murphy, Hern, Williams, & McLaughlin, 1990; Stading, Williams, & McLaughlin, 1996; Zielinski, McLaughlin, & Derby, 2012) and moderate to severe disabilities (Membrey, McLaughlin, Derby, & Antcliff, 2011).

Purpose of the Study

The purpose of this study was to evaluate the effects of copy, cover and compare in increasing fluency while decreasing errors in the spelling of 3rd grade core words for a 4th grade student with a significant academic deficit in spelling. The child's increased ability to perform basic spelling words will increase the child's confidence across reading and writing areas and will help prepare him for more complex tasks. The first author hypothesized that, using CCC spelling worksheets would increase the child's fluency and decrease his errors on the spelling of 3rd grade core words. An additional purpose was to provide a replication and extension of CCC as suggested by Jasny, Chin, Chong, and Vignieri, (2011), Nosek, Alter, Banks, Borsboom, Bowman, Breckler, Yarkoni, 2015 and Kazdin (2011). Replication provides evidence available via peer review as well as behavioral researchers as the amount of confidence that one can have regarding a particular procedure or intervention (Johnston & Pennypacker, 2009; Kazdin, 2011).

Method

Participant and Setting

The participant for this study is an elementary-aged male student who qualified for special education services in reading and writing. Our participant was enrolled in the 4th grade and was 9 years of age. According to his classroom teacher and standardized testing, his academic skills in both reading and writing were well below the grade level. Therefore, research for this study was in alignment with the participants' reading and writing Individualized Educational Plan (IEP) goals.

The study was conducted in an elementary school in the Pacific Northwest. Testing took place in the intermediate resource room in the students' school. The resource room, classroom provided instruction for 4th through 6th grade students. The number of students in the classroom varied at any time during the school day. This ranged from two to 16 students. There was one Instructional Aide (IA), one student teacher, three practicum students and one special education certified teacher present in the resource room at any given time.

Tools and Materials

The materials needed to facilitate this study included a Copy Cover and Compare template. This template consisted of five columns marked: Words to Practice, Copy & Say Word, Cover & Say Word, a check column, and an Error Correction column (Konrad & Joseph, 2014;

McLaughlin & Skinner 1996, Skinner et al., 1997).

The CCC spelling list was a compilation of 60 different spelling words. These words were broken down into six sets of 10 spelling words in each set. With each set, there was a pre-test to determine which words were placed on the CCC worksheet. Researcher's target behavior was gathered from a daily post-test administered to the student after completion of his CCC worksheet. The spelling words used in the worksheet were based on the 3rd grade core words list obtained from the special education classroom teacher.

Dependent Variables and Measurement Procedures

The dependent variable for this study is the number correct words based on the post-test for each set of 10 words. The participant practiced the same set of words, and then took a test on those words. The first author recorded the post-test by circling the words missed per set on the completed page. These results were then charted on a graph. The sessions were completed once a day before 2-3 School days a week. The student was asked to sit down and write words that were orally given to him. The student was then asked to complete a CCC worksheet using words spelled incorrectly. After the student has completed the CCC worksheet a post-test was given of all words in that, and any previously learned sets. These sessions were not timed.

Throughout the duration of the study, the participant completed his spelling using the CCC format, in order to increase his accuracy. The student was given a set of 10 spelling words. These words were presented in a pre-test with words containing errors added to a copy, cover and compare worksheet to be completed by the student. The order of the words varied to reduce the possibility of the participant learning the order of the words rather than how to spell them. Upon the completion of the worksheet, the student was tested on that set of words and any other previously mastered set. These data were then employed to determine the effects of either baseline or CCC.

The second measure was the percent of Non-overlapping Data Points (NDP). This was completed to assess the efficacy of CCC for the participant (Scruggs & Mastropieri, 2013, 2001; Scruggs, Mastropieri, & Casto, 1987). This was carried out, by comparing the overlap of data points for baseline and CCC. This was done for each set and for the total number of data points in baseline and CCC for the entire study.

Experimental Design and Conditions

The efficacy of CCC was determined through the use of a combination of multiple baseline and AB design (Kazdin, 2011; McLaughlin, 1983). A description of each is given as follows.

Baseline

The level the first author chose was based on discussion with the resource room teacher, the General Education teacher and the participants' current spelling performance. The student was orally given a pre-test of the first three sets of spelling words and told to write them down to the best of his ability. The student completed three baseline tests in order to ensure the first author was starting the participant at the correct level. However, the student was given appropriate praise and prompting when necessary to help him stay on task and focused. The number of sessions of baseline ranged from 1 to 5 sessions.

Copy, Cover, and Compare (CCC)

The first author would give the copy, cover, and compare worksheet after the participant completed the pre-test. The participant completed a new worksheet with each new set of words. The practice test was not scored or timed. Upon completion of the CCC worksheet, the participant was tested on all words in that, and any previously mastered sets.

Inter-Grader Agreement and Reliability of Measurement for the Dependent Variable

Inter-grader agreement was taken during baseline and when the participant took his post tests. It was done independently. This was calculated by taking the number of corrects between the first author and the total number of errors made by the student on the worksheet, and then multiplied by 100. The percent in inter-grader or scorer reliability was 100%.

The reliability of implementing the baseline and CCC was

determined by examining the CCC and baseline sheets for another person familiar with action research in the classroom completed by a local private university in the public schools (McLaughlin, B. Williams, Williams, Peck, Derby, Bjordahl, & Weber, 1999). Based on the scoring and items written down by the first author and participant, each session implemented was described by McLaughlin and Skinner (1996).

Results

Sets

The results of this study showed that using the CCC format increased accuracy for the participant. Figure 1 shows that only 3 out of 10 words were spelled correctly during baseline for Set 1. When CCC worksheets for Set 1, the participant averaged 9 out of 10 words with a range of 7 to 10 words. For Set 2, the number of correct words spelled in baseline for Set 2 ranged from 4 to 5 words correct in baseline with a mean of 2.75 words. When CCC was implemented, an increase in the number of words spelled correctly was found (M = 9.0; range 7 to 10 words correct). With Set 3, the number of words spelled correctly in baseline ranged from 2 to 4 with a mean of 3.4 words. When CCC was in effect, his performance improved (M = 8.0; range = 7 to 9 words spelled correctly). After a single session of baseline for Sets 4 and 5, CCC was implemented. An increase from baseline was found in both sets. The average for both sets was 6.0 for baseline. However, overall accuracy increased for Set 4 (M = 8.0; range 6 to 10) as well as for Set 5 (M = 7.3; range 5 to 9 words correct).

Non-overlapping Data Points

For all of the sets, we had one overlapping data point. This indicated that CCC was highly effective (95.6%). However, for each set, only Set 4 had an overlapping data point. Since the number of sessions for the baseline was only one, caution is required here.

Discussion

The outcomes with the participant indicated that CCC was an effective strategy for helping a single student with learning disabilities to improve his spelling accuracy. There was an overall improvement in spelling for each set of words that were employed during CCC. In addition, the use of NDP indicated that, for the participant, CCC was a highly effective procedure overall, and for four of five sets

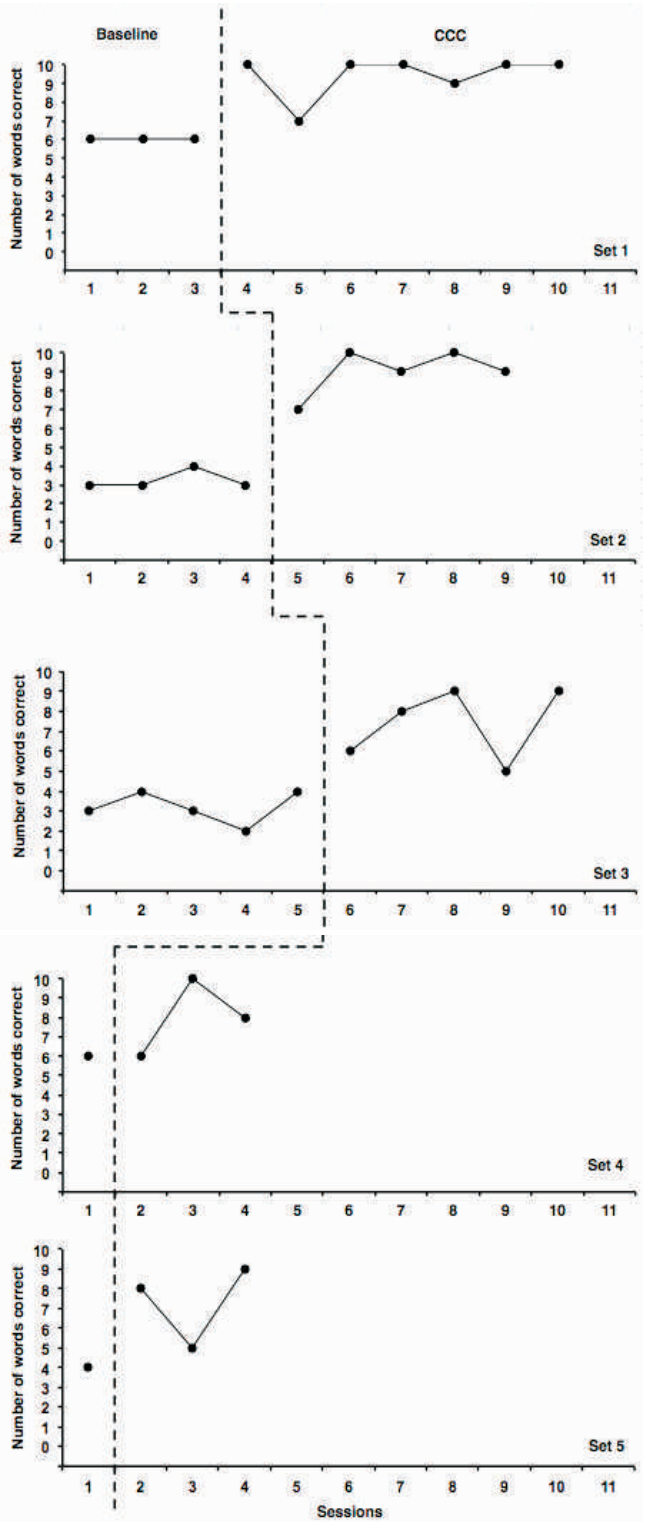

Figure 1. The Number Words Spelled Correctly In Baseline and CCC For Our Participant.

of words (Scruggs & Mastropieri, 2013, 2001). Set 4 was the only set with an overlapping data point. Data for that set using NDP indicated that CCC was not effective. However, only one data point was employed and caution is needed (Scruggs et al., 1987). Employing NDP gives a researcher some additional tools to evaluate interventions.

There were a few factors that attributed to the variability in results during CCC. For example, extra time was required to implement CCC and take data for baseline in the other sets. We have urged elsewhere (Barberio-Kitts et al., 2014) of taking fewer data points in baseline when there are a several sets still in baseline. The first author and the participant felt this impacted the results. In the present case report, the student and first author decided to work together in the morning before school to allow data for more time together data for all sets. However, the participant failed to come to school early on six different occasions. Clearly, some type of contingency arrangement would be appropriate. Another consideration was the participants' willingness to work. Some days the participant showed up, but refused to work on spelling. While eventually making the decision to work, much time was lost on these days and the participant hurried through the words making little or no effort to consider the accuracy of his spelling. Clearly, these issues should have been addressed. However, with the first author's completion of student teaching, this did not occur. Even with these issues, CCC was a very powerful intervention.

Conclusions

The present outcomes replicated much of the past research with CCC for spelling (Hubbert et al., 2000; McLaughlin et al., 1991; Murphy et al., 1984; Zielinski et al., 2012) and that of other researchers Konrad & Joseph, 2014; Skinner et al., 1991, 1992). Again, this adds power and confidence for employing CCC when teachers and other school personnel are looking for procedures that can improve spelling for a wide range of students. Also, the outcomes provide another replication of CCC. Several authors have commented regarding the critical importance of replication in both behavioral sciences (Johnston & Pennypacker, 2009; Kazdin, 2011) as well as other fields of study in science (Jasny et al., 2011; Nosek et al., 2015)

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