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THE EFFECTS OF COVER, COPY, AND COMPARE SPELLING EMPLOYING REREADING, SOUNDING OUT, AND STUDENT SELECTED REWARDS FOR TWO STUDENTS WITH MILD INTELLECTUAL DISABILITIES ‡‡‡

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ABSTRACT

The purpose of this study was to increase accuracy and reach mastery in appropriately leveled spelling words for two male intermediate elementary school students in a self-contained special classroom. The dependent variable was the percent correct on in-class spelling tests. The effects of the cover, copy, and compare (CCC) procedure with student-selected rewards were evaluated in a multiple baseline across students. The results showed an increase in correct spelling when CCC with student-selected rewards was employed. When retention was assessed at the end of data collection, there was only a small decline in student accuracy in spelling. The use of a whole group consequence for carrying out the procedures correctly, made the process quite favorable for the entire class. The benefits and issues regarding the use of CCC for spelling mastery and response maintenance are discussed.

Keywords:cover, copy, and compare, spelling, students with disabilities, intellectual disabilities, single case research design, classroom action research.

INTRODUCTION

Spelling is an essential and complex skill involving multiple components and strategies for spelling must be motivating as well as effective and efficient (Graham & Freeman, 1987; McLaughlin, Weber, &Barretto, 2004; Nies&Belfiore 2006). There have been several classroom procedures that have been shown to improve the spelling across a wide range of student populations (Gettinger 1985, 1994; McLaughlin et al., 2003). Also, empirical research has indicated that not all approaches to spelling are effective or evidence-based (Arra& Aaron, 2001; Cates, Skinner, Watson, Meadows, Weaver, & Jackson, 2003; Gettinger, 1994; Kearney &Drabman, 1982).

One evidence-based strategy (Rathvon, 2008) that has received some attention in the literature has been cover, copy, and compare (CCC) or add-a-word spelling procedure (McLaughlin & Skinner, 1996; Skinner, McLaughlin, & Logan, 1997). McLaughlin and Skinner (1996) defined steps of CCC as: (1) looking at the academic stimulus, (2) covering the academic stimulus, (3) making the academic response, (4) uncovering the original academic stimulus, and (5) evaluating academic response in reference to the academic stimulus. If the student's response is correct, the student moves on to the next word. If the response was incorrect, or there was no response, error correction occurs; which consists of writing or saying the correct response correctly three times.

CCC has been successfully employed to improve student performance in geography (Skinner, Belfiore, & Pierce, 1992), mathematics (Becker, McLaughlin, Weber, Derby, & Gower, 2010; Ciesler, McLaughlin, & Derby, 2008; Poff, McLaughlin, Derby, & King, 2012; Skinner, Ford, &Yunker, 1991; Skinner, Turco, Beatty, &Rasavage, 1989; Stading, Williams, & McLaughlin, 1996), reading of sight words (Kaufman, McLaughlin, Derby, & Waco, 2011), and spelling (Carter, McLaughlin, Derby,

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Schuler, &Everman, 2011; Hubbert, Weber, & McLaughlin, 2000; McLaughlin, Reiter, Mabee, &Byram, 1991; Murphy, Hern, Williams, & McLaughlin, 1984; Pratt-Struthers, Bartalamay, Williams, & McLaughlin, 1989). CCC has been implemented and evaluated in general education classrooms, as well as resource room or self-contained classroom settings. This method has been proven effective with typically developing general education students (Schermerhorn& McLaughlin, 1997), students identified as having behavior disorders (Skinner et al., 1992), mild or moderate intellectual disabilities (McLaughlin et al., 1996; Membrey, McLaughlin, Derby, &Antcliff, 2011), or as having a learning disabilities (Becker, McLaughlin, Weber, & Gower, 2010; Murphy, Hern, McLaughlin, & Williams, 1990; Skarr, McLaughlin, Derby, Meade, & Williams, in press; Stading et al., 1996).

CCC has been shown to be highly effective with students with a wide range of disabilities. While it is important to show the efficacy of CCC with students with intellectual disabilities, we wanted to evaluate CCC with a population of students (mild intellectual disabilities) that has not been employed in most prior CCC research. In addition, it is also important for these students master the material presented in order to retain that information and generalize the knowledge or skill over. The purpose of this study was to increase accuracy and reach mastery in appropriately leveled spelling words for two male intermediate elementary school special education students in a self-contained classroom. We also assessed maintenance of student spelling on end of the week tests and with all the words that were trained.

METHOD

Participants and Setting

There were two participants in this study. Student 1 was a 10-year-old male in the fifth grade enrolled in a self-contained special education classroom for intermediate grade school students. He was diagnosed with attention deficit hyperactivity disorder (ADHD) and mild intellectual disabilities. Student 2 was a 12-year-old male in the sixth grade that was enrolled in the same setting. He was diagnosed with mild intellectual disabilities. Both students demonstrated significant deficits in spelling developmentally appropriate words. The classroom teacher felt these two children would be outstanding subjects for the study, and after baseline observations, the researcher concurred.

Student 1 had IEP goals for reading, math, science and behavior/social skills. While there were no goals directly related to spelling presented itself in his IEP, the letter-sound correspondence in spelling was correlated with his reading goals for the year. Student 1 had been identified and referred by his special education teacher. The teacher asked that the student be observed by the researcher to identify skills that were significantly delayed. Student 2 also had IEP with goals in reading, math and behavior/social skills. Likewise, his spelling was directly correlated to his reading goals for the year. In addition, both Student 1 and 2 were working towards improving their accuracy in spelling as well as working independently and being responsible for organizing their spelling folders with little to no prompting from the adults in the room.

The setting was a self-contained specially designed instruction (DI) intermediate special education classroom. The classroom was located in a large urban elementary school in the Pacific Northwest, and served students with disabilities ranging from autism to medically fragile. There were 12 students, one teacher, one student teacher, and three instructional assistants in the class. The study took place during a short period of time in the morning or immediately following lunch recess at a small table in the classroom. None of the data collection or teaching required the students to leave the room. Students completed the intervention during reading groups or free time. The first author was an attending local private university and seeking an endorsement in special education. She was documenting her skills at meeting state and national standards to improving student performance (McLaughlin, B. Williams, R. Williams et al., 1999; Williams, McLaughlin, Williams, Howard, &Marchand-Martella, 1991).

Materials

This study required specifically designed CCC sheets for 10 spelling words, five separate 10-word lists, a pencil for each student, a spelling folder and student selected consequences. Student 1 chose

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stickers and the opportunity to imitate a professional wrestler's voice as his reward. Student 2 chose stickers and jelly bellies on the last day of the school week for his rewards.

Dependent Variables and Measurement Procedures

The dependent variable was the percent of correct words spelled on a CCC worksheet. There were a total of 10 words on each CCC worksheet. The percent correct out of 100 was indicated at the top of each page by the first author. Correct was defined as having all the letters of the word facing the right direction and in the same order as it appeared in the left hand column on the worksheet. An error was recorded if the student did not include all the letters, formed a letter backward, or included extra letters. Both students had to complete their whole CCC sheet before either received their chosen consequence. On Friday, if the student(s) reached their goal of at least 8 out of 10 correct, jelly belly candies were provided to the whole class with the participants receiving their jelly belly candies first. Percent correct for the last session at the end of the week served as the weekly test for that list. Their spelling lists changed each week.

Experimental Design and Conditions

An ABCDEFA single case design across words was used for this study (Barlow, Nock, &Hersen, 2008; Kazdin, 2010). It was employed to assess the effects of the CCC procedure with individual student-selected rewards and a whole group consequence. Baseline was conducted five sessions for Student 1 and four sessions for Student 2. Interventions were conducted five times during the course of one single school week.

Baseline

During baseline, students were asked to spell words to the best of their ability on lined notebook paper. There was no time limit or prompts provided by the first author. The first author determined the number of correct words for each student on their daily tests.

CCC spelling with rereading, sounding out and student selected rewards

A specially designed list was prepared for each student previous to intervention. A list of 10 words on either lined paper or white computer paper was found in the left pocket of the spelling folder. On top of the list was the current week number and for that week the list of 10 words. The spelling list changed each week. In the right pocket was the specially designed CCC list. This list consisted of 5 columns. In the left most column was a hand-written list of 10 words in alphabetical order.

Beginning on Monday, each student worked with the first author. First, the student was required to read the list of words aloud with the first author. Next, the student was required to re-read the list of words aloud without the first author. If the student came to a word or part of a word they were unable to read independently, the researcher would model the correct pronunciation of the word as well as sound it out the word slowly for the student. Next, the student had to read the word correctly and begin again at the top of the list. This was done to provide extra practice with all of the words rather than just the words the students had difficulty reading orally. Once the students were able to read the list of words independently without an error then the CCC spelling procedures began.

After the students read the entire list, they were then instructed to copy and compare their list of words to that on the left side on the CCC sheet. If the words were typed correctly by the first author, the students had to place a check mark in the small second column beside each word. This step was implemented to given each student additional exposure to the correct written word and to improve their accuracy in self-evaluation. After a check mark was placed in the second column for all 10 words, the student was able to move on to the written portion of on the CCC sheet. Next, the participants examined the previously written word in the first column and independently copied the word into the third column. Their spelling of the word needed to be correct. The student folded the paper so that all the written work was covered and in the same row, the student wrote the word from memory (McLaughlin & Skinner, 1996; Skinner et al., 1997). Once the word was completely written, the students unfolded the paper and compared column 1 to column 4. If the word was spelled correctly the student placed a check in the fifth column and moved to the next word on the list. If the word was misspelled, the student was to place and "X" in the column. The student was required to

rewrite the word correctly three times at the bottom of the page. During the correction procedure, the student was allowed to look at the correctly spelled word in column 1 in order to ensure the correct spelling of the word was practiced. Therefore, the students were required to rewrite their errors correctly three times before moving on to the next word on the list. Once the student made it through each of the 10 words, he handed the paper to the first author to be corrected.

The first author recorded the score and then handed it back to the student and informed them of their score. The student was then required to independently place the completed sheet in their designated spelling folder in the three-ringed section. This was designed especially for these two participants to improve their independence and responsibility in spelling. If the daily sheet was not in the three-ringed portion of the folder at the end of the session when the researcher checked, the student was prompted to correctly complete this task.

Once the paper was filed correctly in the folder, the student was allowed to engage in their preferred activities. Each student was given a sticker to either put on their shirt or on a paper of their choice or even the outside of their locker. Then Student 1 would ask to imitate a professional wrestler's voice. The student would recite the voice for no more than 30s. At that point the researcher told Student 1 it was time to work again and he would use his own voice again to indicate he was finished with his imitation. Student 2 appeared to be quite content with the sticker as an immediate reinforcer, but after each session reminded the researcher of his chance to earn jelly belly's for the whole class. On Fridays, when the goal was reached on the end of the week test, the student was rewarded immediately following lunch recess with jelly belly's first, and then the rest of the class received this reinforcer as well.

Interobserver Agreement and Fidelity Implementation of the Independent Variables

Interobserver agreement was carried out by having a classroom aide regrade a photocopied version of student work. This took place before the first author had graded them. If both scored the word in the same manner, an agreement was scored. Any discrepancy in grading was defined as a disagreement. The percent of intergrader agreement was calculated by dividing the number of agreements by agreements plus disagreements and multiplying by 100. For Student 1 interobserver agreement was taken for 22 out of 35 sessions of the study and for Student 2, interobserver agreement was taken for 23 out of 34 sessions. The percent of intergrader agreement was 100%.

Fidelity of implementation of baseline or the CCC procedure was carried out nine times. The second author came to the classroom and gathered such data. An agreement was scored if either the baseline or CCC procedure was being employed correctly. A deviation in the implementation of either condition was scored as a disagreement. The percent of fidelity for the various experimental conditions (baseline, CCC, or retesting) was 100% across all observations.

RESULTS

The percent correct for each student can be seen in Figures 1 and 2. The last data point in each phase was the end of the week test in spelling for that respective list.

Student 1

In baseline for student 1, his mean percent correct was 28% (range 0 to 50%). With the implementation of CCC, his performance increased. The grand mean for student 1 in the CCC phases was 83.5%. His performance was variable on the first two lists. However, his performance on test day (last session of the list) for List 1 was 90%, a 100% for Lists 2, 3, and 4, and 90% for List 5. His performance during the last phase to assess maintenance of treatment gains (Retest) was 84% (range of 70 to 90%).

Student 2

The baseline performance for student 2 was low (M = 17.5%; range 0 to 30%). When CCC was employed his daily and end of the week accuracy increased. The grand mean for CCC spelling with rereading, sounding out and student-selected rewards for Student 2 was 94.2%. For

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the test day in week 1, Student 2 scored 90%. For week 2 his accuracy was 100% and 94% for week 3. For week 4, his accuracy declined to 80%. During the week 4, Student 2 retained all of his words (100%) from that list. For the last phase, where all the words were employed to assess retention, generalization, and mastery, his mean for this phase was 84% correct (range 70 to 90%).

DISCUSSION

The overall results of this study indicated that using the CCC for spelling improved the accuracy of spelling for two students with delays in spelling. Their performance on their end of the week tests also improved when CCC was employed. The gains that were found for each list decreased somewhat for the retesting phase.

The present outcomes replicate our previous research using CCC (Carter et al., 2011; Ciesler et al., 2008; Hubbert et al., 2000; McAuley& McLaughlin, 1992; McLaughlin et al., 1991; Murphy et al., 1990; Pratt-Struthers et al., 1989; Skarr et al., in press) and that of Skinner and his colleagues using math or geography (Skinner et al., 1989, 1991, 1992). In the present investigation, we were able to successfully employ CCC in a self-contained classroom with students with mild intellectual disabilities.

Spelling performance was variable across word lists and students. Student 1 had difficulty sounding out the words independently for both Lists 1 and 2. However, using one-on-one instruction that focused on letter-sound correspondence and sounding out words, the amount of times necessary to reread the list of 10 words greatly decreased with Student 1. In addition, Student 1 did not understand the vowel sounds that the letter *e*made. He most often guessed on a replacement vowel or left the *e* off of the end of the word. However, by week 5, Student 1 knew the various letter sounds for *e* and also able to make a vowel say its name, an *e* needed to be placed at the end of the word. According to the teaching staff, the time required for each of the participants to sound out and complete their spelling lists decreased over the duration of the study.

Because Student 2 had a slight articulation problem, a large focus of the reading and rereading was teaching him to slow down and annunciate each letter sound. We feel that this resulted in an immediate improvement in his spelling. Once he was able to hear all the sounds, he was able to match the letters with their correct sounds.

After spring break (week 4), Student 1 started a new medication. The new medication had a very negative side effect (increased anger). This increased anger, often lead to extreme frustration when a word was mispronounced or misspelled. This change in his behavior in spelling was noted by every adult in the classroom. However, when one-on-one attention was given and praise was provided for each word spelled correctly and extra rein forcers were given after the completion of 5 words, and then later after 10 words, his performance improved. His change in medication produced some of his lowered test. By the end of week 5 the medication issue was resolved and he was back to his old self.

In addition to academic improvement, social/behavioral improvements were noted by the classroom teacher, instructional aides and first author for each students. By the final week of the study, both students would go to their spelling folders and got the materials ready and waited for the researcher to come listen to them read their lists before each completed their CCC sheets. The piece that held them accountable for the Friday reward for the entire class was, no doubt, was partially responsible for their improvement in this area.

There were limitations in the present investigation. First, was the time that it took away from regular scheduled reading group for each participant. There were several days when students completed their CCC sheets and procedures in lieu of their classroom reading. While this study significantly helped to increase their spelling skills and strategies, it took valuable time away from their reading practice in their group. A second limitation of the study was the reaction of the other students in the class. Because Student 1 and Student 2 were given so much individual time and attention, some of the other students thought it would be great if they too earned some additional instructional time. Unfortunately, the CCC sheets were not developmentally appropriate for all students in the classroom and this could not occur. Therefore the strategy could not be expanded to all members of the class as it has with students with milder disabilities (Lee &Tingstrom, 2006). Specifically, several students in

the class were unable to write legibly or copy dictated words. The third limitation was that brief period of time that retention was assessed at the end of the investigation. A longer time period should have been employed to assess the maintenance of treatment effects. Finally, the CCC intervention also required the use of correct oral reading of the words on each list. The effect of requiring the students to correctly read each word before they were allowed to write each work cannot be determined. Additional research may wish to examine the efficacy of such a procedure in a written CCC procedure. One could examine this in either an alternating treatments design (Barlow et al., 2008) or counterbalancing the presence or absence of that component across students.

The cost of this study was minimal; however the cost did vary with each child due to the fact that they chose their individual consequences. If the rewards were more expensive it was a possibility to discuss alternative ideas such as increased computer time during free activity or other less expensive tangible rewards. The stickers were purchased inexpensively for $1.00 and the jelly belly candy was slightly more expensive. It was estimated that jelly belly candy cost about $7.00 for the entire class and Student 2. However, it is our view, that the positive effects greatly outweighed their monetary cost. Not only did the two participants enjoy the procedures but they were able to share their success with their classmates. Both appeared to enjoy being able to share their success with the entire class each week.

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FIGURES

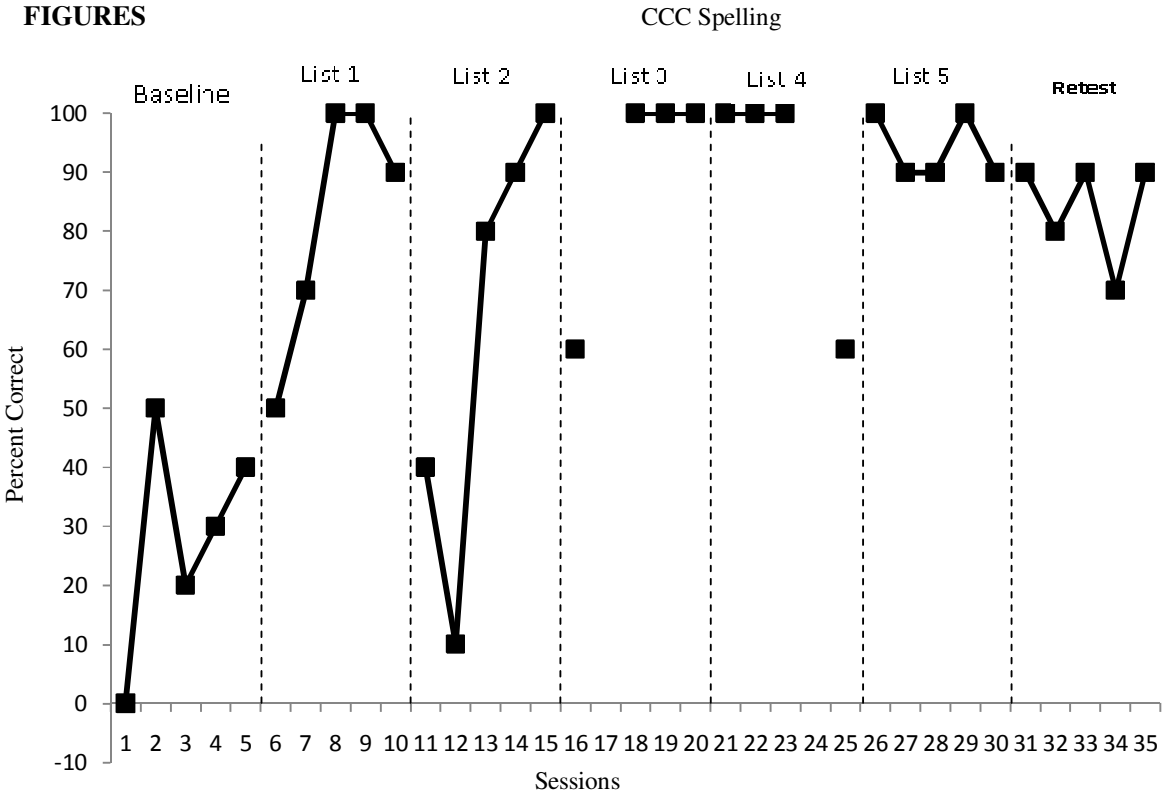

Figure 1.The percent correct for baseline and CCC across five spelling lists and the retest phase for Student 1

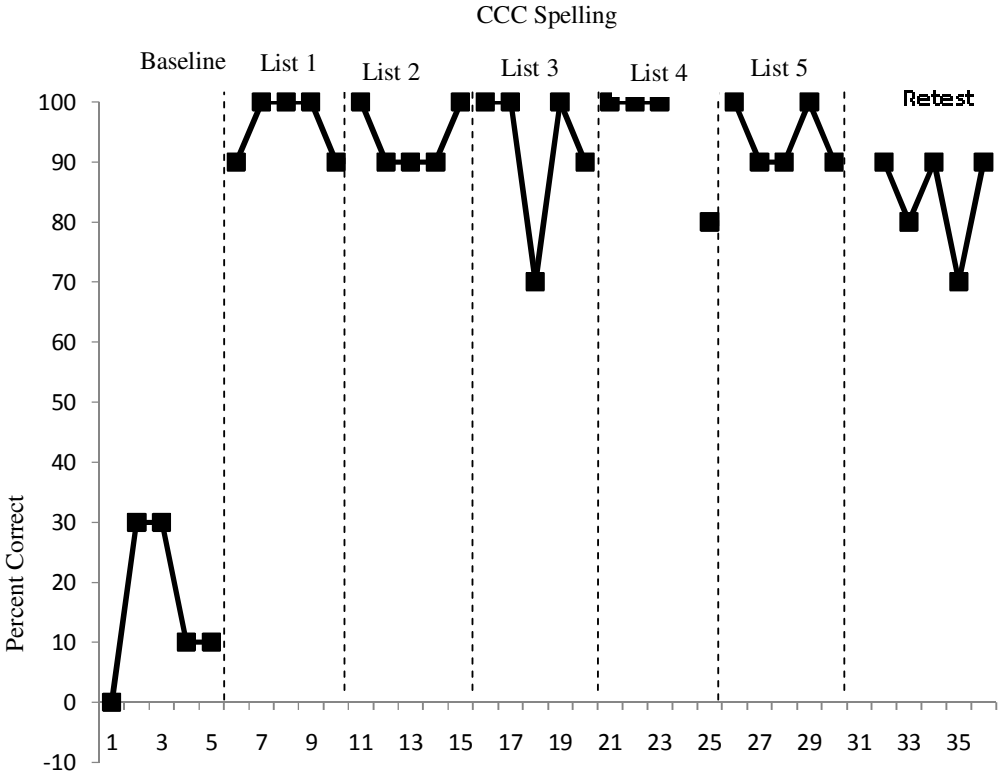

Figure 2.The percent correct for baseline and CCC across five spelling lists and the retest phase for Student 2