

THE EFFECTS OF COVER, COPY, COMPARE WITH TIMING FOR TEACHING SPELLING TO A FOURTH GRADE STUDENT WITH LEARNING DISABILITIES: A CASE REPORT AND REPLICATION

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Abstract: *The purpose of this study was to determine the effectiveness of the cover, copy, compare (CCC) procedure on the spelling performance of a fourth grade student with learning and behavioral issues. Our participant was enrolled at a local elementary school and spent approximately two hours a day in a resource room. Data were gathered in the resource room. A pre-test, baseline tests, CCC procedure and a post-test were implemented. Over the course of the research improvements were measured in amount of words written correctly during CCC. The participant, for the majority, was enthusiastic and enjoyed the process especially when improvements started to be seen.*

Keywords: *spelling, cover, copy, write, compare, CCC, time, fourth-grade, intervention, learning, disability, non-compliance.*

Introduction

Spelling is described as the process of writing or naming the letters of a word, requiring the matching of sounds and letters to effectively convey messages. It is considered by many researchers as a difficult task to perform involving a high level of skill. As described by Graham (2000) spelling is not an easy or engaging task for many students; for students with learning disabilities, it often is a challenging and difficult task that is often avoided. A wide ranging set of component skills is needed for the successful acquisition of English literacy (Vellutino, Jacard, & Chen, 2007) There is general consensus that for alphabetic language, phonological processing skills are important for learning to read and spell in English (Adams & Byrne, 1998). Children who have difficulty with spelling avoid writing and develop a mindset that they cannot write, leading to arrested writing development, in contrast learning about spelling can enhance early reading development by shaping children's knowledge of phonemic awareness, strengthening their grasp of the alphabetic principles, and making sight words easier to remember (Graham et al., 2008).

Numerous procedures have been identified to increase spelling retention and overall effectiveness. Some approaches include the Multisensory Approach, test-study-test technique, fixed and flow lists, personalized systems of instruction for spelling (PSI) (Manfred, McLaughlin, Derby, & Everson, 2015; McLaughlin, 1990) and DI flashcards (McLaughlin et al., 2015). Computer-based instruction (CBI) is another method that increases the effectiveness of spelling. This method has been seen to be effective with those with Autism and other learning disabilities through its ability to provide information visually, incorporate auditory feedback and cueing when needed as

well as its capabilities of individualizing programs to student's own ability levels (Purrazzella & Mchling 2013). Using a computer as a mean of improving spelling increases the child's motivation levels to learn as it is considered a new and exciting method, especially in the classroom. Computer based instruction was used in a research conducted in 2009 using dyslexic children. The aim of the study was to identify if using a computer game incorporating and audio-visual phoneme discrimination task would improve literacy skills (Ecall, Magnan, Bouchafa, & Goomber 2009). Children with Dyslexia and those without, the control group, both played the same computer game. Results proved that using a computer game incorporating an audio-visual phoneme task could improve literacy skills. The dyslexic children progressed more than their counterparts in the control group in the four reading subtests.

In this research, timing the participant during the pre-test and post-test was used to determine if it would help with spelling accuracy and fluency, and especially to enhance the motivation level of the participant. Research has identified that telling a participant that they will be timed (along with other factors such as feedback) during an activity has the ability to improve overall increased writing rate, increased on-task behavior and an increased rate of performance comments made by the child. (Kastelen, Nickel, & McLaughlin, 1984; McLaughlin, 1992; Van Houten, Hill, & Parsons, 1975). It was also used to confirm how many letters/word could be recorded in a certain amount of time and if they were comparable to standards.

Spelling has been linked to literacy. Understanding of how the letters and sounds form words aids in the reading of longer words and development of ideas in writing. In a study, it was stated that "the correlation between spelling and reading comprehension is high because both depend on a common denominator: proficiency with language. The more deeply and thoroughly a student knows a word, the more likely he or she is to recognize it, spell it, define it, and use it appropriately in speech and writing." (Joshi, 2008). The importance of spelling can be the key to a child's self esteem when it comes to their writing and other academic work in school.

Review of Literature

CCC has been described as a self-management strategy used in a way that allows students to practice academic skills such as spelling, math etc repeatedly while allowing self-correction of

errors (McLaughlin & Skinner, 1996; Skinner, McLaughlin, & Logan, 1997). The use of CCC allows students in the classroom to receive immediate feedback on a skill so that incorrect work is not repeatedly practiced the incorrect way. It is a simple and easy procedure to implement that ultimately benefits the learning of students (Murphy, Hern, Williams, & McLaughlin, 1990). The implementation of CCC has been used in research for children in the classroom to improve spelling accuracy and fluency.

CCC involves students first completely copying out the word displayed, after that they cover the word using a hand or object. After doing so they then attempt to write the word out themselves without any assistance. The last step is simply comparing the written word to the word first copied, through doing this the student can clearly identify mistakes. Research has evaluated the effectiveness of CCC in math for students with severe behavior disorders (Manfred et al., 2015; Poff, McLaughlin, Derby, & King 2012) indicated that the use of CCC was effective. The participants were of similar age to the participant used in this study. During the intervention a model was given which the participant was asked to copy. Students then followed the procedure of cover, copy, compare. All participants in this research increased their correct responses and accuracy with certain fractions. Each participant was also able to implement the skills taught within the study to the general classroom (Poff et al., 2012).

The purpose of the present research was to provide a replication of CCC with a single student enrolled in a low-income elementary school (Kazdin, 2011; Nosek, Alter, Banks, Borsboom, Bowman, Breckler, et al., 2015). An additional purpose was to examine the role of combining feedback with CCC on student performance.

Methodology

Participants and Settings

Our participant is a 10-year-old male in fourth grade. The participant displayed learning disabilities in math, reading and writing activities. The participant tested at a first grade level for reading and writing and a third grade level for math. Both significantly below the standards for a fourth grade student. Due to having severe health issues the participant is missing large segments of the school year, hence dropping well below grade level standards. Due to minimal time spent in the classroom setting the participant is usually reluctant to learn as a result of the work being too difficult. The participant displays the inability to concentrate often engaging, or trying to engage with other peers or simply just sitting at a desk refusing to work as a result of not understanding simple instructions, however, when engaged in work the participant works at a very slow pace. The participant has been enrolled in special education since first grade as a means of providing directive instruction to help assist the issues he faces in a regular classroom. The participant has an IEP for all academic areas that identifies current academic level and specific goals that are to be reached within a certain amount of time. From knowledge obtained the participant comes from a below average socio-economic family that doesn't necessarily view

school as an important aspect of his life. The participant was enrolled in a self-contained special education classroom that included other students with learning or behavioral issues. Certain sections of the classroom were divided depending on age ranging from first grade to fifth grade. The participant in this study was generally joined by roughly six other students (varying daily) of the same age showing similar problems with learning. The elementary school the participant attended is located in a relatively low-socioeconomic area in a moderately large city (Spokane, WA), with limited funding provided to the school. The classroom contained three certified teachers who were in charge of different skills and age groups respectively. Sessions with the participant lasted anywhere between 15 to 60 minutes. Each day was unpredictable in terms of how the child would perform; tiredness and willingness to participate were major factors for days that took longer. As a result of busy schedules for both the first author and the health issues of the participant some days involved up to 4 sessions being recorded so that all data could be collected in a decent amount of time. This however may have had an effect on the results that were obtained.

During the research other children were present in the room, as well as the teachers mentioned. The first author and the participant went into a quiet, isolated corner. This was in an attempt to reduce distractions and work at an efficient rate.

Materials

Limited materials were used for this research, they included; roughly 10 pieces of lined blank paper for the pre-test, post-test and baseline tests. On these pieces of paper the numbers 1-20 or 10 depending on what was being gathered, were clearly labeled. A list of core words, words were selected based on the current grade level of the participant. Numerous cover, copy, and compare work sheets, these were created by the first author to see improvements in the participants spelling accuracy throughout the research. Pencils, pens and a timer (phone) were also used during the research to test fluency during the pre and posttests.

Dependent Variables and Measurement

The dependent variable in this study was the number of words spelled correctly on the participant's pre and posttest. Another dependent variable was the time it took for the participant to complete the pre-test and post-tests. Throughout the collection of data no help or assistance was given while the participant attempted to spell words. On occasions, a reward was given that was used in an attempt to maintain participation. These rewards included small candy items such as jolly ranchers, etc. For measurement and to be able to record effectively, correct answers were used with a "check mark" to the right of the word spelt, words spelt incorrect were marked with an "x". All sessions were corrected with a red pen by the first author and a purple pen by the Interobserver agreement individual. Because there were times where the participant did not attend school data was collected in numerous sessions within the one day. This may have altered the results as the participant often lost concentration and enthusiasm towards the research.

The second measure was the percent of overlapping data points. This was employed in an attempt to determine the effectiveness of CCC when compared to each baseline. This measure has been suggested by Scruggs, Mastropieri, and Casto, (1987) as a way to determine intervention effectiveness using single case research designs.

Experimental Design and Conditions

An ABACADAE single case experimental design (Kazdin, 2011) was used to assess the effectiveness of the CCC procedure for spelling words selected according to the child's current level of spelling and grade level. During the pre-test the participant was given a spelling test using 20 words that were chosen from a list of core words, the words were chosen to provide a challenge yet not too difficult to where the participant would become reluctant to work. Providing the participant with a lined piece of paper with numbers 1 to 20 clearly labeled was used to record the pre-test. The words were presented orally by the first author and repeated twice before the student was asked to spell it on its respective number. Before any of this took place the first author conducted an activity that involved asking the participant his understanding of the word. This was in an effort to make sure the participant was fully aware of the meaning and understanding of the words being used. There was no verbal confirmation or praise given to the child if the word was spelt incorrect or correct, during any of the procedures.

After the pre-test was recorded, baseline was recorded. Baseline was recorded 3 times before each intervention, except the first sessions were it was recorded twice. After baseline was recorded the CCC intervention was implemented. The participant was provided with a CCC worksheet. The CCC worksheet was a table with the words chosen to the left and respective columns and lines for each part of CCC. During CCC ten words were selected, the first intervention session the words were selected at random from the original 20. Once a word was mastered the word was removed from upcoming CCC procedures (yet sometimes appeared again to make sure it hadn't been forgotten). This was done in an effort for the participant to learn the harder and more difficult words instead of spending and wasting time rehearsing the ones that were mastered or easy for the participant. Words that were consistently spelt wrong stayed on the list or appeared more often. 11 total sessions using CCC were conducted with 24 overall sessions including the pre-test and post-test examinations. During CCC the student was instructed to read the first word in the column to the left. The words provided were the exact same as the words provided during the pre-test. After reading the word in the left hand column the student then copied out, exactly as he saw it, on the line in the next column. After the participant copied what was seen the participant then covered the two words, and began to write the word individually from memory or by sounding out the word, this was done in the next column. The word was covered using a piece of paper or sometimes the first authors hand. The participant was allowed to sound out the word and take as long as possible. Once the participant had finished writing the word, the hand was removed and the participant compared the word they wrote and the word in the "copy" column. If the word was misspelled it was copied out one more

time in final column, to hopefully instill the correct spelling. If the word was spelled correctly the participant simply moved onto the next word in the list and did not have to re-write it in the “compare” column. During the post-test words were not verbally presented in the same order that had been given during the pre-test. They were said in a random order in a hope that the child had not just memorized the order of the words but how to spell them individually. This identified improvements and areas still needing work. The post-test was completed in the exact same manner as the pre-test.

Interobserver Agreement and Reliability

Interobserver agreement was collected using the same data sheet that was used throughout the entire research. Another person in the classroom was used to correct the spelling tests. The individual was someone who was reliable and efficient when asked to correct spelling tests and was someone readily available for the first author. The exact same technique was used while correcting the tests, a “check mark” was used for corrects and an “x” for incorrect responses. When correcting spelling tests the first author used a red colored pen whereas the reliability marker corrected using purple. Interobserver agreement was collected by dividing the number of agreements by the number of agreements plus disagreements, and then multiplied by 100. By using this method we could identify the reliability of the results. Reliability was taken for all baseline observations as well as the pre and post-tests and just less than half of intervention data. This made up 50% of all sessions. The overall agreement was 100%.

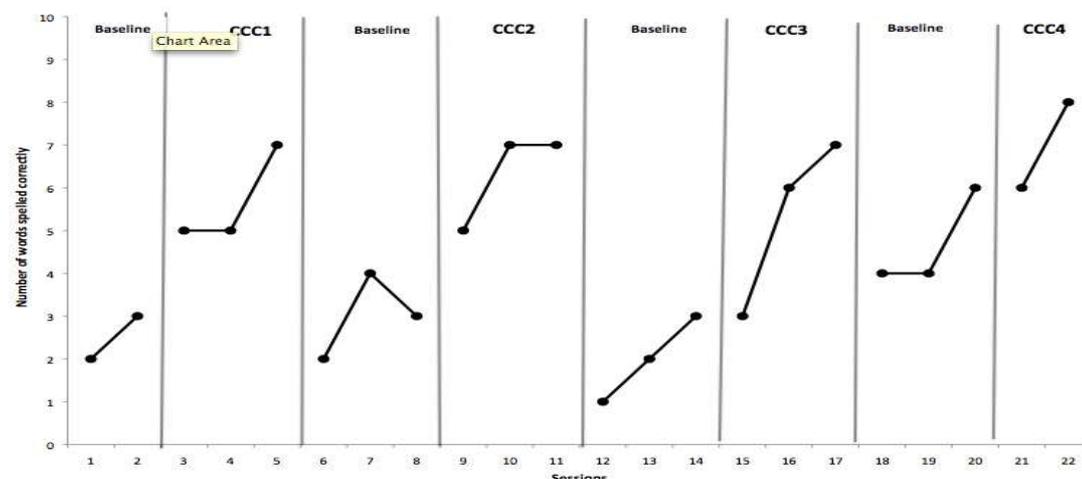
Findings

The study revealed that with the implementation of CCC, improvements and effectiveness with spelling were evident. Comparing both the pre-test and post-test scores, improvements were seen with both words spelled correctly and the decreased speed it took to complete the posttest in comparison to the pre-test. In baseline the participant recorded a 30% of words spelled correctly before intervention. In the first set of baseline the participant spelled 25% of words correctly (5/20). With the same spelling words used in this baseline set the participant improved when CCC was used. With CCC the participant spelled correctly 56% of total words (17/30). In the next recording of baseline, new words were added that provided more of a challenge, those words from the previous baseline collection that were mastered were taken off and those that caused difficulty stayed on. In this baseline the participant spelled correct 30% of words (9/30). Remembering that some words from the previous baseline were still implemented as well as new words. After CCC the participant showed improvement yet again, correctly spelling 63% of total words (19/30). After this recording it became evident more words that had been mastered and those still needing assistance. The same procedure occurred where new words were added for the next baseline data collection. 20% of words were spelled correctly (6/30). This drop in percentage may have been a result of harder words still being presented and the ones that were mastered or easy the participant no longer presented. After CCC was

presented with this new list of words 53% of words were spelled correctly (16/30). In the last recording of baseline and with ultimately the most difficult words, as well as some previously mastered ones, the participant spelled correctly 46% of total words. Once CCC was implemented the participant was able to spell correctly 70% of total words (14/20).

When looking at the pre-test and post-test scores it was very clear that with the implementation of CCC the participant was able to retain the spelling of words. The pre-test scores determined that the participant was able to correctly spell 25% of the words. The pre-test was the first time the participant was presented with the words that would be used throughout the entire research. Only getting correct 5 out of the 20 words was a good baseline so that there was plenty of room for improvements. The post-test scores determined that the participant was able to correctly spell 65% of words. This was without the CCC procedure meaning all words were spelled purely from memory or what the child had learned throughout the research. By obtaining this result the child had a 40% improvement rate. Some of the errors the participant made in the pre-test were minor and only needed small adjustments or reminders on how it should be spelled. By the end of the research, by looking at the post-test, it was evident that the majority of these mistakes have been retained through using CCC. According to standards individuals should be able to hear/write 15-25 dictated words per minute as well as hear/write 80-100 letters per minute. When comparing the times it took complete the pre and post - test it was evident that the participant was still unable to complete 20 words within in a minute, in fact the participant was still relatively off. When taking the pre-test the participant completed spelling all 20 words in 10 minutes and 59 seconds. When looking at the post-test it was clear that significant improvements were made however still largely distant from what the standards suggest. The post-test was completed in 7 minutes and 25 seconds. Thinking pauses and self-doubt took up majority of the time.

Figure 1: The correct for vocabulary during four baselines and four phases of CCC.



The percent of non-overlapping data points each between baseline and CCC was found to be 82%. This would indicate that CCC was an effective intervention (Scruggs & Mastropieri, 2013) for this student and in this classroom.

Conclusion

Suggestions and Recommendations

Although the participant was successful in using CCC, his results varied throughout the data collection. Some sessions it was evident that the participant was engaged and really concentrating on the sounds of words and letter-combinations. Other times especially after a few sessions had already been completed the participant became fatigued and struggled to maintain concentration through the remainder of the sessions. As a result of this, simple mistakes were made that could have been avoided as well as large breaks being taken between spelling words. The pre and post test were purposely conducted on separate days with no other sessions being completed in the same day, this was in an effort to have maximum concentration throughout the tests and so that the results would be more comparable.

It was also evident when working with the participant that basic letter combinations had not been learnt or remembered during the time spent at school. This may have been a result of lack of exposure to text, either at home or as a result of missing so much school that basic skills had not yet been retained. Especially during baseline words were spelled out exactly as they were pronounced when verbally said aloud. During the CCC implementation memorization skills were very poor, even for words with less letters it was a challenge for the participant to remember, for example, silent letters in words were more often than not forgotten very fast as well as basic letter combinations. This procedure became very frustrating for the participant as he was always expecting to succeed once reaching the “compare” section of CCC. The biggest issue noticed through working with the participant was the inability to know where or when silent letters occur. Before creating the list of core words the first author made sure to include words that would be “tricky”, therefore including letter combinations and silent letters. This was in an effort to see what the child already knew and to hopefully improve his spelling ability. Although good amount of improvements were evident it was still clear that this part of spelling needed further assistance. The only letter combination that was comfortable for the participant was “ing”.

Limitations to the present research would include the time available to collect data on the participant. As a result of completing numerous sessions in one day and sometimes the participant not being available may have made the results less reliable. If re-done the first author would have a more organized routine that didn't involve so much data being collected at one time. For the participant this research took away time from his reading and math group.

Although the study did increase his spelling skills the participant may have missed vital learning information from these lessons missed. To remedy this, CCC could have implemented in the general education classroom setting or at home. We have been able to implement CCC in the home for math (Stading, Williams, & McLaughlin, 1997). Another limitation may have been the fact that the words were simply memorized as there were only effectively 20 words used throughout the entire research.

The cost of this study was minimal as a result of all the materials being easily accessible. The first author only needed to provide worksheets for the study to run smoothly; as a result printing was the most strenuous process in this research. The participant appeared to enjoy most of the research and was happy to engage and work with the first author. The participant was pleased to see positive results.

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