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The effects of copy, cover, compare for spelling for a high school student with intellectual disabilities

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Abstract
The purpose of the present case report was to employ copy, cover, and compare [CCC] with a high student with intellectual disabilities. The number of correct spelling words was the dependent variable. The effects of CCC were evaluated in a combination multiple baseline and ABAB design. During baseline, student performance was low. However, when CCC was implemented, our participant's spelling improved. The ease of implementation and evaluation of CCC was discussed.

Keywords: cover, copy compare, intellectual disabilities, spelling, written communication, high school, special education, classroom research

1. Introduction

Research has reported the connections between achievement in primary grades and achievement rates in higher grades [1]. Spelling is a specific area of literacy development in which high achievement is very important for nearly all capacities of secondary education. Seaman [2] defined a spelling deficit as a "student [who] experiences difficulty correctly spelling words in written expression" [2]. Seaman promotes providing individualized spelling tests for reasons such as the inappropriateness of the words from the standard spelling list for the student with special needs, or for the who student who simply needs additional time to complete a dictated spelling test. Kiuru [3] found that individuals with spelling deficits are also "…less likely to attend and graduate from secondary and tertiary education than their peers, or they graduate with significantly lower qualifications. The students have also been found to have somewhat lower rates of employment and lower earnings than their counterparts" [3]. Therefore, spelling is an imperative skill for future graduation and career successes. Cognitive delays are a specific condition that has a severe impact on spelling word achievement at the high school. Typically developing high school students are expected to have near perfect spelling of elementary words, but students with cognitive delays struggle daily with this task. Due to this struggle and frustration, students with cognitive disabilities often take one of two courses of action; heavily criticize themselves for not being able to spell, or simply give up and accept that they will never be a proficient speller. Neither of these courses of action led to success in spelling. Students with cognitive delays need curricula that provides an intense, systematic method for teaching specific spelling strategies [4].Many models of training exist, some of the most successful being those that implement a visual-imagery technique with steps of spelling imitation, spelling rehearsal and recalling words from memory. CCC is one such intervention strategy that includes all these steps. It is an effective intervention method for improving spelling skills [5]. CCC was implemented for this study to increase the target behavior of spelling. The participant had cognitive delays and was part of a Developmentally Impaired classroom spelling words from the word list of a 17-year-old female in a high school with intellectual disabilities. Since CCC has been employed to improve spelling with high school students with severe behavior disorders [6], another purpose was to replicate and extend the efficacy of CCC with a secondary student.

2. Method

2.1 Participant and Setting

The participant was a seventeen-year-old girl who was a junior at a local public high school when the study began. For the purpose of this study, the participant will be referred to as

Bethany. Bethany was diagnosed with a cognitive delay with an IQ of 44. Bethany's specific areas of difficulty were in math, reading, writing, behavior, and communication. Her IEP goal for writing was that she write a complete sentence summarizing a 2nd grade passage. For math, Bethany's IEP goal included successfully completing third grade math equations. For behavior and communication goals, the IEP goal stated that she should stop obsessively talking about television shows and her laughing and giggling at inappropriate times would stop. The reading IEP goal is that Bethany would read 3rd grade passages. Bethany was placed in a self-contained Developmentally Impaired classroom for most of the day except when she was in the general education setting for choir and art classes. The study took place at a large urban public high school in the Inland Northwest. The classroom was a self-contained Developmentally Impaired classroom. This special education classroom worked with students of severe impairments both physically and mentally. Students participated in academic classes in the morning and during the afternoon participated in vocational training around the school grounds. Typically five to seven students were present each day with two instructional assistants and one classroom teacher. The study took place in a back room attached to the classroom or a separate activity room down the hall from the classroom. Both environments were quiet most days and did not have other students present in the room. The researchers conducted the sessions. For this study the two researchers met with the participant two times per week for roughly one hour each from 1:15-2:15 PM, depending on the focus level of the participant on the day, for an eight-week period.

2.2 Materials

The materials used in this study included a spelling list provided by the classroom teacher from Bethany's curriculum, worksheets, pencils, and a notebook. The spelling list was used as a reference [7]. Worksheets made by the researchers, pencils and a notebook were used during intervention. The worksheets were part of the CCC intervention method, while the notebook was used for data collection. In the notebook Bethany would write down the spelling words that the researchers said out loud. Each set of words contained five different words. Set 1 words included party, gravity, process, rely, and racial. Set 2 words were seeds, statement, financial, commercial, and stick. Set 3 words were cohesion, interdependent, respiratory, sacrificial, and circumstantial. Baseline was taken for each set. After three data points of baseline for Set 1, the CCC intervention

2.3 Dependent Variable

The target behavior in this study was number of words spelled correctly A spelling test was used to measure Bethany's progress. The requirements for a correct word were that the specified word must be spelled correctly with all letters in the correct order according to the spelling list and had to be completed without prompting from the researchers, beyond saying the word and using it in a sentence. A word was marked incorrect if any letter was out of order according to the spelling list, if the word was illegible, or if the participant indicated she did not know how to spell the word.

2.4 Data Collection and Inter-observer Agreement

For this study the researchers used a permanent product data collection system. The data collection was administered in the form of a spelling test, which was kept in a spiral notebook. A word from the spelling list was said in random order from test to test, with 10 words total on each test. A wait time of approximately 30 seconds to one minute was given for the participant write the word. If she did not write the word down in this amount of time the word was skipped and marked incorrect. The data was scored on separate data recording sheets for each researcher and was kept independent for inter-observer data purposes. Each researcher tallied how many correct words were spelled per set, by comparing Bethany's list to the master spelling list provided by the teacher. To quantify the recordings, the researchers totaled the number of correct words and divided by the total amount of words presented during the spelling test. Each researcher collected data. Inter-observer agreement data were collected on 16 of 16 sessions, totaling 100% of all baseline and CCC sessions. Due to the permanent product design, the agreement data was scored independently by each observer after the sessions before the school day was finished. The method used for computing agreement scores was point-by-point agreement ratio. Mean agreement was 100% [range 100%-100%].

2.5 Experimental Design

A combination ABAB design and multiple baseline design [8, 9, 10] was used to evaluate the effects of CCC on the spelling accuracy for our participant. Fifteen words were divided into three sets of five words for the study. Three sessions of baseline were taken with Set 1 words, eight sessions of baseline for Set 2 words, and eleven sessions of baseline for Set 3 words. For intervention, Set 1 had nine sessions, Set 2 had seven sessions, and there was no intervention done on Set 3. The decision to move to the next set after Set 1 was after data showed four or more words spelled correctly two consecutive sessions. For Sets 2 and 3, the previous intervened set had to show minimum levels of four words spelled correctly on the spelling test for two sessions was implemented on Set 1. After baseline on Set 1, each session began with CCC worksheets immediately followed by a spelling test that tested all three sets of words, done at the beginning of the study, and was eventually changed to only including one other set not being currently intervened on. A token from the classroom's existing token economy was given to Bethany for each CCC intervention worksheet and each spelling test completed during the study.

2.5.1 Baseline

During baseline the participant was tested on a set of 15 words to assess her current level of spelling skills. These words were provided by the teacher and are part of the student's current curriculum. During the tests the researchers would say the word out loud, use it in a sentence and repeat the word. Bethany would write the word to the best of her ability. The researchers would repeat the word if additional prompting was needed. After the tests the researchers recorded the scores. During baseline no tasks were given to

improve the participant's skills. Praise and tokens were given for effort and completion of spelling tests.

2.5.2 Copy, Cover, Compare [CCC]

This method was used simultaneously with a token economy to help the student master the spelling words. Five correctly spelled words were presented to the participant in writing on the left hand column of a worksheet. As a pre-step, Bethany traced the first word as the researchers said the word out loud. She then copied the word on a column next to the printed word. Additional help was provided when needed to assist memorization of spelling. This help included counting how many letters were in each word and sounding out. Once Bethany copied the word the researchers folded the first column over the second column so no words were visible. The student then wrote the word from memorization. If any spelling errors occurred the student was told the correct spelling and was asked to copy the word correctly five times in a separate notebook. If the word was one the participant had spelled incorrectly more than once, she wrote it ten times in the notebook. The first five times she was able to see the correct spelling of the word and the last five times she would attempt to spell from memory. After the student copied the word five to ten times, the researchers drew a line under the previously missed word on the worksheet, and the student spelled the word from memory again. The student would repeat these steps for the remaining 4 words. After these steps the student was tested on the words for data collection. The token system was implemented during the intervention as reinforcement. A "classroom dollar" was visible on the table throughout the procedure and verbal prompting was given to the participant to increase motivation, such as reminding Bethany that doing good work, focusing and spelling correctly to earn a dollar will allow her to have free time at the end of class.

2.6 Results

Figure 1 displays the number of words spelled correctly during Baseline and the CCC Intervention. The top tier displays the number correct for Set 1 words, the middle tier displays the number correct for Set 2 words and the bottom tier displays the number correct for Set 3 words. The mean number of words spelled correctly during Baseline for Set 1 words was 0. The mean number of words spelled correctly for Set 1 words increased during Intervention to an average of 3 words [range 1-5]. The mean number of words spelled correctly for Set 2 words during Baseline was 0. The mean number of words spelled correctly during Intervention for Set 2 words increased to an average of 4 words [range 0-5]. The mean number of words spelled correctly during Baseline for Set 3 words was 0. This set was not yet intervened on.

2.7 Discussion

The increase in Bethany's mean number of spelling words from Baseline to Intervention clearly showed the success of the CCC method. Prior to the intervention the student displayed frustration, non-compliance and severe deficiency when asked to spell words from her spelling list. Initial observation in the classroom showed that the student was receiving little spelling instruction and was instead given a sheet of spelling words and asked to independently copy each word ten times. This method did not promote retention, discrimination, accuracy or many practical spelling strategies. To remediate this, the researchers decided CCC would be an appropriate and effective method to increase the student's spelling accuracy. As predicted, this method was highly effective when given the right conditions. However, the researchers encountered several obstacles toward obtaining these necessary conditions, which at times somewhat hindered the success of the intervention. For example, this intervention requires approximately 30 minutes each session due to the low focus ability of the participant. Due to this and short availability on the part of the researchers, the data collection and intervention method had to be altered. Initially both pre-test and post-test data collection of all 15 spelling words was implemented, but the researchers quickly realized the length of time required was too straining on the participant. Bethany began to lose focus midway through the intervention and in turn did not perform to her potential during the post-test data collection. The researchers spent more time prompting and fixing behaviors than teaching and assessing the student's spelling ability. Once the data collection was altered to reflect the current system, implementation and compliance of the student dramatically increased. This intervention was easy to implement, cost-effective and required little preparation necessary. There were no major supplies to purchase and the researchers easily created the worksheets by simply printing lines on a blank sheet of paper and writing the spelling words on the left column. The rewards used for completion of worksheet and post-test were "dollar tokens" collected and turned in for free time at the end of the day. These were part of the existent token economy system used in Bethany's classroom and were therefore readily available. Although tokens and praise were reinforcing for Bethany, providing greater instantaneous rewards that are unique to those currently available in the classroom could increase her motivation for future studies.

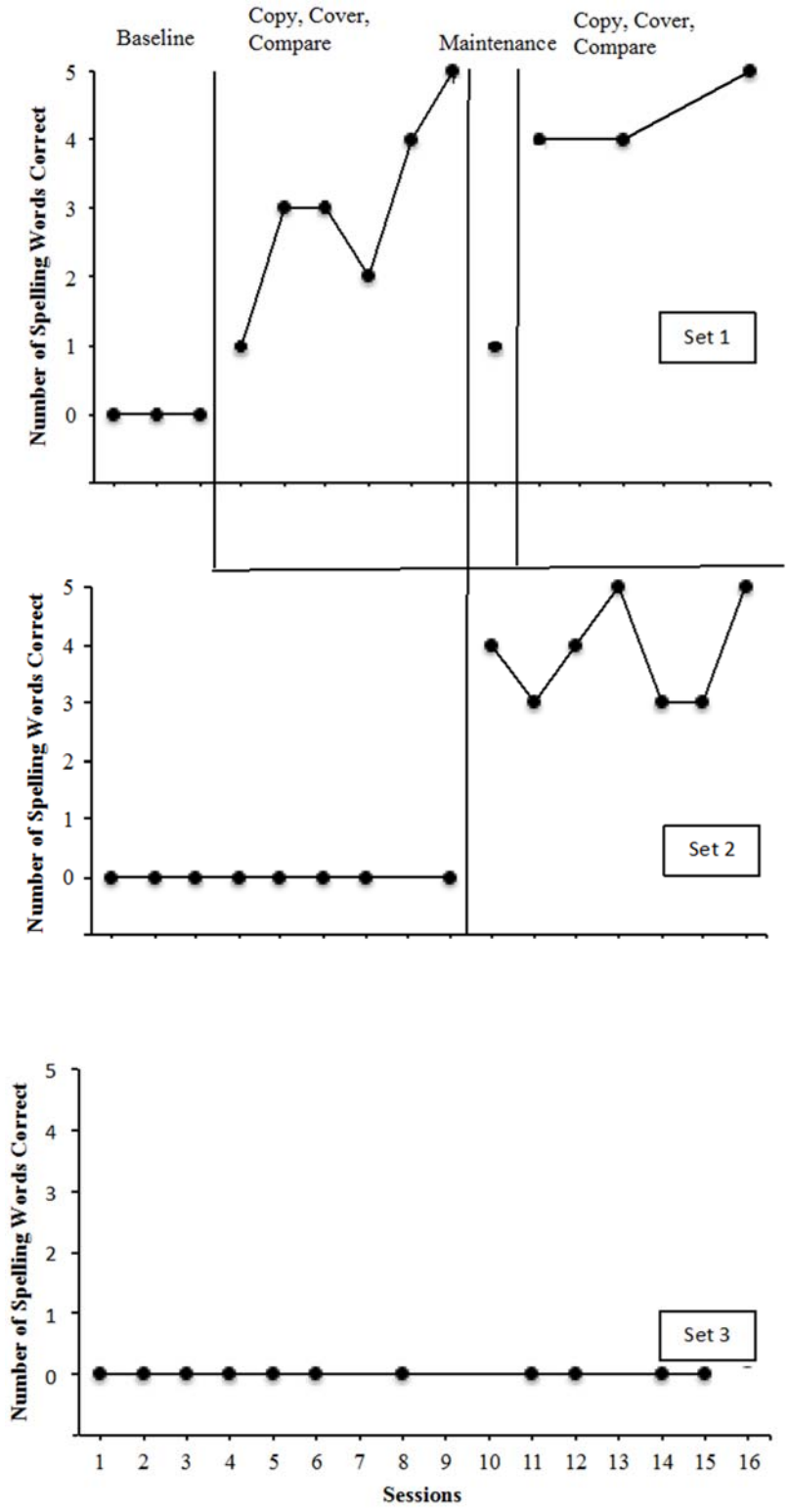

Fig 1: Results of number of correct words spelled per set for baseline and CCC, Maintenance across three sets

3. Author Notes

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