

Using Cover, Copy, and Compare Spelling With and Without Timing for Elementary Students with Behavior Disorders

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Received: December 2011 / Revised: February 2012 / Accepted: March 2012


Abstract

The purpose of this study was to determine the effectiveness of cover, copy, and compare (CCC) procedures on spelling performance with two students. The participants were two elementary students enrolled in a self-contained behavior intervention classroom. A multiple baseline design across participants was employed to evaluate the effects of CCC on time to completion and words spelled correctly. Improvements in all measures were found when CCC was in effect. The participants enjoyed the procedures and each improved their spelling over baseline performance. The applicability of CCC across academic contexts and for students with behavior disorders was discussed.

Keywords: elementary students with severe behavior disorders, spelling, core words, timing, cover, copy, and compare, single case research designs

Introduction

Spelling remains an important skill to teach in the schools (Graham, Harris, Fink-Chorzempa, & Adkins, 2004; McLaughlin, Weber, & Barretto, 2004). As described by Wanzek, Vaughn, Wexler, Swanson, Edmonds, and Kim (2006), spelling requires the learner to match the sounds of language with the appropriate letters in right order to correctly and reliably convey messages in text. Effective spelling can heighten decoding skills and spelling-sound knowledge. Spelling skills can further improve instruction in alphabetic understanding as well as reading (Graham, Harris, & Fink-Chorzempa, 2002). As discussed in Santoro, Coyne,

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and Simmons (2006), the literature suggests that the actual process of spelling involves the critical integration of phonological and alphabetic skills required during reading acquisition.

Several procedures have been found to be effective for improving skills in spelling (McLaughlin et al., 2004). As noted by Wanzek et al. (2006), the use of computer-assisted instruction can produce improved spelling of words in context. Using a computer cannot only increase the motivation of a student, but it allows for direct and personalized instruction, specifically for students with LD. Computer based instruction (CBI) was evaluated by Mayfield, Glenn, and Vollmer (2008) as a method to teach spelling to two 6th graders. A voice recording of each word was presented as a prompt for the students to type the word. CBI training procedure was used for error correction; which consisted of prompt fading, systematic review of errors and practice. Their results indicated a need for several 15-minute training sessions to occur in order for each participant to score 100% for each word set. However data for maintenance phase resulted in an average performance of 93% across all word sets. These overall results helped establish the effectiveness of a computerized spelling program for average learners. Spell checkers are part of most word processing programs. With the use of such features, some may view spelling as no longer an important skill. Unfortunately, spell check programs are not all that accurate in finding and correcting spelling errors in composition (Wissick, 2005).

Class-wide peer tutoring (CWPT) review and practice procedures have been implemented to improve the spelling skills with both students with disabilities and students at-risk for school failure (Swanson & Greenwood, 1996). Karagiannakis (2008) evaluated the use of CWPT with a group of 40 boys, some with behavior problems. She reported that the CWPT procedure had a positive impact, not only with subject matter areas in academics, but also the participants' self-concept, social status, and on-task behavior. Results of this research showed significant academic improvements, as well as gains in social functioning with CWPT.

Cover, copy, and compare (CCC) is a strategy that has been used to improve accuracy and fluency, as well as demonstrating maintenance across students, academic skill domains, and settings (McLaughlin & Skinner, 1996; Skinner, McLaughlin, & Logan 1997). Skinner et al. defined the steps of CCC as: (1) looking at the academic stimulus, (2) covering the stimulus, (3) responding by copying the stimulus, and (4) evaluating the responses by comparing it to the original stimulus. Cates, Dunne, Erkfriz, Kivisto, Lee, and Wierzbicki, (2007) assessed the effects of a CCC procedure and a constant time delay procedure on the acquisition, subsequent maintenance, and adaptation of acquired spelling words to oral reading passages. The results of Cates et al. suggested that the combined use of CCC and time delay was effective; however the CCC procedure resulted in higher levels of maintenance for some of their participants. Cieslar, McLaughlin, and Derby (2008) evaluated the effects of (CCC) procedure to improve both spelling and math performance with a freshman with behavior disorders enrolled in a special education classroom setting. A functional relationship between their procedure and an increase in both mathematics and spelling performance was found. Carter, McLaughlin, Derby, Schuler, and Everman (2011) implemented CCC in a self-contained classroom for high school students with severe behavior disorders. The effects of CCC were evaluated with combination multiple baseline and reversal design. They found that CCC was effective to increase the spelling accuracy of the 240 commonly used words. The return to baseline did not decrease the spelling performance for two of their three remaining participants. The subsequent replication of the CCC procedures maintained high student spelling performance. Stading, Williams, and McLaughlin (1996) evaluated the effects of CCC on the mastery of multiplication facts with a third grade girl with learning disability in a home setting. Their results indicated CCC was successful in improving

multiplication skills in a home setting. Lastly, Skinner, Belfiore, and Pierce (1992) assessed the effect of CCC with behavior disorder students. The results of their research suggested that the CCC procedure was an effective method in increasing the geography accuracy of students with behavior disorders.

The use of timing has been suggested as a way to improve the academic fluency of students. Typically, a teacher or student uses some device to monitor the time required to complete an assignment or task. These data are then entered on a data form or graphed. Van Houten and colleagues (Van Houten, Hill, & Parson, 1975; Van Houten & Thompson, 1976) were able to improve student performance with timing, public posting of results, and feedback. This was accomplished with little additional classroom resources (Van Houten et al., 1975). Other educational researchers have also supported the use of timing to improve student academic performance. Simply informing students their performance will be timed can improve student performance (Van Houten et al., 1975; Rhymer, Dittmer, Skinner, & Jackson, 2000). Finally, timing can improve student performance without the use of feedback, public posting, or consequences (Miller, Hall, & Heward, 1995; Rhymer et al., 2000; Rhymer, Henington, Skinner, & Looby, 1999; Rhymer, Skinner, Henington, D'Reaux, & Sims, 1998; Skinner, Fletcher, & Henington, 1996). Often students with behavior disorders are slow to complete tasks, and maybe addition of some form of timing could increase their time to completion.

The purposes of the present research were three-fold. First, we wanted to extend and replicate the use of CCC to elementary students with severe behavior disorders. Second, we wanted to increase the accuracy of our participants to spell words thought to be important for each grade level in the school district in which they were enrolled. Third, we wanted to examine the effects of timing on an academic task. We did so by measured by time to complete the spelling task with one of our participants.

Method

Participants and Setting

The master teacher and the first author selected the two participants. They were chosen because of their spelling errors on written assignments. Participant 1 had been enrolled in special education since preschool. He was a 6th grader at the time of the study and had been placed in a behavior instruction special education classroom since 1st grade. This participant had an IEP for all academic areas, for behavior, and for speech. He had been diagnosed with having apraxia and received 1 hour of speech per week at school and also 1 hour per week outside of school. Based on the *Woodcock Johnson Tests of Achievement (WJ III)* (Woodcock, McGrew, & Mather, 2008). Participant 1 read at approximately a 1st grade 8-month level. He was in the process of mainstreaming into his regular education class at the time of the study.

Participant 2 had an IEP goal for behavior and also for the academic area of writing. He was in the 3rd grade at the time of the study and had been in the behavior intervention special education classroom for 3 years. Based on standardized testing (Woodcock et al., 2008), Participant 2 read at approximately a 2nd grade 6-month level. While Participant 2 needed additional instruction with spelling and he also is a slow worker. The first author and classroom staff wanted to decrease the amount of time it took him to complete his spelling tasks. It was also a goal to have this reduction in time to completion generalize to taking less time to independently complete his the CCC sheet.

Both participants in this study were enrolled in the same self-contained special education classroom. This elementary school was located in a low-socioeconomic area in a large urban city in the Pacific Northwest. There was an average of 10 students enrolled in the classroom.

The academic performance of the class ranged from the 2nd to 6th grade level in reading, math, and written communication. Most students left the classroom at various times during the day to attend other classes such as band, PE, and library. There were two certified teachers in the classroom and three qualified instructional aides as well as the first author. She was a full-time student teacher in the classroom at the time of the study. Instructional formats included individual time, small group, and whole group. The first author worked with the participants at various times during the school day. Participant 1, whom had mainstreamed into his regular education classroom, was typically taught spelling in the afternoons on Tuesdays and Thursdays. Participant 2 was taught spelling prior to or toward the end of reading time, which occurred in the morning just before lunch. Spelling sessions lasted anywhere from 15 to 40 minutes. Other students as well as two or three adults were present in the room when data collection took place.

Materials

A variety of materials were utilized during the study. These included two pieces of blank lined paper for the pre-test and post-test, a CCC table on a sheet of printer paper, a list of core words each for grades 1 and 3, a timer for measuring time to completion, and preferred rewards such as candy, chips, or a granola bar.

Dependent Variables and Measurement

The dependent variable measured in this study was the number of words spelled correct on pre- and posttests. For Participant 2, an additional dependent variable was measured, that of time to completion. This was defined as the time it took to complete his spelling tasks. The participant was timed during the pre-test and if he decreased his time during the posttest, he would earn a reward. His reward was a piece of candy from a bag. All sessions were scored using a list of all the words. Corrects were marked with a + sign in the column next the word if they correctly spelled that word, a – sign was used to indicate a word had been misspelled. The date for each column of data points was written at the top of the end column.

Experimental Design and Procedure

A single case multiple baseline design across participants (Kazdin, 2010) was used to evaluate the effectiveness of the CCC procedure on spelling core words.

Baseline. During baseline, each participant was administered a spelling test using 10 core words taken from the grade level core word list appropriate for that student based on his current level determined by standardized achievement scores. Baseline data were taken for three days for Participant 1, and two days for Participant 2. During these sessions, each participant was given a piece of lined paper with the numbers 1 through 10 printed in the left margin. The researcher orally administered each participant his 10 words chosen of the core word list. No feedback was provided to the participants during baseline. Beginning at Session 6, the time to completion baseline for Participant 2 was taken.

CCC. After baseline, the CCC procedure was implemented. During the first session, each participant was given a pretest using the same words given during the baseline sessions. Beginning on Session 6, Participant 2 was timed during the pretest and told if he decreased his time to complete his the posttest, he would earn an award. After the pretest the participant was provided with a CCC worksheet. The student read the first word in the first column; next they copied the word into the next column. After the participant copied the word it was covered using a blank sheet of paper. Next, each participant wrote this word from memory in the CCC column. Once they finished writing the word, the blank sheet of paper was removed and the participant compared the spelling of the word they wrote from

memory to the word given in the first column. If they misspelled the word, they were required to write the correct spelling in the final column provided. After this error correction procedure, they moved to the next word. This condition was in effect for 11 to 17 sessions.

Interobserver Agreement

Interobserver agreement was collected using a blank data-scoring sheet that was identical to the primary data sheet. Either the master teacher or an instructional aide was given the spelling tests to be checked. The same scoring procedure using the + or – signs was employed. These spelling tests scores were masked. This allowed the scoring to be independent each time reliability of measurement was taken. Reliability was taken for 50% of the total amount of sessions performed with Participant 1 and for 53% of the total amount of sessions performed with Participant 2. The agreement quotient was computed by dividing the number of agreements by the number agreements plus disagreements multiplied by 100. The mean agreement was 96% for Participant 1 with a range of 90 to 100%. The mean agreement for participant 2 was 96% with a range of 70 to 100%. Two adults in the classroom independently but simultaneously recorded the amount of time required for Participant 2 to complete his posttest. The smaller number of seconds was divided by the larger and multiplied by 100. Overall agreement for time to completion ranged from 98 to 100% with an overall mean of 99%.

Results

Participant 1

Accuracy in baseline for Participant 1 was low ($M = 15\%$; range 10 to 20%). With the implementation of the CCC procedure, Participant 1 increased his performance by correctly spelling seven words on his first posttest.

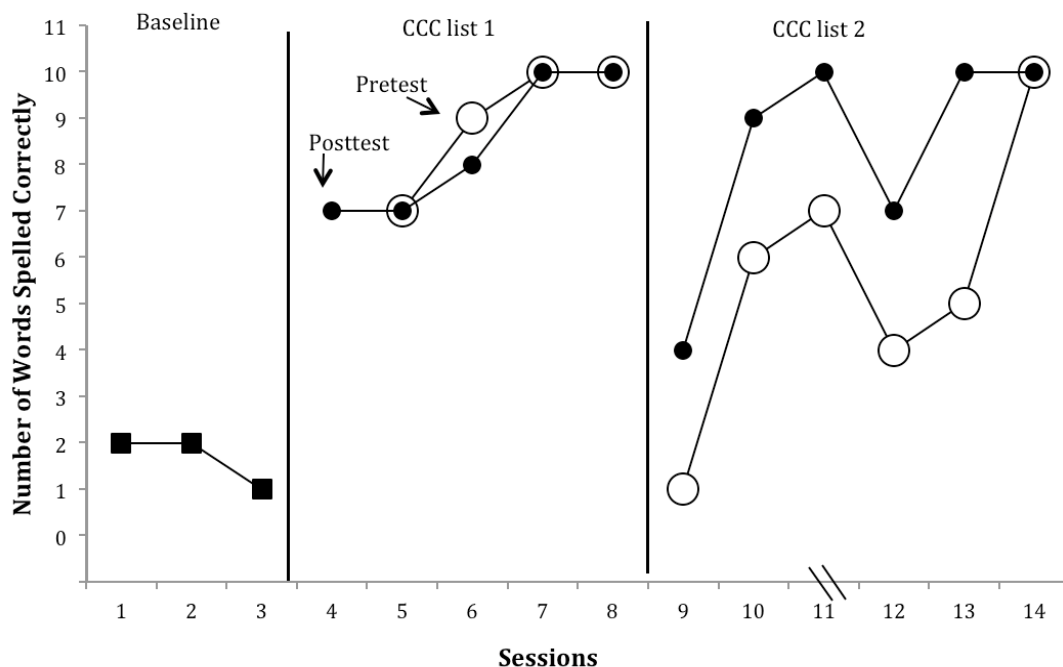


Figure 1. The number of words spelled correctly during, baseline, cover, copy, and compare for Participant 1. Open circles are weekly pretest scores and closed circles are posttest scores.

The last baseline data was used as a pretest prior to the CCC procedure being implemented. Therefore the first data point during the CCC procedure was used as a posttest score. Participant 1 continued to increase the number of words he spelled correctly. Once the participant had correctly spelled all 10 of the words for two consecutive posttests, a new list from his core word list was created. When List two was first introduced (Session 9), his number of correct words decreased to near baseline levels. However, after the CCC procedure he steadily increased his performance. Between Sessions 11 and 12 there was a no instruction for approximately 15 days. Due to this loss of instructional time, our participants performed at lower levels than they had prior to the break. After the first session of CCC following the break, the participant steadily increased his amount of words spelled correctly and within a couple sessions had mastered the second word list. Due to the student correctly spelling all 10 words on two consecutive posttests, the researcher finished data collection for Participant 1.

Participant 2

In baseline the mean percent correct was low ($M = 25$; range 20 to 30%). When the CCC

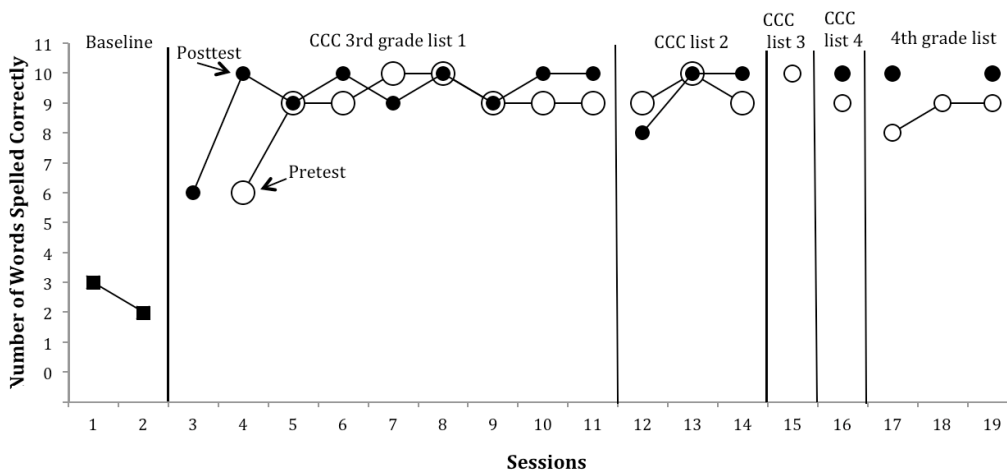


Figure 2. The number of words spelled correctly during, baseline, cover, copy, and compare with Participant 2. Open circles are weekly pretest scores and closed circles are posttest scores.

was implemented, the number of correctly spelled words increased. Again, the first data point during the CCC procedure was taken as a posttest since his last baseline point was used for the pretest. After the first CCC session, the participant had doubled the number of words spelled correctly. During session 4 the participant had scored the same on his pretest as he had done on the last posttest but after the CCC procedure he was able to spell all 10 words correctly. For the remainder of the sessions, Participant 2 continued to spell 80 to 100% of the words correctly. Overall his data was stable but it was not until the 10th and 11th sessions that he scored a 10 consecutively on the posttests. After this, the researcher constructed a second list to use with the same core word list. The participant scored a 9 on the pretest and an 8 on the posttest with this new list of words. This list was only used for two more sessions due to the participant correctly spelling all the words on both posttests. A third list was then constructed from the same core word list. The participant correctly spelled all 10 words on the pretest; therefore the researcher did not implement that CCC procedure or give the posttest for this list. A fourth list was then developed with all new words from the core word list. The participant correctly spelled 9 words on the pretest and 10 words on his posttest. Because the participant’s performance with these core words, it was decided to use core word list for the next grade level. The final list used was comprised

using the 4th grade core word list. The participant correctly spelled 8 words on the pretest with this list and 10 on the posttest. Two more sessions were conducted using this list of words. Our participant had mastered this list in just two sessions. Data collection ended for Participant 2 when the first author's student teaching was completed.

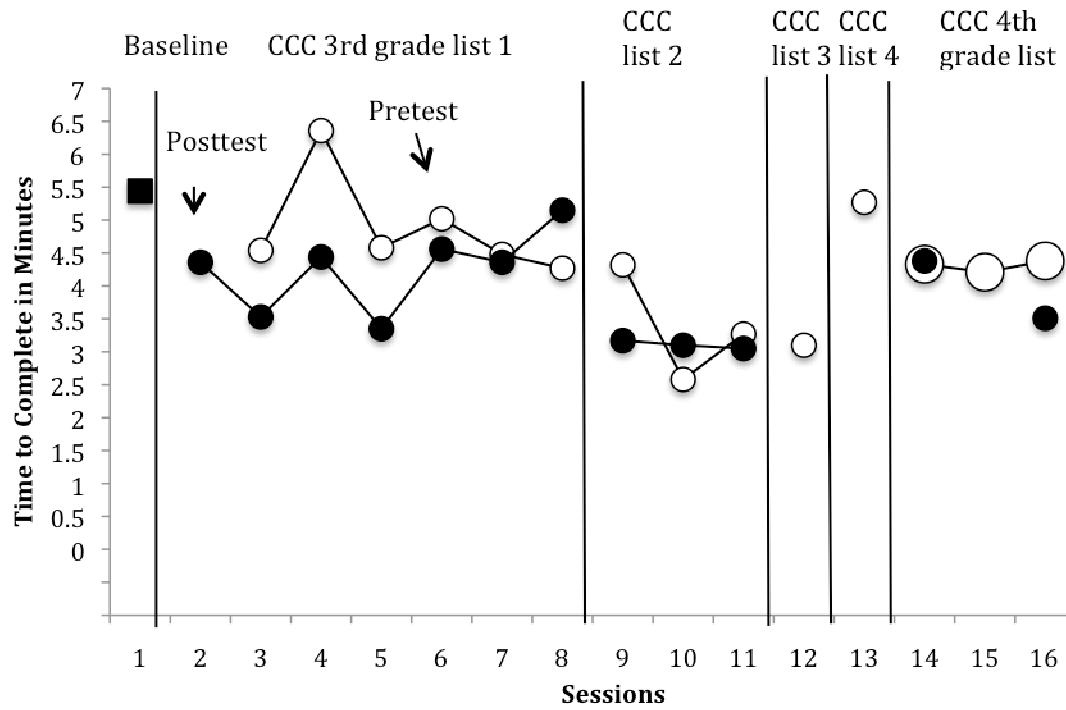


Figure 3. The amount of time in minutes (speed) required for Participant 2 to complete his pre- and post-testing.

For Participant 2, time to completion was assessed beginning on Session 6. A decrease in total amount of time it took to complete his posttest was found. However, his pretest only slightly increased from that recorded in baseline, which was less than 6 minutes. The average time spent on his pretests was 4 minutes and 41 seconds. The average time spent on his posttests was approximately 3.91 minutes. His time to completion for his pretests remained stable, while his posttest timings showed a decreasing trend.

Discussion

The overall results of this study indicated that using the CCC procedure for spelling improved the accuracy of spelling for two students placed in a behavior instruction classroom. Their performance steadily improved with use of CCC. The present outcomes replicate previous research using CCC for students with behavior disorders (Cater et al., 2011; Cieslar et al., 2008; Skinner et al., 1994) and that reported with students with other disabilities (Cates et al., 2007; Murphy et al., 1994). In the present investigation, the researcher was able to effectively employ CCC in an elementary special education classroom for students with severe behavior disorders.

Although the participants were both successful in using the CCC, their performance varied widely. It can be assumed that Participant 1 had less stable data because of the amount of time he spent in the general education classroom. Participant 1 spent less time working with the first author and had a considerable length of time where he was unable to practice his spelling words because he was not in the special education classroom. Participant 1 appeared to be affected by his apraxia. This made it much more difficult for him to sound

out his words as he was trying to spell them. Knowing this, the first author spent considerably more amount of time in spelling with Participant 1 than Participant 2. Even when the first author spent more time with him, his apraxia still affected his outcomes.

Participant 2 successfully increased the number of words he spelled correctly, but did not make large gains in decreasing the time he took him to complete his tests. While the reward was a motivation for the participant, he also had to be reminded when taking his tests that he was wasting time with such behaviors as erasing letters to make them more eligible, or repeating the word over to himself out loud instead of writing the word at the same time. Participant 2 seemed to have difficulty verbally spelling the word as he wrote it. Often, he would say the correct letter, but write a different letter. He would have to erase his error and begin to spell the word again. Participant 2 completed 19 sessions and was able to master four lists of words from the 3rd grade core word list and 1 list from the 4th grade core word list. These results suggest the CCC procedure was effective in improving the spelling for this student.

There were limitations in present investigation. These included, the amount of time available to work with Participant 1. Since he was being mainstreamed out of the behavior intervention classroom, the first author had less available time to work with him. Using a participant from the classroom that remained full time in the self-contained classroom would have avoided any long breaks in between sessions. For Participant 2, the study helped to increase his spelling skills, but the sessions often took away time from his reading instruction. While Participant 2 was in the classroom for a considerable amount of the day, due to his slow working habits, the first author had to determine times when she would be able to work for a longer periods of time with him. Another possible limitation was the amount of time preparing and scoring both the tests and each of the participant's CCC sheet. Since the participants had anywhere from 2-5 lists of words throughout the study, it required the researcher writing in the words on the CCC sheet and also developing several data sheets for both primary and reliability data collection. One way to improve the time spent on preparation would be to develop several lists of words prior to beginning the CCC procedure. When a participant mastered one list, the next list would already be generated and available for implementation and use.

The cost of this study was minimal due to the fact most of the materials were already available in the classroom. The first author only had to provide the preferred item as rewards for Participant 2. The cost of the reward was quite low when one considers its effects on his performance. Both participants appeared to enjoy the procedures and did present in any behavioral issues during them. They each enjoyed sharing their success with their classroom teachers. Participant 2 even asked to be able to take home his results to show his mother how well he was improving in his spelling skills.

The implications of the present research are several. First, a classroom teacher can implement CCC in their classroom. Second, data collection and analysis can occur within a typical teaching environment. As we accomplished for Participant 2, we were able to add an additional contingency and evaluate its effects during ongoing our classroom research. Third, it appears that CCC should be considered as an intervention that can be an easily implemented self-tutoring or self-management strategy in either a special education or general education classroom setting. Finally, CCC was again shown to be an effective academic intervention in an elementary classroom. This replicates much of our classroom research (Carter et al., 2011; Cieslar et al., 2010; Membrey McLaughlin, Derby, & Antcliff, 2011; Murphy et al., 1990; Skarr, McLaughlin, Derby, Meade, & Williams, in press; Stading et al., 1996) and that of other researchers (Cates et al., 2009; Skinner et al., 1992, 1996).

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