

The Effects of Direct Instruction Flashcards and Copy, Cover, Compare on Sight Word Skills of Two Elementary Students in a Parochial School Setting: A Replication

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Abstract: The purpose of this study was to implement and analyze Direct Instruction (DI) flashcards and Copy, Cover, Compare (CCC) systems to teach sight word identification to two 2nd grade students who qualified for Washington state reading assistance programs. A multiple baseline design was used across word sets with each student to evaluate the effectiveness of the respective procedures. A functional relationship was demonstrated between the use of either strategy for increasing the reading of sight words. The outcomes possibly indicated that DI flashcards were a bit more effective way to teach sight words to low-level readers as compared to CCC. However, this effect was small. Suggestions for future research using DI flashcards or CCC were made.

Keywords: Direct Instruction (DI) flashcards, Copy, Cover, and Compare (CCC), Sight Words, Private School Students, Elementary School Students, ABABAB Single Case Design, ACACACAC Single Case Design, Parochial School

Introduction

Reading is a fundamental skill needed in order for students to succeed in school and life after secondary education (Cunningham & Stanovich, 2001). One of the most important factors of reading is sight word reading, or “the ability to read individual words accurately and quickly in isolation as well as in text,” (p. 9). This is a skill taught after basic decoding and blending mastery that improves both literacy and comprehension through fluency, or the speed and accuracy of reading. Being able to read words from memory by sight allows readers to focus their attention on constructing the meaning of the text while their eyes recognize individual words automatically (Ehri, 2004). When a student does not have this ability, he or she may struggle over basic decoding or blending, which slows down the reading process and overall

literacy (). It is proven that literacy is necessary for future academic and life skills, such as automatic, general language skills (i.e. vocabulary) and syntax skills (Cunningham & Stanovich 2001). Therefore, knowing sight words are a fundamental building block for literacy, it is a vital skill to learn during early development (Carnine, Silbert, & Kameenui, 1997; Carnine, Silbert, Kameenui, & Tarver, 2010).

Copy, cover, compare or cover, copy, compare (CCC) is a set of strategies that have been widely employed in classroom research in spelling and math (Konrad & Joseph, 2014; Joseph, Konrad, Cates, Vajcner, Eveleigh, & Fisheye, 2012). CCC is a student managed self-tutoring procedure that encourages the development of literacy and self-correction skills via repeated presentation of specific information and immediate feedback for the student (McLaughlin & Skinner, 1996; Skinner, McLaughlin, & Logan, 1997). This strategy is efficient and effective, easy to implement, reasonable cost, and enjoyable for both the student and the facilitator as it implements opportunities to engage more one-on-one learning time (Harvey, Connor-Boyle, McLaughlin, Weber, Derby, & Sanders, 2015). With this procedure, students are given a list with four columns and answers in the first column so that they can then look at the item in the first column and say the answer. The students then cover the first and second columns as they attempt to correctly write the same word in the third column. The fourth column is used to check whether or not the three columns are the same. If there is an error, they write the problem and correct solution or correct spelling of a term three times. The first author used a variation of this procedure in this study. However, the main focus of this CCC procedure was to teach the reading of sight words, as opposed to traditional skills this strategy is used for, such as spelling. CCC has been implemented in elementary school special and general education settings (Kaufman, McLaughlin, Derby, & Waco, 2011; Konrad & Joseph, 2014; Rivera, Heric, Williams, McLaughlin, & Johnson, 2014; Weber, McLaughlin, Cozza, & Millersmith, 2013), middle school (Doll, McLaughlin, Neyman, & Schuler, 2013; Hollingsworth, Keith, McLaughlin, & Derby, 2011; Hochstetler, McLaughlin, Derby, & Kinney, 2013) as well as high school (Carter, McLaughlin, Derby, Schuler, & Everman, 2011; Zielinski, McLaughlin, & Derby, 2012).

Direct Instruction (DI) flashcards (DI flashcards) is an explicit flashcard system designed for one-on-one tutoring situations (Silbert, Carnine, & Stein, 1981). The flashcard system was developed by Carnine and colleagues to teach students their basic math facts (Glover, McLaughlin, Derby, & Gower, 2010). However, DI flashcards have been implemented and evaluated to teach sight words (Crowley, McLaughlin, & Kahn, 2013; Green, McLaughlin, Derby, & Lee, 2010) as well as colors, shapes, and letter/sound identification (Bechtoldt, McLaughlin, Derby, & Blecher, 2014; Herberg, McLaughlin, Derby, & Higgins, McLaughlin, Derby, & Long, 2012; Higgins, McLaughlin, Derby, & Long, 2012; Mangundayo, McLaughlin, Williams, & Toone, 2013).

Initially, a pretest over the chosen area of improvement, such as math facts or sight words is given. The student is either allowed to say or write the problem or its answer within two or three

seconds. This pretest is employed to determine which facts or sight words the student knows or does not know. The participant is then intensively taught both known and the unknown facts or sight words using DI flashcards. These flashcards are typically placed in sets or groups of 15 flashcards (Skarr, Zielinski, Ruwe, Sharp, Williams, & McLaughlin, 2014). However, any number of flashcards constructed may vary depending on the age and skill set of the student (DeLong, McLaughlin, Neyman, & Wolf, 2014). When the student makes an error, the teacher models the answer for the student. Then the student and teacher answer the flashcard correctly. Finally, the student is presented the error flashcard again. To move to the next word in the stack, the student must independently say the sight word correctly. If the student makes an error, this correction procedure is completed again. After the student correctly answers this sight word flashcard, it is placed two or three cards back until the student correctly responds independently again for three times. This explicit error correction procedure allows constant exposure to and practice with sight words that were missed on the pretest or during instruction.

Like CCC, DI flashcards have been implemented a wide range of classroom environments. These have included preschool classrooms (Ehlers, McLaughlin, Derby, & Rinaldi, 2009; Mangundayo et al., 2013), elementary general and special education settings (Crowley et al., 2013; Falk, Band, & McLaughlin, 2003; McGrath, McLaughlin, Derby, & Bucknell, 2012; Printz, McLaughlin, & Band, 2006; Romjue, McLaughlin, & Derby, 2011; Skarr et al., 2014; Thompson-Olmstead, McLaughlin, Neyman, & Urlacher, 2015), middle school or high school special education classrooms (Brasch, Williams, & McLaughlin, 2008; Fox-Lopp, McLaughlin, Weber, & Hatch, 2014; Lebrun, Jones, Neyman, McLaughlin, & Schuler, 2014; Ruwe, McLaughlin, Derby, & Johnson, 2011). We have been able to implement DI flashcards in classrooms with very young children in birth to three programs (Herberg, McLaughlin, Derby, & Gilbert, 2011; Thomas, McLaughlin, & Derby, 2015). This has not been the case with CCC, because with CCC very young children must be able to write their answers as well as write correctly the words missed to engage in error correction. The importance being able to replicate cannot be overstated (Barlow, Knock, & Hersen, 2008; Kazdin, 2011; Sidman, 1988). Repeating experiments and finding the same outcomes adds power and strength to one's outcomes as well as the procedure to program being evaluated. Single case research places a special importance on within as well as between participants (Barlow, Nock, & Hersen, 2008). The purpose of this study was to replicate and extend the work of Rivera et al. (2014) and to provide another demonstration of the efficacy of either CCC or DI flashcards with elementary school children enrolled in general education classrooms in a private parochial school. A replication as to the efficacy of these two academic techniques, provides one with additional confidence that such procedures should be employed in a teacher's classroom. Finally, replications provide the building blocks for the use of powerful and effective intervention procedures (Jasny, Chin, Chong, & Vignieri, 2011; Johnson & Pennypacker, 2009; Kazdin, 2011; McLaughlin, 1983).

Method

Participants and Setting

This study was conducted with two participants. Participant 1, “Patrick”, was an eight-year-old boy enrolled in the second grade classroom. He was a mild-mannered, well-behaved student who displayed reading difficulties and was slightly below his average classmates’ reading levels. Testing showed that he could read at about a beginning second grade level, when this research was conducted over halfway through the school year. He received outside reading help from a public school reading specialist that involved 30-minute pull-out sessions once every school day. Participant 2 was “Carmine”, an eight-year-old boy in the same second grade classroom as Patrick. Carmine presented more severe reading limitations. He also received outside assistance from a public school specialist through 30-minute pull-out sessions once each school day. Because both Patrick and Carmine were falling behind in reading, the classroom teacher felt they were not able to reach their full potential in other areas of school that required reading, such as science literature or math directions and word problems. The students’ teacher felt that because of their reading difficulties, Carmine and Patrick would be suitable participants for this study.

The setting for this study was a general education second grade classroom located in a low-income urban parochial school located in a large urban city in the Pacific Northwest. There were 23 students and one teacher in the classroom. The study took place in the morning twice a week and each session was conducted with the first author. This parochial school has been employed in other action research projects (Altharwa, Neyman, McLaughlin, & Johnson, 2014; Rivera, Heric, Williams, McLaughlin, & Johnson, 2015). This school has been also been of an endorsement or certification program between the State of Washington and the local private university (McLaughlin, B. Williams, R. Williams, Peck, Derby, Weber, & Bjordahl, 1999).

Materials

For the DI flashcard intervention, notecards with printed target words were the only materials needed. For the CCC intervention, a pencil and paper with target words written along the left-hand side were used. No other materials were needed.

Dependent Variables and Measurement Procedures

The dependent variable was number of sight words read correctly. A correct word was defined such if the student vocalized the correct pronunciation of the word presented on a note card or word list within three seconds. The first author used words from Dolch second grade reading lists. For Participant 1, the words were presented in three sets of 15 words on individual notecards. For Participant 2, on the other hand, words were presented in three set lists of 15 words on sheets of notebook paper. The participants had to say these words aloud accurately

throughout the course of the study. These data were collected from a pre and posttest. In addition, we gathered data for each individual session with our participants.

The second measure was the percent of non-overlapping data points between baseline and each subsequent intervention (either DI flashcards or CCC). The number of non-overlapping data points for each baseline data point were compared to each intervention data point by experimental condition (Scruggs & Mastropieri, 2013; Scruggs, Mastropieri & Casto, 1987). This then would yield the number of non-overlapping data points by the number possible. The number of overlapping data points were determined by dividing the number possible by the number of data points that were overlapping.

Experimental Design and Conditions

An ABABAB and ACACACAC single case research design (Kazdin, 2011) was employed. The determination of which intervention was employed with which student was done at random. A description of the various experimental manipulations follows.

Baseline (A). The baseline involved showing the students 15 second-grade Dolch sight words, which the students were instructed to read each word. The first author told the students to attempt to read each word, even if they did not know the word. Baseline for CCC was in effect three times for a total of nine sessions. Baseline for DI flashcards was in effect four times for a total of 12 sessions. On some school days, more than one session was carried out. The participants did not receive feedback on the number correct or incorrect responses during each baseline.

DI flashcards (B). DI flashcard techniques were used to present the DI flashcard and CCC systems, with each word presented in a model, lead, test format (Carnine, Silbert, & Kameenui, 1997). In the DI flashcard system, Participant 1 was shown one card at a time and had 3 seconds to respond. If the response was correct, the card was put in the back of the pile. If there was an error, the first author said the correct word, asked "What word?" and then moved the card back two or three cards to be later repeated. This process continued until the participant correctly read the word. This condition was in effect four separate times for a total of 13 sessions.

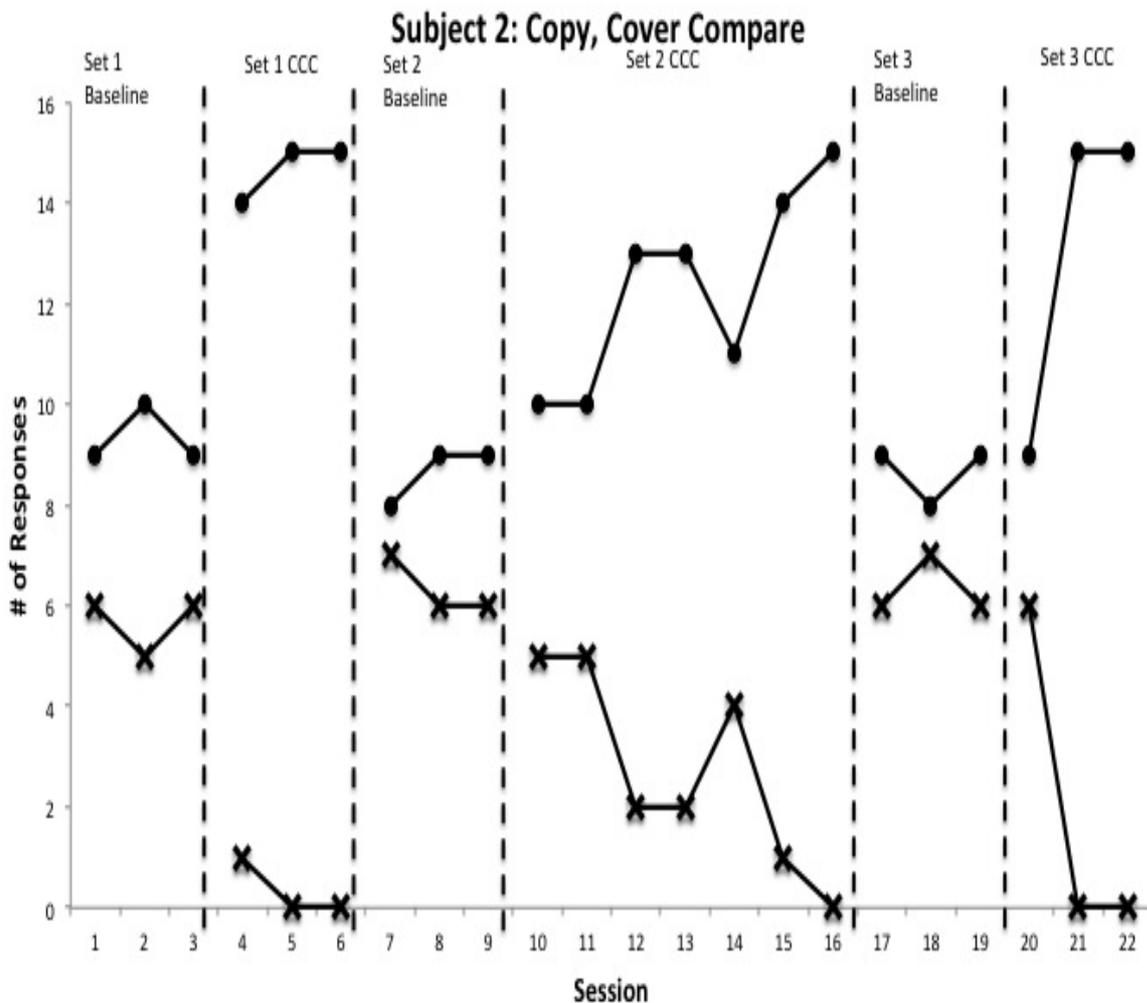
CCC (C). In the CCC system, Participant 2 was provided a list of sight words on a sheet of paper with three columns and the words in the left-most column. The participant was then instructed to read the words in order. If the participant correctly read the word within 3 seconds, he moved on to the next word. If there was an error, the teacher modeled the correct word, said "What word?" and had the student employ the modified copy and cover procedure. This procedure included copying the misread word in the second column, covering the first two columns and then writing the word from memory. After completing CCC, the first author asked "What word?" and waited for the correct response from the participant. Once the participant completed the word list, he read through the list an additional time for practice.

Reliability

Reliability of measurement for sight words was gathered on two different sessions for each participant. These data were gathered in baseline as well as DI flashcards or CCC. An agreement was scored if the first author and reliability observer scored the sight word in the same manner. Any deviation from this was scored as a disagreement. Reliability of measurement was calculated by dividing the number of agreements by agreements and disagreements and multiplying by 100. The reliability of measurement for sight words was 100%.

Results

Figure 1: Number of correct responses for Participant 1 during baselines 1-3 and DI flashcards 1-3.



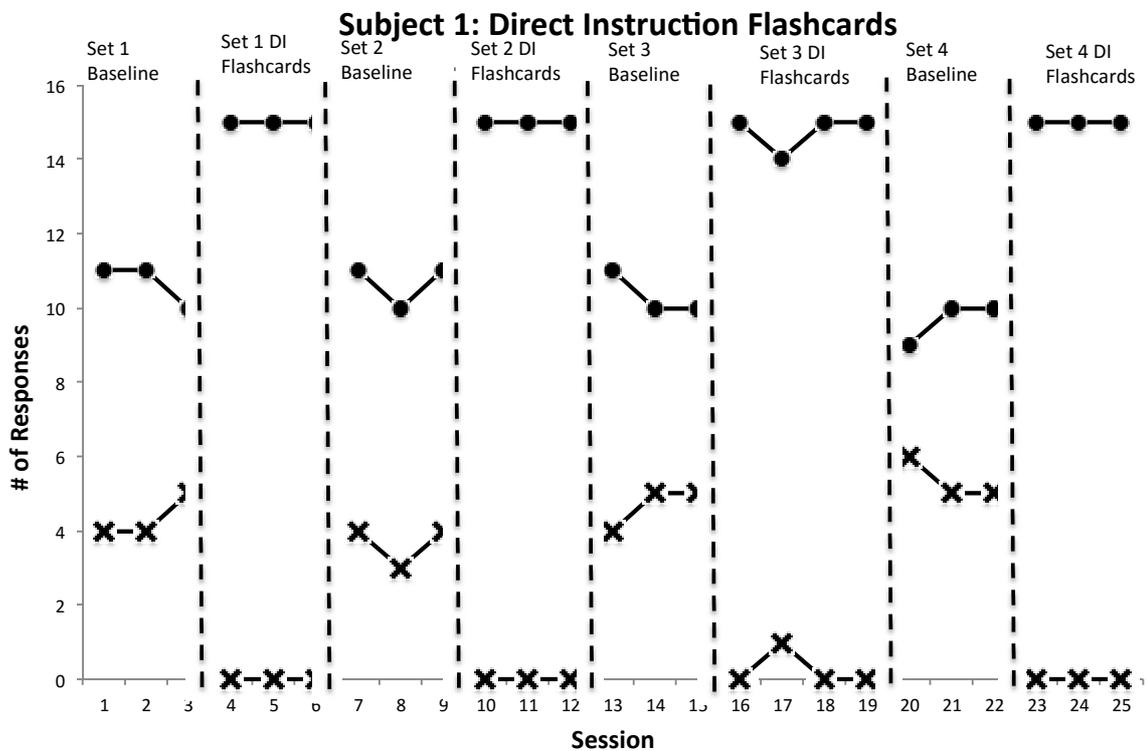


Figure 2: Number correct for three baselines and three applications of CCC for Participant 2.

Results

Pre and Posttest Scores

Overall results of the study showed a dramatic increase in the number of sight words each student could read. During the pretest, both participants read 105 out of 150 (70%) words correct. After 23 sessions of DI flashcards on four sets of sight words, Participant 1 was able to read 145 out of 150 words correct, showing a 27% increase. After 23 sessions of CCC intervention with three sets of sight words, Participant 2 was able to read 138 out of 150 words correct. This was a 22% increase from the pretest.

Individual Session Data for DI Flashcards or CCC

Baseline data for Participant 1 prior to DI Flashcard intervention had an average score of 11.25 correct responses and 4.67 errors over the course of four sets of second grade sight words. The participant responded correctly at a range of 9-11, and at 4-6 errors. After intervention, the

participant improved his performance to an average of 14.92 corrects and .08 errors with a range of 14-15 correct responses and 0-1 sight word errors.

Baseline data for Participant 2 prior to CCC intervention revealed an average score of 8.89 correct responses and 6.11 errors over the course of three sets of sight words. The participant responded correctly at a range of 8-10, and at 5-7 errors. After CCC intervention, the participant responded, on average, 13.14 correct and 1.86 errors, at a range of 9-15 correct and 0-6 errors.

Non Overlapping Data Points (NDP)

The percent of non-overlapping data points between baseline and DI flashcards are well as baseline for Participant 2 and CCC were determined. For Participant 1 there were no overlapping data points between corrects or errors for baseline or DI flashcards. This would indicate the DI flashcards were a highly effective intervention for Participant 1 for both corrects and errors for sight words.

For CCC, the percentage of non-overlapping data points was 100 percent until the last implementation of CCC. In that phase the percent of non-overlapping data points was 67% with CCC for both corrects and errors. This last comparison would show CC to be questionable. However, if one compares all the baseline phases to all the CCC phases for Participant 2, then the percentage increases to 92%, which would make CCC very effective (Scruggs & Mastropieri, 2013; Scruggs et al., 1987).

Discussion

Data indicated that CCC and DI flashcard interventions were effective for our participants for learning to read sight words.. The majority of sessions when either intervention was in effect, our participants' correct responses increased and their errors declined. In addition to an overall improvement in posttest scores compared to pretest scores. However, DI flashcards produced a higher average outcome than the CCC procedure. With both participants scoring the same on pretests, Participant 1 showed the most progress in response to DI Flashcards. Therefore, DI Flashcards is a more effective procedure than CCC, most likely due to the constant immediate exposure to each word and fast pace. While CCC employed a writing aspect that might have increased retention, it was a much slower and less demanding procedure than DI Flashcards.

In addition to success in results, both participants enjoyed the interventions and were very motivated to learn. The participants enjoyed seeing their personal improvement, as well as the reinforcement provided by the first author. This might provide some social validity (Wolf, 1978) to our findings. In our previous research (Brasch, Williams, & McLaughlin, 2008; Erbey et al., 2011; Fjortoft, McLaughlin, Derby, Everson, & Johnson, .2014; Hayter et al., 2007; Lund et al., 2010; Skarr, Zielinski, Ruwe, Sharp, Williams, & McLaughlin, 2014) has also indicated that their participants enjoyed being taught using DI flashcards. We have also found this to be the

case when we have employed CCC (Cravalho, et al., 2014; Doll, McLaughlin, Neyman, & Schuler, 2013; Harvey et al., 2015; Hochstetler, McLaughlin, Derby, & Kinney, 2013; Kaufman, McLaughlin, Derby, & Waco, 2011; Skarr et al., 2012; Zielinski, McLaughlin, & Derby, 2012). Our earlier comparisons of DI flashcards and CCC (Kaufman et al., 2011; Skarr et al., 2012; have also indicated that either or both were enjoyed by the students.

One weakness of this study was that it was applied to only two participants, as opposed to a group or larger sample of participants. The first author was also limited by time in the study. The original plan of research was to counterbalance the two interventions (Kazdin, 2011) for each student after three or four sessions to examine the possible change in results, but the first author's semester ended before this could occur. We would urge such a comparison as it eliminates order effects as well as selection bias.

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