

THE EFFECTS OF DIRECT INSTRUCTION FLASHCARDS ON SHAPE RECOGNITION AND RECALL FOR TWO PRESCHOOL STUDENTS WITH DISABILITIES¹

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ABSTRACT

The purpose of this study was to evaluate the effectiveness of a Direct Instruction flashcard system to increase shape identification. The participants were two children who are attending a self-contained special education preschool. Both of the participants are qualified as developmentally delayed across academic areas. A multiple baseline design across six different common shapes was used to evaluate the effects the flashcard system for one participant and the effects of the flashcard system alone was used for the other participant. Results found that the flashcard system was effective in improving term recognition and recall for the one student. However, the flashcard system alone had a small positive effect for improving term recognition. This study was practical, low cost, and an easy to implement procedure can improve recognition and recall for preschool students with developmental delays.

Keywords: DI flashcards, labeling, color and shape identification, preschool students, multiple baseline design.

INTRODUCTION

Shapes are seen everyday in our world and are an important skill for children to acquire. This is because shapes are integrated into safety and informational purposes all around us. Some examples that are important are a crosswalk, stop, and bus stop sign. Teaching shapes can be difficult with children who are label as developmentally delayed. There are several ways that a child can be taught these shapes. There is an increasing population of students who appear to require a more structured and systematic approach when learning many skills (Katz-Sulgrove, McLaughlin, & Peck, 2002; Marchand-Martella, Slocum, & Martella, 2004; National Reading Panel, 2000).

Direct instruction (DI) flashcards have been suggested as a data-based instructional strategy to teach a wide range of basic math facts. The first description of the DI flashcard procedure can be found in Silbert, Carnine, and Stein, (1981). This flashcard procedure consists of the teacher presenting flashcards and providing the student with immediate feedback. The flashcards are presented to the participant, and several seconds are allowed for the participant to respond. Rewards and feedback are provided to improve and maintain performance.. When a student makes an error, the teacher corrects the student through the use of a model, lead, and test format (Marchand-Martella, Slocum, & Martella, 2004; Ruwe, McLaughlin, Derby, & Johnson, 2011). The error card is then placed back two or three

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cards so the student will be provided extra practice to reduce errors (Hopewell, McLaughlin, & Derby, 2011; Kaufman, McLaughlin, Derby, & Waco, 2011; Silbert et al., 1981). DI flashcards have also been used to master many concepts and discrete items in the curricula such as math facts (Glover et al., 2010; Sante, McLaughlin, Weber, & Gower, 2008; Winett & Winkler, 1972) or sight words (Ruwe et al., 2011). Flashcards can also be easily adapted for a variety of academic areas (Erbey, McLaughlin, Derby, & Everson, 2011; Glover, McLaughlin, Derby, & Gower, 2010).

One purpose of this study was to evaluate the effectiveness of a flashcard and reading racetrack procedure to improve recall and recognition of common shapes. A second purpose was to replicate our previous research with younger students. The final purpose was to employ a different measure (saying shapes or colors) than we have in previous research.

METHOD

Participants and Setting

The participants of this study were two preschool children with disabilities. Participant 1 was a 5-year-old female who had been diagnosed with Doose Syndrome, a seizure disorder, and labeled as developmentally delayed. Her IEP goal areas included pre-academic, adaptive, communication, fine and gross motor. Results from *Vineland Adaptive Behavior Scales* () showed she was functioning at an age equivalency of two years. The second participant was a developmentally delayed 4-year-old male receiving services in the areas of pre-academic skills, communication, and fine motor. Neither student was able to identify more than three common shapes by name, or recognize by visual prompts, at the start of this study.

The study took place within the self-contained special education preschool classroom at an elementary school in the Pacific Northwest. One of the participants was in the morning session of preschool and the other participant was in the afternoon session. Both classes were part of a special education preschool program consisting of a wide variety of students with mild to moderate disabilities. Data was collected at the beginning of the day during the entry task or at the end of the day during free play. Sessions lasted approximately 5-10 minutes either at a table on the opposite side of the classroom away from other children or at an isolated corner towards the back of the classroom. These locations were chosen to reduce the distraction from other students in the classroom.

Materials

Both participants used 3 x 5 inch laminated flashcards. One side of the card had a colored or non-colored shape approximately 1.5 inches by 2.5 inches in size. The other side had the name of the shape so that the presenter could easily give corrective feedback or praise to the child depending on the vocalization. A data sheet was used for each participant that consisted of the six different shapes being tested. Data sheets were marked for correct or incorrect choices with using a plus for correct and a minus for incorrect.

Dependent Variable and Measurement Procedures

The dependent variable for both participants in the study was correct vocalizations. For Participants 1 and 2, a correct vocalization for the flashcards was defined as the student saying the correct name of the shape within six seconds, or the student saying an incorrect name, but self correcting before moving on to the next flashcard. During the intervention period for Participant 1, a change in the criteria for the dependent variable was made. The participant was generalizing every shape shown to be either a triangle or a circle. The dependent variable for Participant 1 changed to having the correct vocalization of yes/no given the question "is this a triangle?" Correct responses were recorded as plus signs while errors were recorded as minus signs. Each participant had their own data sheet. The data sheet for Participant 1 consisted of six columns for the shapes and rows representing each day. The data sheet for Participant 2 also contained an additional row for the racetrack.

EXPERIMENTAL DESIGN AND CONDITIONS

A combined ABC and multiple baseline design (Barlow, Nock, & Hersen, 2008; Kazdin, 2010) across two students was used to evaluate the effectiveness of DI Flashcards on the recall and recognition of shapes. Each session took approximately 5-10 minutes to complete each day.

Pre-assessment.

Before beginning baseline or intervention a pre-test was given. Each participant was shown six pictures with a different shape on each picture. The students were asked to identify each shape by name. The results of the pre-test showed both children could not identify more than three shapes correctly.

Baseline.

For baseline, each participant was shown a flashcard with a different shape. The child was then asked, "What shape is this?" No feedback was provided to the participants. After each baseline session was completed, the participants were told, "Good job" or "Thank you for playing with me". Baseline lasted for three sessions for Participant 1 and five sessions for Participant 2.

DI flashcards-1.

After baseline, the Direct Instruction flashcards were implemented. At the start of every session, the participant would be presented with the deck of flashcards that consisted of 12 cards, each shape was in the deck twice. Each flashcard was presented one at a time and feedback was given. If the participant did not know the name of the shape or did not vocalize the correct name of the shape the presenter would model the correct name for the shape. The participant would then be led through the model-lead-test procedure. The incorrectly identified card would be placed three cards back in the deck for further instruction. After the cards had all been vocalized correctly, or if it had been over five minutes, The first author would point to one of the shapes and ask the child to name the shape. Then the presenter would tell the child they are going to

DI flashcards 2.

During intervention with the DI flashcards, the first author realized that Participant 1 was generalizing all the shapes to be either a triangle or a circle. After four sessions the intervention was changed for this participant. The flashcard would be shown to the participant and the question asked would not be, "What shape is this?" it would be, "Is this a triangle?" The participant would then answer the question with a correct vocalization of yes or no depending on the flashcard that was being presented. The same model-lead-test procedure was used when there was an incorrect vocalization. This condition was in effect for five sessions for Participant 1.

Reliability of Measurement and Fidelity of the Independent Variables

Interobserver agreement data was collected for Participant 1 for 33% of the study and for Participant 2 for 38% of the study. For Participant 1, data points were compared after the session. For Participant 2 data sheets were compared after the participant finished his third time around the racetrack. Interobserver agreement was found by dividing the number agreements by the number agreements and disagreements then multiplying by 100. An agreement was scored if both observers marked that they heard the same vocalizations if the vocalization was correct or incorrect. A disagreement was marked if they did not mark the same vocalization that was heard. Interobserver agreement for the Participant 1 was 95.8 % and for Participant 2 it was 95. 1%.

RESULTS

Participant 1

The number of correct vocalizations during baseline and intervention can be seen in Figure 1. During baseline the child scored an average of 1.75 correct responses. Throughout the first phase with flashcards the participant had an average of 1.25 correct responses. Due to the inconsistent correct vocalizations another phase stage was initiated. During the second DI flashcard condition, his average number of correct responses increased to 5.4.

Participant 2

The number of correct vocalizations during baseline and intervention of DI flashcards can be seen on Figure 1. During baseline the average number of correct responses was 2.4. During intervention with the flashcards the average number of correct vocalizations was 5.5.

Compared to baseline, Participant 1 showed an increase in shape discrimination during the second phase change, while Participant 2 showed an increase in both shape recall and recognition.

DISCUSSION

The findings have shown that the intervention with the Direct Instruction flashcards. Both participants showed improvement in their shape recognition or recall. Participant 2 was able to master the names of all six of the common shapes that were presented. Participant 1 was able to stop generalizing all the shapes and was able to understand what a triangle was and what a triangle was not. Over the course of the intervention she was also able to recall the name for a circle and a diamond as well as triangle.

The present research provides a partial replication of our previous work (Brasch et al., 2008; Glover et al., 2010; Hayter, Scott, Weber, & McLaughlin, 2007; Kaufman et al., 2011; Ruwe et al., 2011). It also provides a replication to a younger population and different dependent measure that we have employed.

There were several limitations to the study. One limitation to the study was that the intervention and data could not be taken each day. This was due to time constraints and the participant's attendance. For Participant 1 attendance was and remained a major issue. After the first week of implementing the intervention, she also started having seizures daily. As a result of these health issues attributed to her seizure disorder and other minor illnesses, she was frequently absent. Another limitation was that there was no follow up data taken as formal data collection ended with the completion of the first author's student teaching. A third limitation to the study was the setting of the study. Since the study was conducted in the classroom, at times there were lots of distractions. Even though the sessions were completed at a table or a part of the classroom that was set away from the other children the noise was still a distraction for our participants.

The study showed that there was an increase in shape recognition and recall for Participant 2. For Participant 1 there was not an immediate yet there was an increase in discrimination between shapes. To further prove the effectiveness of the intervention there needs to be further research on the use of DI flashcards with young students.

The use of single case methodology allowed for a change in the intervention procedures for Participant 1. This could have been difficult in a between groups design has been employed. Also, one can employ single case designs with small samples that are found in most preschool special education settings (Barlow et al., 2008; Horner, Carr Halle, McGee, Odom, & Wolery, 2005; Kazdin, 2010). In addition the collection of student performance and the use of more than one participant provided some initial evidence as to the efficacy of DI flashcards and the importance of being able to employ single case methodology in the classroom. Finally, the importance of changing oral prompts was documented with Participant 1. Clearly more research using DI flashcards with preschool students is needed.

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