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INCLUDING NONTARGETED INFORMATION WHEN TEACHING MULTIPLE EXEMPLARS OF SHAPES WITH THE CONSTANT TIME DELAY PROCEDURE

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THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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By

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Abstract of Thesis

INCLUDING NONTARGETED INFORMATION WHEN TEACHING MULTIPLE EXEMPLARS OF SHAPES WITH THE CONSTANT TIME DELAY PROCEDURE

Five elementary age students with moderate to severe intellectual disabilities were taught shape identification. A multiple probe design across behaviors, replicated across participants, was used to determine the effectiveness of constant time delay to determine the effectiveness of Constant Time Delay to teach shapes. Nontarget information was included in praise statements. All students met criterion on target information of shape identification. All students increased their ability to identify shape words, spell shape words, tell the number of sides of the shapes when presented and tell the number of angles of shapes presented. Generalization occurred during daily walks through the school and community as well as during the probe sessions.

KEYWORDS: Nontarget, Incidental Learning, Constant Time Delay, Multiple Probe Design, Shapes

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SECTION 1: INTRODUCTION

Embedding nontarget information within discrete trials has proven, in past studies, to increase generalization and knowledge on target objectives. Use of the constant time delay procedure (CTD) to teach the target skills has often been reported in those studies. CTD is a prompting strategy that is considered to be near errorless (Doyle, Wolery, Gast, & Ault, 1990). CTD procedures use a controlling prompt that is presented after a specified preset amount of time. Baseline data are collected, 0-s delay sessions (errorless learning trials) are completed, and instruction using the preset specific delay, begins and lasts until skills are mastered or criterion is met.

CTD is effective in small group and one-on-one instructional arrangements to teach discrete tasks, such as identification. However, some students may lack the ability to generalize the information into real world settings. By adding nontarget information in the form of instructional feedback, students are presented with extra information during praise statements. Students are not praised if they respond to nontarget information, nor are they required to apply or recall the nontarget information (Werts, Wolery, Gast, & Holcombe, 1995).

Nontarget information can occur in one of three places when teaching a skill. It can be placed in the antecedent, the prompt, or the praise or consequence statement. Collins and Stinson (1995) used instructional feedback to present nontarget information to teach key words on warning labels. All students in the study showed growth and learned some of the nontarget information. Students with multiple disabilities were taught to read grocery words using the CTD procedure in a study by Schuster, Morse, Griffen

and Wolery (1996). Grocery aisle signs were used to present and teach nontarget information in the form of instructional feedback.

LITERATURE REVIEW ON NONTARGETED INFORMATION

To date, there have been over 50 articles published on instructive feedback or nontarget information. Instructional feedback is designed to increase the amount of information taught without increasing the amount of time it takes to teach (Werts, Hoffman, &Darcy, 2011). Nontarget information can be inserted into trials during the antecedent or task direction, instructional (prompts), or consequent praise statement. Students are not expected to respond to the nontarget information and are not praised for doing so (Fiscus, Schuster, Morse, & Collins, 2002). As noted in a study by Falkenstine, Collins, Schuster and Kleinert (2009), systematic instruction using response prompting strategies, such as constant time delay, system of least prompts, and simultaneous prompting, decreases errors and promotes independent learning while providing assistance when needed. Individuals with disabilities are able to learn target information and nontarget information (e.g., chained or discrete tasks) in small groups or in one on one instructional arrangements. All studies included in this literature review used either system of least prompts, constant time delay, or simultaneous prompting procedures.

Nontarget information can be used to increase the efficiency of instruction with individuals with a variety of disabilities across a wide age range and can be embedded when teaching students functional or academic skills. Throughout the reviewed studies, nontarget information included in teaching sessions did not appear to slow down the rate of learning target information nor did it increase the amount of errors or trials. Nontarget information can either be task- related or completely unrelated stimuli, and students can learn the target and nontarget information just as well under either condition. (Fiscus et

al., 2002). Often, teachers become so focused on teaching and reviewing the target skill that they do not embed nontarget information within the trials or praise statements. However, these studies have provided proof that, with just a small amount of planning and resourcefulness, general education and special education teachers can embed information into their target lessons to enhance learning by including nontarget information.

Instructional feedback is when nontarget information is presented to students through praise statements. Instructional feedback occurs when a teacher adds extra information to the consequent event of an instructional trial. Generally, the information is provided in the form of praise. Instructive feedback trials could include the following: teacher secures attention of the student, shows the student the target stimulus and gives task direction, waits the specified amount of time, and, if the student responds correctly, the teacher would praise by saying, “You’re right, that is a ____, and a ____ can ____” (Werts et al., 2011).

In a study by Roark, Collins, Hemmeter, and Kleinert, (2002), presenting the nontarget information of a manual sign while stating the task direction to point to a specific item proved to be successful in teaching manual signs to four students in the secondary school setting. All four students were identified as functioning within the moderate to severe range of mental retardation. Presenting the sign added no additional time to each trial, yet this procedure allowed for additional information to be taught. Four students were taught to identify food items in the resource classroom. The students were presented with nontarget information once prior to and once after the instructional trials.

Three of the 4 students learned the target and nontarget information presented in the study.

In a study by Taylor, Collins, Shuster, and Kleinert (2002) focusing on teaching four high school students with moderate to severe disabilities to do laundry, the nontarget information was presented in the consequent event. The teacher would say the word, show it on a flashcard, and then point out the word on the washing machine or in the natural environment. The target skill was for each student to be able to complete a task analysis for doing laundry. Nontarget information taught during these trials was sight words printed on flashcards and shown in the natural setting.

Daugherty, Grisham-Brown, and Hemmeter (2001) included nontarget information in the antecedent event, teaching counting as a target skill and presenting colors as nontarget information. The instructor would present the items on the table and say, “Count the red blocks.” The student was given the color and the task direction at the same time without distracting the students from the task or adding instruction time to the lesson. All three preschool aged students met their objectives in counting and learned the nontarget information that was included. Research on nontarget information has proven to be successful with individuals from preschool to post secondary levels, as well as across a wide array of ability levels.

LITERATURE REVIEW VARIABLES

Ten studies were reviewed to provide a rationale for the proposed study. The variables from those studies are described in the following sections and are listed in Table 1.

Table 1. Literature Review Table

Author	**Year Published**	**Number of Participants**	**Age of Participants**	**Range of Disabilities**	**Setting**	**Skill Taught**
Daugherty et al.	2001	3	4 years 9 months – 5 years 2 months	Speech and language disabilities	Preschool	Teaching counting during class activities.
Falkenstine et al.	2009	3	16 years old	Moderate to severe disabilities	High School	Telling time, state abbreviations, and sight words.
Fiscus et al.	2002	4	8 years – 12 years	Moderate to Severe Disabilities	Elementary School	Teaching food preparation of simple snacks.
Jones & Collins	1997	3	31 years -45 years	Mild to Moderate Disabilities	Post Secondary	Teaching microwave skills.
Roark et al.	2002	4	17 years – 19 years 4 months	Moderate to Severe Disabilities	High School	Teaching manual signs.
Smith et al.	1999	4	16 years – 18 years	Moderate to Severe Disabilities, ADHD, Functional Mental Disability, and Seizure Disorder.	High School	Teaching to clean tables.
Smith et al.	2011	4	15 years 4 months-19 years 1 month	Moderate to Severe Disabilities, Other Health Impairment, and Mild Mental Disability	High School	Teach twelve restaurant words and to classify foods.
Taylor et al.	2002	4	16 years 5 months-20 years 7 months	Moderate and Severe Disabilities	High School	Teaching washing and drying clothes with multiple exemplars.
Werts et al.	2011	4	16 years 11 months- 18 years 2 months	Down syndrome, Autism, Specific LD, Developmental Disability with Speech Delay	High School	Teaching Social studies vocabulary
Woolery et al.	2000	3	15 years- 19 years	Mild Mental Disability, Mild Mental Disability with speech disorder, and Speech and Language Delay	High School	Teaching sight words.

CHARACTERISTICS OF THE PARTICIPANTS

In total, 18 males and 18 females participated in the 10 reviewed studies. Diagnoses included speech and language delays, mild to moderate disabilities, moderate to severe disabilities, developmental disabilities, autism, Down syndrome, epilepsy, and cerebral palsy. Table l shows the reviewed articles by author and date, number of

participants in each study, age of participants, gender, diagnosis, and target information and nontarget information taught. The participants ranged in age from 4 years, 9 months to 45 years old.

Daugherty et al. (2001) taught three preschoolers with speech delays counting while embedding colors. Only one study, Fiscus et al. (2002), included students in the elementary school range. These students were intermediate elementary school students ranging in age from 8-12 years with moderate to severe disabilities. These students were learning food preparation skills. All of the remaining eight studies focused on teaching secondary and post secondary participants ranging in age from 15 years to 45 years of age. In the Wolery, Schuster, and Collins (2000) study, the three students were labeled as having mild to moderate disabilities and ranged in age from 15-19 years. The remaining seven studies focused on secondary students, all labeled as having moderate and severe disabilities.

All articles reviewed used only students with diagnosed disabilities or speech delays. It was not noted and no evidence was provided to show that nondisabled, same age peers were included in any of the teaching or generalization process.

ENVIRONMENTAL CHARACTERISTICS

All of the studies took place within the classroom setting, most often the resource classroom. All probe sessions were conducted in a one-on-one setting; most trials were one-on-one or in a small group setting inside the resource room. In the study by Jones and Collins (1997), the instructors taught the skill inside the classroom, and, for generalization data, the skills were performed in the participants' homes. In the study by Roark et al. (2002), all generalization trials to locate items were completed while on community-based instruction at a convenience store. In the study by Smith et al. (1999),

students cleaned tables in the classroom, cafeteria of the school, and teachers' lounge, as well as at a local church in the community. While teaching students to do laundry in the study by Taylor et al. (2002), students used the family consumer sciences room during teaching and then they used two local Laundromats to provide generalization skills to students with moderate and severe disabilities.

CHARACTERISTICS OF INTERVENTIONS

The reviewed studies used a variety of materials, which were presented, in a variety of ways. While teaching food preparation and microwave skills (Fiscus et al., 2002; Jones & Collins, 1997), real food items and materials, such as silverware, microwaves, plates, and cups, were used. In the studies by Smith et al. (1999) and Taylor et al. (2002), students used tables, washcloths, washing machines, coins, detergent, and cleaning materials to complete the skills being taught. In other studies, materials such as flashcards and basic classroom items were used. It was noted that the skills that were taught with actual objects were also the skills that were generalized into the community or real world setting (homes, local Laundromat).

There is evidence that students learn nontarget information through the teaching of both chained tasks and discrete skills (Falkenstine et al, 2009). As shown in the Fiscus et al. (2002) study on teaching elementary aged students how to prepare food items, chained tasks were used to teach the skills. A task analysis of each skill being taught was created to ensure that the students were learning all of the needed steps. The nontarget information in this study was teaching kitchen utensils and words written on cards. The nontarget information was presented two times in the training sessions. The results of the study showed that 3 of the 4 students met criterion and learned the target information, and all students learned a portion of the nontarget information.

Discrete trial training was used in the study by Roark et al. (2002) that focused on teaching students to identify foods while including manual signing as nontarget information. Four secondary students were taught to identify packaged food using a constant time delay procedure. The nontarget information being presented was the manual sign of the item. Results show that 3 out of 4 students were able to learn the packaged food items. Furthermore, they were all able to learn some of the manual signs that had been presented as nontarget information.

RESEARCH DESIGNS

All of the articles used a multiple probe design across the behaviors or content being taught as well as being replicated across the participants was used to determine the effectiveness of using CTD to teach shapes and nontarget information in praise statements. Each study started with one child learning the material, and, as each child mastered the material being taught, another child would be brought into the baseline and instruction phases of the study.

SUMMARY OF LITERATURE REVIEW

Providing individuals with disabilities with target and nontarget information is an important aspect of teaching. Including nontarget information, while teaching skills that are focused on each individual student's Individualized Education Plan, creates opportunities to learn more information without extending group or one-on-one sessions. As shown in the studies reviewed, CTD, system of least prompts, and simultaneous prompting were all affective in increasing student knowledge with instructive feedback and nontarget information.

The studies provide evidence that including nontarget information during instruction with students across a wide variety of disabilities was effective. From

teaching students with only speech delays, as shown by Daugherty et al. (2001), to teaching students with moderate to severe disabilities, as shown by Werts et al. (2011), including nontarget information has proven to be an effective way to supplement teaching trials. Students in the general education setting could also benefit from the inclusion of nontarget information that is related and unrelated to subject lessons.

Functional skills, such as using a microwave, cleaning tables, and washing and drying clothes, were all target information taught in some of the reviewed studies. Academic skills, such as recognizing sight word, counting objects, telling time, using manual signing, and classifying food items, were also taught. This proves that both functional and academic skills can be taught and that nontarget information in the trials is useful in teaching a variety of information.

While the studies used in this literature review focused on participants from 4 years old to 45 years old, 8 of the 10 studies focused on individuals attending or exiting secondary school or post secondary educational settings. Since we know that adding nontarget information to skills being taught, possibly by including incidental information in the form of praise, can be effective, it would be beneficial for future research to take place in the elementary setting. By doing so, we could document that including nontarget information with younger individuals with disabilities increases learning opportunities just as it does with older students. Younger students could be learning and acquiring twice as much information with little extra planning or by adding little to no time to the lesson.

Teaching sight words, telling time, and using manual signs are important. Over the past 30 years, research has supported the increase of nontarget information in the

areas listed above; yet no studies to date have been done on teaching shapes to students with moderate to severe disabilities including nontarget information. Conducting a study with the shape presented as target information and the spelling of the shape word and descriptive statements about the shape presented as nontarget information would add to the existing research.

RESEARCH QUESTIONS

There are many areas in which the literature base can be increased on nontarget information. Using the information reviewed from the articles, this study used shape identification as the target skill and four nontarget pieces of information in the form of (a) shape word identification (b) spelling of shape words, (c) number of sides and (d) number of angles of shape. Nontarget information can be easy to include and can be effective when used in a variety of places during each trial.

This study answered the following research questions:

1. Will the CTD procedure be an effective strategy to teach shapes to elementary students with moderate to severe disabilities?
2. When shown multiple exemplars of shapes using real world pictures, will the student be able to identify when shown a novel exemplar?
3. Will students acquire four pieces of nontarget information presented as instructive feedback: (a) shape word recognition, (b) spelling of shape words, (c) the number of sides of each shape, and (d) the number of angles of each shape?

This study not only taught students the identification of shapes, but it also taught nontarget information in the form of instructional feedback. Instructional feedback includes nontarget information such as word identification, spelling of shape, number of

sides, number of angles. Students were then able to recognize shapes, read and spell shape words, and locate the shapes when presented with a novel card.

SECTION 2: METHOD

PARTICIPANTS

Five participants with moderate disabilities participated in this study. (See consent and assent forms in Appendix A.) Each participant had a history of using CTD procedures and could wait for task directions to be presented. All of the participants had adequate vision, hearing, and motor abilities. Each of the participants exhibited some expressive language difficulties; therefore, manual signing or communication devices were needed to respond.

The first participant in this study was GL. She was an 11 year, 3 month old female diagnosed as having a Functional Mental Disability (the Kentucky label for students with moderate and severe intellectual disabilities). GL was in the fifth grade. She attended the general education class during science, social studies, and elective classes, while she received math, reading, writing, and self help skill instruction in the resource room. GL attended speech twice per week for a total of 1 hr. GL was able to read over 250 sight words and phrases from the Edmark reading program; however, she was unable to generalize those into other settings. She was able to read or identify basic colors, school related words, schedule words, and numbers. In math, she was able to do double-digit addition with regrouping with the use of a number line. She was learning to count money, identify and create basic fractions, tell time to the half hour, and identify angles and higher-level shapes. In writing, GL was currently learning to write and spell her full name, address, social security number, date of birth, and phone number. GL's strengths

included organizing materials, reading, following directions, and assisting others. Her weaknesses included group participation in non-preferred groups, following group instructions in the general education classroom, and completing tasks independently in the general education classroom.

The second participant was IP. He was a 12 year, 2 month old male diagnosed with a moderate mental disability as well as Down syndrome. IP was in the fifth grade. He attended the general education class during science, social studies, and elective classes, while he received math, reading, writing and self help skills in the resource room. IP attended speech twice per week for a total of 90 min, occupational therapy once per week for 30 min, and physical therapy once per week for 30 min. IP was able to read approximately 70 sight words using the Edmark reading program, but was not able to generalize them to other settings. He was able to read color words. He used picture-supported text to assist in reading group and during daily activities. In math, IP was able to identify numbers to 20, use one to one correspondence up to 8, identify penny and nickel, match pattern blocks, and count by 10s to 100. He was unable to tell time, use a number line independently, or identify higher-level shapes. In writing, he was working on writing his first and last name legibly and with the correct order and spelling. He was also working on number formation. IP's strengths included the desire to want to learn, attentiveness, ability to listen and wait for others to respond during group, reading using picture prompts, and organization of materials and schedule. IP's weaknesses include distractibility, completion of work independently, ability to follow rules when presented by unfamiliar individuals, patterns, spelling, and speech sound production. He was given choices or a communication device to respond to some questions.

The third participant was DD. He was a 9 year, 6 month old male diagnosed with a moderate mental disability. DD as in the fourth grade and was able to communicate verbally. He attended science and electives within the general education classroom. DD received writing, math, reading, self help skills, functional skills, and social skills instruction in the resource room. DD went to Speech Therapy two times per week for a total of 60 min, occupational therapy once per week for 30 min, and physical therapy once per week for 30 min. DD was able to read over 100 sight words and some short phrases. He could read and identify pictures that represented what he had read. DD was able to use a mouse to navigate on basic websites and to type his name. In math, DD was working on recognizing coin values, counting by 10s, and using a number line. He was able to tell time to the hour and half hour, identify some basic level shapes, and count money and objects. In writing, DD used the computer to type his name, birthday, and address. He was able to use writing materials to produce legible words, letters, and numbers when given a model. DD's strengths included reading with picture supports, following directions, completing independent work, and making a choice. DD's weaknesses included self-help skills such as putting on clothing, retention of facts and materials, comprehension of reading materials, and completion of homework.

HS was a 9 year, 2 month old male diagnosed with autism. HS was in the third grade. HS attended morning routine, science, social studies, and elective classes in the general education setting. HS received math, reading, writing, social stories, and self help skills in the resource room. HS had occupational therapy once per week for 30 min, music therapy once per week for 30 min, physical therapy once per week for 30 min, and speech therapy twice per week for a total of 60 min. He also received services outside of

school and attended social groups outside of school. HS was able to read most any word list presented to him; however, he was working on reading short passages and answering basic comprehension questions, such as, “Who was the passage about?” or “What happened in the passage?” HS was able to write his personal information, including his birthday, name, and home address. In math, he was able to identify basic shapes, tell time to the hour, and use the next dollar strategy. HS’s strengths included reading single words, sequencing events, following a schedule, and eating independently. HS’s weaknesses included acting out when non-preferred activities were presented, screaming while transitioning, throwing materials, and following directions without multiple reminders.

The fifth student was GH. GH was an 11 year, 10 month old male labeled as having a mild to moderate disability. GH was in the fifth grade and was able to communicate verbally. He attended science, lunch, recess, and electives within the general education classroom. GH received writing, math, reading, self help skills, functional skills, and social skills in the resource room. GH went to Speech Therapy three times per week for a total of 90 min and occupational therapy once per week for 30 min. GH was able to read over 150 sight words and some short phrases. He read best when pictures that represented what he had read were presented and used for comprehension. In math, GH sas working on coin value, place value, basic math facts, and number line use. He was able to tell time to the hour and half hour, identify some basic level shapes, and count money or objects. In writing, GH was able to write his name, birthday, and address. He was able to use writing materials to produce legible words, letters, and numbers when given a model. GH’s strengths included reading with picture supports, following

directions, completing independent work, and doing classroom jobs. GH's weaknesses included self help skills such as putting on clothing, retention of facts and materials, and comprehension of reading materials, as well as social skill deficits and problem behaviors when learning in a group setting or with grade level peers.

SETTING AND MATERIALS

The study took place in the intermediate special education classroom in a rural elementary school in Kentucky. The special education teacher implemented the program in a one-on-one setting with each student daily. All sessions took place at a rectangular table at the front of the classroom. The table faced a cabinet, and all other students and staff were working in other areas of the room to minimize distractions. Materials used during each session included 4 x 6 inch white index cards with a real world image on the front and 36 pt black font word typed on the back. For each of the three shapes being taught to each student, there were three different shape cards with different pictures for generalization. During instruction, the following shapes and pictures were used: (a) Octagon - poker table, Ultimate Fighting Championship ring, and stop sign; (b) Pentagon - bird house, pot holder, and soccer ball; (c) Hexagon - tool, quilt, and honeycomb; (d) Triangle - pizza, recycle symbol, and yield symbol; (e) Oval - race track, diamond, and egg; (f) Square - oven, handicap sign, and computer screen. The following shapes and pictures were used as novel shapes: (a) Octagon - clock, (b) Pentagon - military building headquarters, (c) Hexagon - clock, (d) Triangle - slip and fall sign, (e) Oval - platter, (f) Square - table. Sessions occurred in the mornings between 9-10 a.m., and the afternoon sessions occurred between 2-2:30 p.m.

DATA COLLECTION AND EXPERIMENTAL PROCEDURES

Sessions consisted of one-on-one learning opportunities using CTD procedures. Each day, the student in the current tier of learning took part in two sessions of learning the three target shapes assigned to that student, based on probe data. All sessions consisted of nine opportunities for the student to respond (three trials per shape). Students had five possible responses to be recorded: (a) no response, (b) correct before the prompt, (c) incorrect before the prompt, (d) correct after the prompt, and (e) incorrect after the prompt. The nine trials were based on three opportunities for each of the three shapes targeted. Students took part in shapes group each day with a minimum of one session (nine trials) and a maximum of two sessions (18 trials) per day. Sessions occurred between 9-10 a.m. and 2-2:30 p.m. in the special education classroom. Each session lasted no longer than 10 min total.

In the baseline probe sessions, each student was shown a total of nine shape cards. When presented with the shape card and given the task direction, “What shape?” participants were given 3 s to respond before the next task direction was given, and nontarget information was included while showing the shape word on the other side of the card. If the correct response was given before the prompt, the student received a + in the before column; if incorrect before the prompt, a – was given in the before column. Students were not corrected or praised for responses during the probe phase of learning. There were no opportunities for any responses after the prompt, as there were no prompts given during baseline. Each student was then asked to locate or spell the shape word associated with the picture shown. Response codes to spelling task direction were the same as for shape identification.

The 0-s delay phase lasted for 2 days, totaling four sessions. Each session consisted of nine opportunities for the participant to respond. When presented with the shape word card, verbal spelling, and the task direction, “What shape?” participants were given 0 s to respond before the prompt was given. If the correct response was given, the student received a + in the after column; if incorrect after the prompt, a – was given in the after column. Students that did not respond received a – in the after column. Each trial followed this sequence: Students were shown the shape and given 0-s delay, then presented with a verbal response to the shape shown; the card was then flipped, and the shape word was presented with the spelling and sight word emphasized; the card was then flipped back over, and the shape was stated again along with the number of sides and angles the shape had.

During the 3-s delay phase, students saw the same cards and task direction as in the 0-s phase. Each session consisted of nine opportunities for the participant to respond. When presented with the shape word card, verbal spelling, and the task direction, “What shape?” participants were given 3 s to respond before the prompt was given. If the correct response was given, the student received a + in the before column; if incorrect before the prompt, a – was given in the before column. After the 3-s delay, a verbal prompt was given. Correct responses after the prompt were coded as a + in the after column; incorrect answers received a – in the after column. Students who did not respond before or after the prompt received a – in the after column. Students were shown nontarget information as real world pictures, word identification, numbers of angles and sides, and spelling presented as feedback in the form of praise after each trial. Trials continued with each student until three days at 100% accuracy was met. Students were shown the shape, given

a 3-s delay, and praised for correct responses with nontarget information presented for the shape shown; the card was flipped and the shape word was presented with the spelling and sight word emphasized; the card was flipped back over and the shape was stated again along with the number of sides and angles the shape had. If student errors before the prompt occurred, students were reminded to wait and the answer would be given to them, and then nontarget information was presented in the same way as for correct responses.

MAINTENANCE PROCEDURES

Maintenance probes were conducted after each participant reached criterion on a set of shapes. Students were presented with all shapes used during instruction, asked the target information as well as presented with novel shapes that had never been taught. At the beginning of each session an attentional cue was given, followed by a task direction. The participants were given 3 seconds to respond to task directions just as they were in the instructional phase of learning. Correct responses resulted in praise and incorrect answers were corrected and the student was reminded to wait for the answer and praised for good attention.

GENERALIZATION PROCEDURES

Generalization sessions were conducted during the maintenance probes through use of novel shapes. Students had the opportunity to show generalization skills at each probe session. Throughout the school there are several shapes that were shown to students as they were in different settings to reiterate the shapes being taught. Generalization sessions took place in the resource setting during probes as well as throughout the school during the instruction phase of learning.

PROBES ON NONTARGET INFORMATION

Probes on nontarget information were completed in the same order and time delay as the 3s delay instructional phase procedures. Students were given an attentional cue to attend followed by a task direction to tell the desired nontarget information (spelling, word identification, number of angles, and number of sides.) Students were reinforced for correct responses. For incorrect responses, students were reminded to wait and then were presented with the correct response. Probe sessions took place before each student began the study and again once a student within his or her graph (GL, DD) (HS, IP, GH) met criterion.

EXPERIMENTAL DESIGN

This study was completed using a multiple probe across students (Gast, 2010). Student progress on identification of shapes was measured during CTD procedures within a multiple probe design. This instructional data determined whether students could learn to identify three unknown shapes when shown multiple exemplars, as well as whether students could learn nontarget information when presented in the form of praise, on how to spell, identify the shape word, and give shape side and angles. Baseline data were collected for 3 days. The baseline data provided data that all students in the study could benefit from shape instruction. The intervention phase lasted for each student until the criterion of 100% of shape identification was met for 3 days. The time lagged presentation of instruction across 5 students within a multiple probe design established experimental control in that the students did not acquire the content until intervention took place.

The study followed this pattern: (a) screening of all students on a variety of shapes, (b) Probe One conducted on all students using the individual shapes selected after

the screening process, (b) intervention with GL and HS until criterion was met, (c) Probe Two conducted on all students again and GL and HS were introduced to the novel items and non target information, (d) IP and DD participated in intervention until criterion was met, (e) Probe Three conducted on all students again and GL, HS, IP, and DD were introduced to the novel items and non target information; (f) instruction with GH until criterion was met, and (g) final probe conducted on all students again with all students probed on the novel items and non target information. In this study, two students were started at the same time and then intervention was time lagged with the other students. Therefore, one graph shows two time-lagged tiers, and the other graph shows three time-lagged tiers. Once each participant met criteria, a probe of all students was completed to assure learning of target and nontarget skills were being maintained.

INTEROBSERVER AGREEMENT

Interobserver Agreement (IOA) data were collected during each condition across students for a minimum of 20% of sessions. SR, a classroom paraprofessional, sat across from the teacher for baseline, instruction, and novel item sessions. Data sheets to collect data are the same as the lead instructor and data are collected at the same time as the lead instructor. After each reliability session, the lead teacher and paraprofessional compared data points and calculated the IOA data using the point by point method. Reliability agreement was calculated by taking the total agreements and dividing it by the agreements plus disagreements times 100. Sample blank data sheets are attached in Appendix B.

Procedural fidelity measured the reliability of the independent variable. SR sat across from the lead teacher for 20% of the sessions across conditions and filled out a checklist on each step of the session being followed.

Probe session data were collected across four sessions per student totaling 20 sessions. During the study there were a total of 35 probe sessions. Out of the 20 sessions there were 3 errors noted. I forgot to give praise to the student on 2 occasions and I forgot to mark a response during another session. 99.8% accuracy was documented as the procedural reliability across sessions observed. 57% of probe sessions were observed.

During probe sessions, inter observer agreement data were collected as well. Out of 57% of the sessions observed, 100% inter observer agreement was obtained. There were no errors between the observer and me on scoring student responses.

0s session data were collected across three sessions per student. During the study there were a total of 15 sessions during 0s delay procedures. Out of the 15 sessions total only 5 were observed. Out of the 33% of the sessions that procedural reliability was collected, there were no errors reported and 100% of the procedures were followed.

During 0s sessions, inter observer agreement data were collected as well. Out of 33% of the sessions observed, 100% inter observer agreement was obtained. There were no errors between the observer and me on scoring student responses.

3s session data were collected across 11 sessions for GL, 9 sessions for HS, 9 sessions for DD, 9 sessions for IP and 17 sessions for GH. The total amount of 3s sessions was 54 sessions. Out of the 54 sessions procedural reliability was collected on 15 different observations across students. 28% of the sessions were observed and data were collected with 100% accuracy across all sessions.

During 3s sessions, inter observer agreement data were collected as well. Out of 28% of the sessions observed, 100% inter observer agreement was obtained. There were no errors between the observer and me on scoring student responses.

Maintenance reliability data were collected during 5 sessions out of the 17 maintenance probe sessions completed. Out of the 29% of the sessions observed there was 100% accuracy in procedural reliability.

During maintenance sessions, inter observer agreement data were collected as well. Out of 29% of the sessions observed, 100% inter observer agreement was obtained. There were no errors between the observer and me on scoring student responses.

SECTION 3: RESULTS

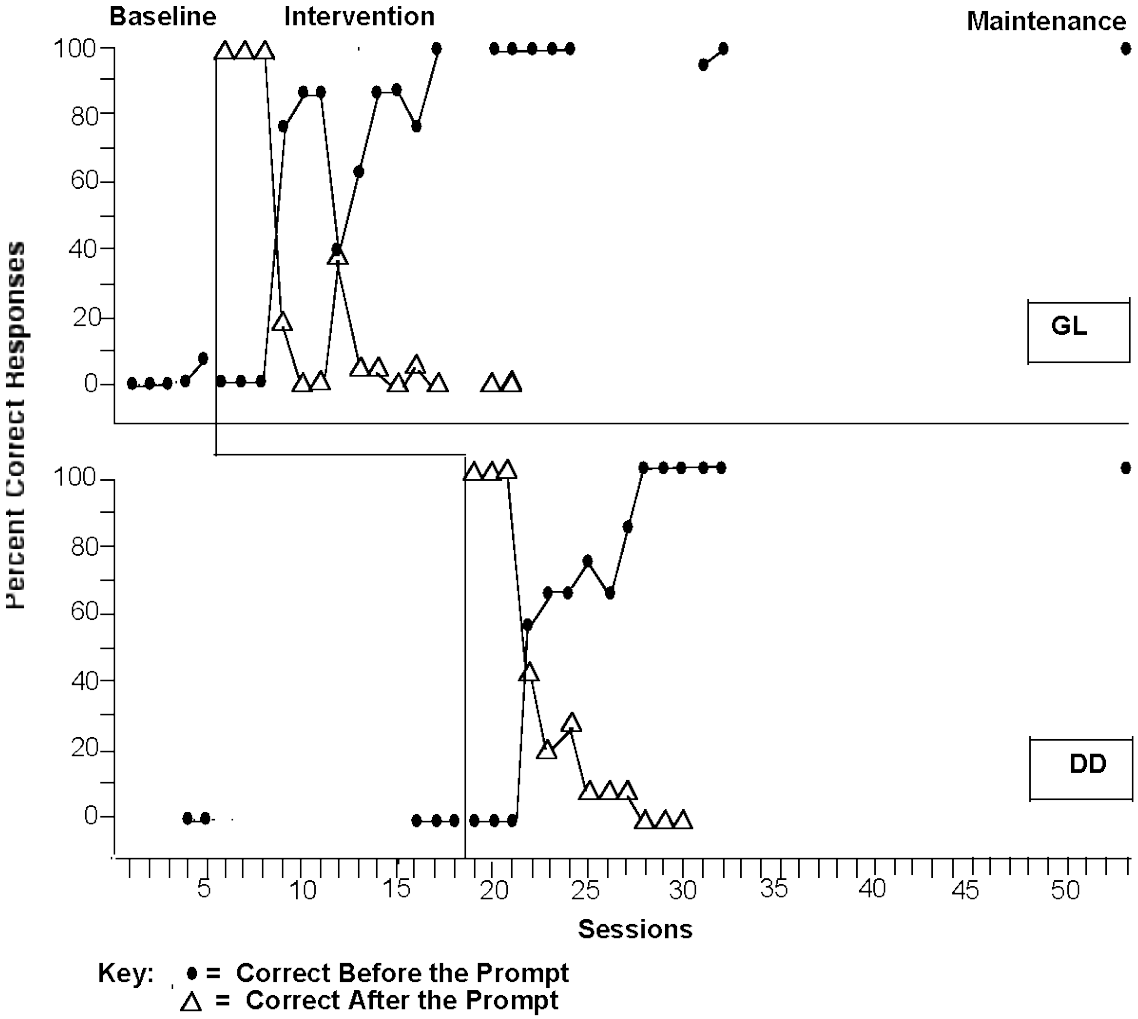
The results of this study show that teaching shapes with four pieces of nontarget information to five students with moderate to severe intellectual disabilities was effective. The study also shows that students were able to generalize shape knowledge to a novel image. All students had an increase in target and nontarget information taught during this study. During this study, there were two sets of students learning concurrently. GL and HS started at the same time in the first tier, and then IP and DD started in the second tier, and GH was in the third tier of the study. (See Figures 1 and 2.) Each student had to complete 3 days at 100% accuracy on target information to meet criterion.

GL was screened on all shapes for this study, and, in the beginning, she knew the basic shapes. However, she did not know the higher level shapes, such as octagon, hexagon, and pentagon. During this study, GL learned the higher level shapes. She completed 3 days of baseline at 0% correct responses. She was then probed on all target and nontarget information as well as novel item shape images; again she scored 0%. GL was then taught the shapes and presented with the nontarget information for 3 days at 0-s delay. During the 0-s delay, she received 0% correct before the prompt and 100% correct after the prompt on all three sessions. She then began intervention, which allowed for a 3-

s delay before the correct response was presented. It took GL 11 sessions to reach criteria of 3 days at 100%. GL had 100% on 4/5 probe sessions after criterion was met. On the one day that she did not get 100%, she received a 94% due to misspelling of “hexagon.”

DD: In Tier Two, starting when GL met criterion, was DD. During screening, DD was unable to identify the basic shapes, triangle, square, and oval as well as the higher level shapes. Therefore, during the study, the three basic shapes were his target information. DD completed 3 days of baseline of which all were 0% correct responses. He was then probed on all target and nontarget information as well as novel item shape images; again, he scored 0%. DD was then taught the shapes and presented with the nontarget information for 3 days at 0-s delay. During the 0-s delay, he received 0% correct before the prompt and 100% correct after the prompt on all 3 sessions. DD then began intervention, which allowed for a 3-s delay before the correct response was presented. It took DD nine sessions to reach criteria of 3 days at 100% with a 3-s delay. DD had a 100% on 3/3 probe sessions after mastery of target information.

Figure 1. Results for GL and DD



HS: In Tier One of the second graph (Figure 2), HS was unable to identify the higher-level shapes, octagon, hexagon, and pentagon. Therefore, during the study, the three higher level shapes were his target information. HS completed 3 days of baseline of which all were 0% correct before the prompt responses. He was then probed on all target and nontarget information as well as novel item shape images; again, he scored 0%. HS was then taught the shapes and presented with the nontarget information for 3 days at 0-s

delay. During the 0-s delay, he received 0% correct before the prompt and 100% correct after the prompt on all 3 sessions. HS then began intervention, which allowed for a 3-s delay before the prompt was presented. It took HS nine sessions to reach criteria of 3 days at 100%. HS had 100% accuracy on 5/5 probe sessions after mastery of target information.

IP: In Tier Two of the second graph (Figure 2), IP was unable to identify the higher-level shapes, octagon, hexagon, and pentagon. Therefore, during the study, the three higher-level shapes were his target information. IP completed 3 days of baseline of which all were 0% correct before the prompt responses. He was then probed on all target and nontarget information as well as novel item shape images; again, he scored 0%. IP was then taught the shapes and presented with the nontarget information for 3 days at 0-s delay. During the 0-s delay, he received 0% correct before the prompt and 100% correct after the prompt on all three sessions. IP then began intervention, which allowed for a 3-s delay before the correct response was presented. It took IP nine sessions to reach criteria of 3 days at 100%. IP had scores of 94%, 89%, and 100% on his 3 probe sessions after reaching mastery of target information.

GH: In Tier Three of the second graph (Figure 2), GH was unable to identify the higher-level shapes of octagon, hexagon, and pentagon. Therefore, during the study, the three higher-level shapes were his target information. GH completed 3 days of baseline of which all were 0% correct before the prompt responses. He was then probed on all target and nontarget information as well as novel item shape images; again he scored 0%. GH was then taught the shapes and presented with the nontarget information for 3 days at 0-s delay. During the 0-s delay, he received 0% correct before the prompt and 100% correct

after the prompt on all three sessions. GH then began intervention, which allowed for a 3-s delay before the prompt was presented. It took GH 17 sessions to reach criteria of 3 days at 100%. GH had 60% on the one probe session after mastery of target information.

Figure 2. Results for HS, IP, and GH

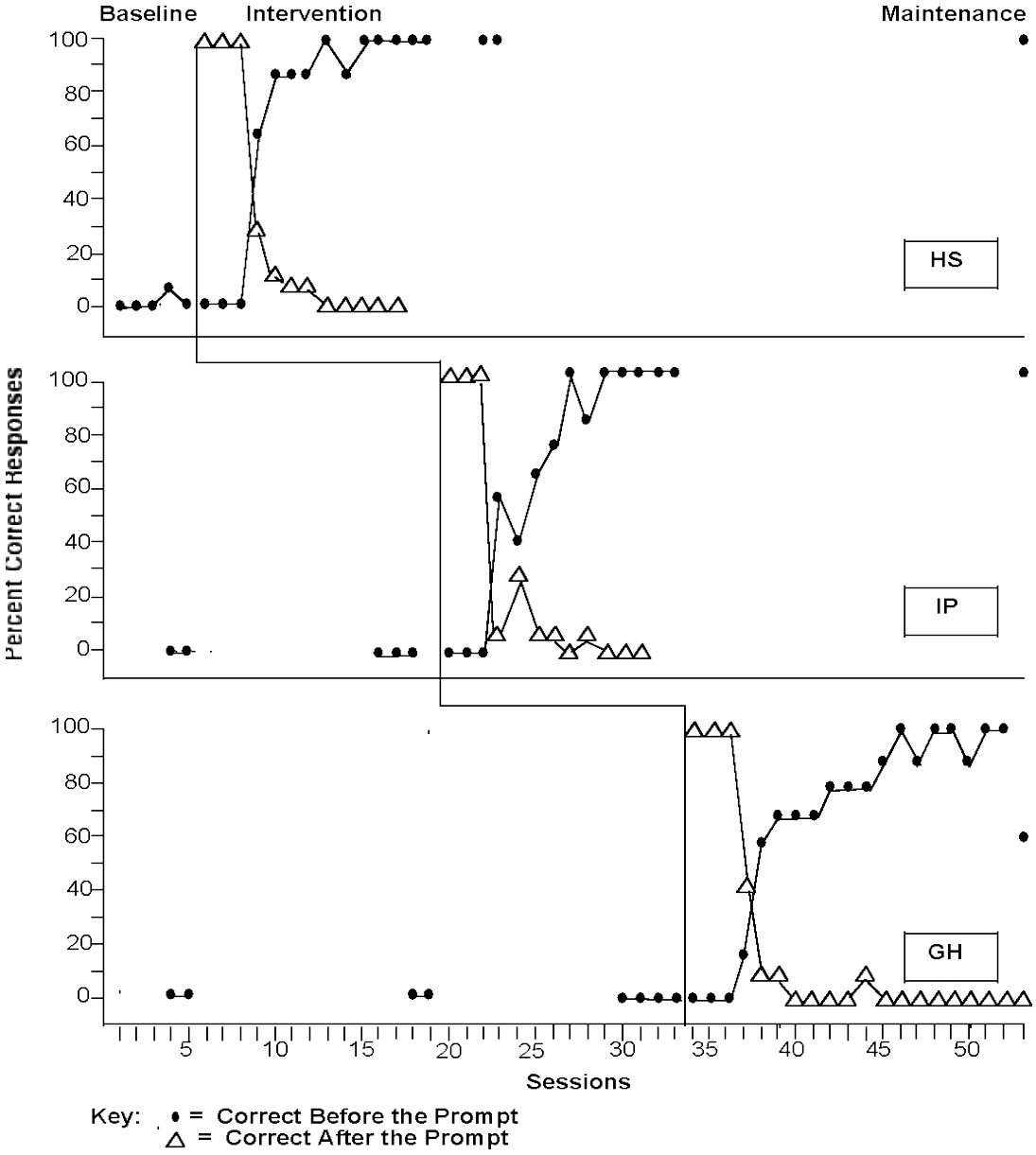


Table 2. Instructional Sessions to Criterion

Student	**Shapes being Taught**	**Number of Probe session before intervention**	**Number of Baseline sessions**	**Number of 0-s delay sessions**	**Number of 3-s delay sessions (to mastery)**	**Number of Probe sessions after mastery**
GL	Octagon, hexagon, pentagon	2	3	3	11	5
DD	Triangle, square, oval	4	3	3	9	3
HS	Octagon, hexagon, pentagon	2	3	3	9	5
IP	Octagon, hexagon, pentagon	4	3	3	9	3
GH	Octagon, hexagon, pentagon	6	3	3	17	1

MAINTENANCE

Overall, all students were able to maintain the target and nontarget information taught during this study. GH was the last student to reach criteria and, due to lack of time before state testing began, only one probe score after mastery was recorded. All other students were able to maintain information across 3-5 probe sessions, over a total of seven weeks, with scores ranging from 89%-100%. HS and DD were able to maintain both target and nontarget information at 100% accuracy. GL had a mean score of 98.8% on the five probe sessions after mastery with a range of 94%-100%. IP had a 94% mean score across his three probes after mastery with a range of 89%-100%.

GENERALIZATION

Overall, students were able to generalize the information from one target shape to a novel shape. During the after intervention probes, IP was able to successfully identify

an octagon and pentagon when shown a novel object but, on 2 out of 3 probes, was unable to identify the hexagon when shown a novel object. GH was able to successfully identify the pentagon when shown a novel object but was unable to identify the hexagon or octagon. GL, HS, DD were all able to generalize from the target shape to a novel shape with 100% accuracy across 3 to 5 sessions. Novel objects were items you would find in the real world setting and were items the student had not been taught during instructional trials.

NONTARGETED INFORMATION

All students increased the ability to respond on probes for nontargeted information of word identification, spelling, number of sides, and number of angles.

Table 3: Nontargeted Information

	Word Identification		Spelling		Number of Sides		Number of Angles	
Name	Pre	Post	Pre	Post	Pre	Post	Pre	Post
GL	8%	100%	0%	93%	0%	100%	0%	100%
DD	0%	100%	0%	100%	0%	100%	0%	100%
HS	100%	100%	0%	100%	0%	100%	0%	100%
IP	0%	100%	0%	88%	0%	100%	0%	100%
GH	0%	100%	0%	0%	0%	67%	0%	67%

SOCIAL VALIDITY

When beginning this study, social validity was of great importance in three areas. Researchers wanted to know how and in what order shapes were taught in the general education classroom as well as how long it would take for a general education peer to respond to the shape cards used to teach shapes in this study and where within the school

could students see the shapes naturally. Three third-grade teachers were asked to put in sequence the shapes they teach from the first of the year to the end of the year. The following is the information from the general education teachers. Mrs. H taught square, triangle, oval, pentagon, octagon, and hexagon. Mr. C taught oval, triangle, square, pentagon, hexagon, and octagon. Mrs. G taught triangle, square, octagon, hexagon, pentagon, and oval. While none of the three teachers taught these shapes in the same sequence, they all agreed that, by the end of third grade, students should be able to identify all of the shapes, number the sides, and number the angles.

Four students in the third grade were asked to respond to the shapes when presented with them, and the following response times for each shape were gathered: (a) Octagon - 8, 9, 7, and 10 s across the four students; (b) pentagon - 4, 3, 4, and 5 s across the four students; (c) hexagon: 6, 5, 3, and 5 s across the four students; (d) oval - 5, 5, 2, and 2 ss across the four students; (e) triangle - 2, 2, 2, and 2 s across the four students; and (f) square - 3, 4, 2, and 1 s across the four students. Based on these data, and what students were currently using in my classroom during other instructional groups, a 3-s delay was chosen and used for teaching students shapes in this study.

As for finding shapes within the school that students could find and could pointed out to students as they were in the hallways, all shapes could be found with the exception of an octagon. Tables in the library and stepping-stones in the garden were noted as hexagons. The birdhouse, “Snoopy” doghouse, and Mrs. K’s rug were noted as pentagons. The speakers in the cafeteria were ovals. The window in each class door, restroom sign, floor tiles, trashcans, little books, and computer screens were noted as all being square. Triangles were found as doorstops, cones for caution, and a pizza sign in

café. Students could see many shapes throughout the school daily. These were just some of the shapes discussed when on shape generalization hunts throughout the school.

SECTION 4: DISCUSSION

Students across all grades and subjects use shape identification in core content as well as real world applications. Students within the special education classroom can benefit from small group and one on one teaching to master skills such as shapes. The purpose of this study was to determine the effectiveness of the CTD procedure to teach shapes, see if students could generalize to novel images, and monitor whether students could recall shape word recognition, spelling of shape words, the number of sides of each shape, and the number of angles of each shape, when provided as incidental information. All of the above questions answered by the study were valuable and meaningful to this age range of students. In third grade, students learn shapes identification of higher-level shapes, angles, and sides of shapes. It is meaningful to all students to be able to identify shapes and locate the shapes around them. Shape identification can be helpful in emergency, school, and community settings across a variety of situations.

This study proved that students benefit from the inclusion of nontarget information when presented in the praise statement. All students gained some knowledge related to the target information through information taught in the form of nontarget praise statements. While learning the shapes in the instruction phases of learning, students would be reminded of shape identification and nontarget pieces of information as target shapes were passed in the school or community. If I were to replicate this study, I would collect data on the amount of opportunities students had to locate and were specifically exposed to shapes in the environment around them.

LIMITATIONS

There were minimal health, snow days, days away from school, and disrupted days throughout the study. Students all had good attendance and were reported as being on task and engaged during the teaching and probe sessions. Some limitations include, a small age range, small range of abilities and disabilities, setting limitations and limited core content being taught.

IMPLICATIONS

Through Internet searches, walking around the school building and in the community, I was able to identify several naturally occurring shapes. However, the higher level shapes took a bit more searching. Some of the shapes were difficult to find and often the higher shapes came up with the same images for hexagon as they did octagon. I would have liked to find shapes that were more frequently occurring in a day to day setting, but a hexagon, octagon, and pentagon are difficult to locate in the natural environment.

It is extremely important that teachers make use of time and use nontarget information in praise and in task directions. At recent faculty meetings, teachers complain of not having enough time to teach and instruct students on all content they need to know for state assessments. My suggestion using data from this study was to include nontarget information in all lessons as often as possible. When teaching spelling, give the definition, when teaching map skills tell state abbreviations, when teaching math facts teach students to spell the answer as it would be written on a check not only in numerical form. There are numerous opportunities across all settings, subjects, teachers, and content to add nontarget information into the lesson. With minimal planning you can multiply your lesson content tremendously.

SECTION 5: FUTURE RESEARCH

Based on my research during this study, conducted in the FMD room with only five students with moderate and severe intellectual disabilities, it could be replicated with a variety of students in multiple settings across ages. Students in the general education classroom could benefit from exposure to nontarget information. It would be easy and add very little time to lessons for a teacher to include nontarget information related to the topic being taught. Students of all ages could benefit from nontarget information being included in the content being taught. This study could be replicated in the general education classroom with special education students, general education students, or a mixture of both populations in future studies. In future research, students could be taught in a small group setting rather than in a one on one setting as presented in this study. Overall this is a topic that merits future research.

This study allowed for a 3 second delay between task direction, student response and when the controlling prompt was presented in the form of the correct answer. When social validity was completed, students in the general education class took longer than 5 seconds on average to respond to the higher level shapes used in this study. While students learned and retained the information taught in this study very well, if I were replicate this study, I would consider extending my delay to 5 seconds.

Research conducted outside of the resource classroom on discrete skills would also add to the research and data on nontarget information. Nine out of 10 articles reviewed for this literature review had training sessions taking place in the resource room. The exception was the study by Taylor et al. (2002) where the students used washing and drying machines in the family consumer science room. Teaching students in the general education classroom while other peers are present and working on their own

skills could add to the research by facilitating generalization in a natural setting and may even show an increased rate of learning since peers are present. A study could take place in art, gym, science, or morning meeting, just as long as it is in a setting other than the resource room.

Integrating peers without disabilities would also further research in nontarget information. In all of the studies used for this review, none of them integrated students without disabilities. Having the instructional group include some students with disabilities and including maybe two students from the general education class with similar learning targets could increase learning for all of the students. Including students without disabilities in a learning group would allow for observational learning of both target and nontarget information. While we do this in collaborative classes, in my classroom, I typically only conduct groups with my students (i.e., students with disabilities). If I were to include typical peers as well, it would increase the research in this area and possibly prove that it is beneficial for both students with and without disabilities.

In the articles reviewed, the target information was taught and there were only one to two pieces of nontarget information included. In the future, it would be very beneficial and interesting to see if students can acquire more than one piece of nontarget information per target skill they are being taught. For example, a study could include one nontarget fact in the antecedent or in the task direction and then two or more in the instructional feedback or praise statement.

APPENDIX A

Consent Form

September 13, 2011

To the Parents of _____,

As a graduate student of the University of Kentucky, I am writing to gain consent to conduct a study on shapes with your child. The results of this study will be shared with and discussed with faculty members at the University of Kentucky in the special education department. The results and procedures will be discussed but your child's name will not be used. During the study, your child's information will remain anonymous.

This study will in no way alter your child's grades or individualized educational program here at Cane Ridge Elementary. The information gained from this study is being used to increase research and knowledge on teaching methods across a variety of domains.

Please sign below to indicate that you are aware and in agreement with your child participating in the study. I will share final results with you and alert you when the study begins.

Thank you for your support,

Samantha Matthews

University of Kentucky

APPENDIX B

Sample Data Sheets

Shapes Screening Sheet

Basic Shape Identification

Higher Shape Identification

Basic Shape Identification, Spelling, and Novel Item Probe Data

Higher Shape Identification, Spelling, and Novel Item Probe Data

Probe Reliability

Shapes Screening Sheet

Student: _____
Observer:_____

Key: + correct - incorrect

Shape:	Response:
Circle	
Square	
Triangle	
Oval	
Rectangle	
Octagon	
Hexagon	
Pentagon	
Percentage Correct:	
Date:	

Shapes Incorrect: _____

Basic Shape Identification

(using real world and core content images with sight word) (Triangle, Oval, Square)

Student: ____ Delay: _______ Goal: ________________

Key: + correct - incorrect 0 no response

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Shape:	B	A
Square		
Triangle		
Oval		
Triangle		
Square		
Oval		
Square		
Triangle		
Oval		
% Correct		
Date		

Higher Shape Identification

(using real world and core content images with sight word) (hexagon, pentagon, octagon)

Student: ____ Delay: _______

Goal:________________

Key: + correct - incorrect 0 no response

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Shape:	B	A
Octagon		
Pentagon		
Hexagon		
Pentagon		
Octagon		
Hexagon		
Octagon		
Pentagon		
Hexagon		
% Correct		
Date		

Basic Shape Identification, Spelling, and Novel Item Probe Data

(real world/core content)

Student: _____ Delay:_____

Key: + correct - incorrect 0 no response

Shape:	B	A
Identify shape Square		
Say the word Square		
Spell the word square/ identify		
Tell how many sides the square has		
Tell how many angles the square has		
Identify the shape Triangle		
Say the word Triangle		
Spell the word Triangle/ identify		
Tell how many sides the Triangle has		
Tell how many angles the triangle has		
Identify the shape Oval		
Say the word Oval		
Spell the word Oval/ identify		
Tell how many sides the Oval has		
Tell how many angles the oval has		
Novel Square		
Novel Triangle		
Novel Oval		
% Correct		
Date:		

Shape:	B	A
Identify shape Square		
Say the word Square		
Spell the word square/ identify		
Tell how many sides the square has		
Tell how many angles the square has		
Identify the shape Triangle		
Say the word Triangle		
Spell the word Triangle/ identify		
Tell how many sides the Triangle has		
Tell how many angles the triangle has		
Identify the shape Oval		
Say the word Oval		
Spell the word Oval/ identify		
Tell how many sides the Oval has		
Tell how many angles the oval has		
Novel Square		
Novel Triangle		
Novel Oval		
% Correct		
Date:		

Higher Shape Identification, Spelling, and Novel Item Probe Data

(real world/core content)

Student: _____ Delay:_____

Key: + correct - incorrect 0 no response

Shape:	B	A
Identify shape Octagon		
Say the word Octagon		
Spell the word octagon/ identify		
Tell how many sides the octagon has		
Tell how many angles the octagon has		
Identify the shape Hexagon		
Say the word Hexagon		
Spell the word Hexagon/ identify		
Tell how many sides the Hexagon has		
Tell how many angles the hexagon has		
Identify the shape Pentagon		
Say the word Pentagon		
Spell the word Pentagon/ identify		
Tell how many sides the Pentagon has		
Tell how many sides the pentagon has		
Novel Octagon		
Novel Hexagon		
Novel Pentagon		
% Correct		
Date:		

Shape:	B	A
Identify shape Octagon		
Say the word Octagon		
Spell the word octagon/ identify		
Tell how many sides the octagon has		
Tell how many angles the octagon has		
Identify the shape Hexagon		
Say the word Hexagon		
Spell the word Hexagon/ identify		
Tell how many sides the Hexagon has		
Tell how many angles the hexagon has		
Identify the shape Pentagon		
Say the word Pentagon		
Spell the word Pentagon/ identify		
Tell how many sides the Pentagon has		
Tell how many sides the pentagon has		
Novel Octagon		
Novel Hexagon		
Novel Pentagon		
% Correct		
Date:		

Probe Reliability

+ teacher did   - teacher did not do

Student: ____

Observer:____

Prompt: Date:				
Teacher gave attentional cue.				
Task direction “What shape?”				
Delay of 0-3 sec				
Response marked				
Praise given				
Task direction “Say the word?”				
Task direction “Spell the word?”				
Task direction “How many sides does it have?”				
Task direction “How many angles does it have?”				
Teacher gave attentional cue.				
Task direction “What shape?”				
Delay of 0-3 sec				
Response marked				
Praise given				
Task direction “Say the word?”				
Task direction “Spell the word?”				
Task direction “How many sides does it have?”				
Task direction “How many angles does it have?”				
Teacher gave attentional cue.				
Task direction “What shape?”				
Delay of 0-3 sec				
Response marked				
Praise given				
Task direction “Say the word?”				
Task direction “Spell the word?”				
Task direction “How many sides does it have?”				
Task direction “How many angles does it have?”				
Novel shape 1				
Delay 0-3 sec				
Response marked				
Praise given				
Novel shape 2				
Delay 0-3 sec				
Response marked				
Praise given				
Novel shape 3				
Delay 0-3 sec				
Response marked				
Praise given				
Percentage Correct				

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