Using Simultaneous Prompting to Teach Restaurant Words and Classifications as Non-target Information to Secondary Students with Moderate to Severe Disabilities

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Abstract: This paper reviews selected literature pertaining to simultaneous prompting and the acquisition of non-target information for individuals with moderate to severe disabilities. The purpose of this review was to discuss the definition of non-target information (NTI) and the various places it can be embedded within an instructional trial. The acquisition of NTI has become especially critical to teachers who serve this population of students. Incidental learning provides teachers with an opportunity to increase a student’s exposure to information without increasing instructional time, therefore increasing the efficiency of the teacher’s instruction. A multiple probe design with full conditions across behaviors and replicated across participants evaluated the effectiveness of simultaneous prompting (SP) when teaching four participants with moderate and severe disabilities to read 12 sight words from community restaurants. In addition, the researcher examined generalization of the non-target information provided in the discriminative stimulus. Data indicated that SP was effective in teaching the participants the targeted sight words and the participants maintained the knowledge at high rates over time. Additionally, participants acquired NTI knowledge of the food classification embedded in the discriminative stimulus.

As expectations for students with moderate or severe disabilities increase, effective and efficient instruction is of the highest importance to special education professionals. The struggle of fitting as much instruction as possible is a difficult task for even the most senior of teachers. By decreasing instructional and teacher preparation time while increasing the amount of instruction and feasibility, embedding non-target information (NTI) is one strategy that has proven to be a successful method to accomplish the goal of increasing efficiency (Wolery, Holcombe, Werts, & Cipolloni, 1993). Incidental learning can occur when researchers embed NTI within the instructional trial sequence and participants learn that information without direct instruction. This opportunity to include NTI along with target information is key in maximizing a participant’s opportunity to learn.

To date, researchers have embedded NTI in four different locations within the instructional sequence (a) antecedent (Daughtery, Grisham-Brown, & Hemmeter, 2001; Falkenstine, Collins, Schuster, & Kleinert, 2009), (b) task direction (Doyle, Schuster, & Meyer, 1996; Roark, Collins, Hemmeter, & Kleinert, 2002), (c) prompt hierarchy (Doyle, Gast, Wolery, Ault, & Meyer, 1992; Fiscus, Schuster, Morse, & Collins, 2002), and (d) consequent event (Gast, & Doyle, 1991; Jones, & Collins, 1997).

Non-target Information in the Antecedent

Many studies on the topic of NTI focus on placing it in the consequent event of a targeted behavior (Falkenstine et al., 2009); however, there have been many studies that also have shown that participants learned NTI placed in the antecedent event with the same success rate as in consequent event studies. For example, Keel and Gast (1992) examined whether three fifth graders with learning disabilities acquired nine sight words directly while embedding their spelling in the antecedent event. The authors asked participants to correctly copy the word and, once the word
was copied correctly, the authors provided the Sd (i.e., “What word?”). Additionally, Keel and Gast used a multiple probe design to assess the efficiency and effectiveness of embedding NTI in the antecedent and found that although the acquisition of spelling was low, two participants made significant gains in learning the spelling of both target and observational words. Gast and Doyle (1991) using a pretest, posttest procedure also found, when the teacher modeled the spelling as part of the antecedent event, participants partially acquired incidental information through observation learning in a small group format. Within this study, Gast and Doyle also compared the acquisition of incidental information for spellings that were presented in the antecedent versus the consequent event. They found “although acquisition of correct spelling of the target words was greater for words spelled in the antecedent condition, correct spelling of words from the consequent and no spelling conditions increased in the final posttest” (p. 8).

Non-target Information in the Task Direction

The second location to embed NTI is the task direction (Sd). Only two studies have examined embedding NTI within the Sd (Doyle et al., 1996; Roark et al., 2002). Doyle et al. taught four participants with moderate to severe disabilities to identify 12 grocery items using the progressive time delay strategy (PTD). The researchers embedded the department in which each food was found within the Sd and participants also were exposed to the department in the grocery store in which each food could be found during community based instruction (CBI). They used a multiple probe design across behaviors and participants to assess acquisition of the grocery item and a pretest/posttest format to assess the acquisition of NTI. During the probe sessions, the researchers showed each participant a grocery item and asked the participant to hand a specific food to the researcher (e.g., “Give me the dairy food”).

Results indicated one participant learned to identify the NTI of the grocery department in both receptive and expressive tests conducted within the classroom. Another participant learned to identify target food items found in both the meat and dairy departments expressively and receptively. The other two participants correctly responded to food found only in the meat department. Upon comparing their study to research pertaining to embedding NTI in the antecedent and consequent events, they found that their participants learned the embedded NTI with the same or greater accuracy of previous findings.

Roark et al. (2002) used CTD to teach four secondary participants to receptively identify packaged food items while embedding NTI, manual sign language, in the Sd. They used a multiple probe across behaviors design replicated across subjects to assess the effectiveness of the CTD procedure and a pretest/posttest procedure to assess acquisition of NTI. During pretest conditions, none of the participants accurately identified NTI stimuli and during the final probe session, participants identified an average of 60% of sign language. The authors noted future research should investigate systematic replications of the study using a small group format as opposed to a one on one approach.

Non-target Information in the Prompt Hierarchy

Along with embedding NTI in the Sd, embedding NTI in the prompt hierarchy is another location without a large research base. An ERIC search produced few studies in which researchers addressed this location. Doyle et al. (1992) taught four elementary school participants with moderate disabilities to read food words found on restaurant menus using the system of least prompts (SLP) response prompting procedure. While participants received instruction on individual sets (each set contained 2 words), the researchers exposed participants to the NTI in the prompt hierarchy. The prompt hierarchy consisted of five levels which included: (1) task direction alone; (2) task direction paired with verbal prompt indicating cost of the item (i.e., “What word?” “It costs more [or less] than a dollar.”); (3) task direction paired with a verbal prompt labeling the meal when the target food was consumed (i.e., “What word?” “We eat it for dinner [or breakfast].”); (4) task direction in addition to a visual prompt showing a picture of the target food (i.e., “What word?” picture); and (5), the task direction paired with a verbal
model of the correct response (i.e., “What word?” “Food name.”) (p. 240). Results showed that the participants classified some of the target words and stated at what meal the food was typically consumed.

In another study, Fiscus et al. (2002) taught four elementary participants to make waffles, cheese with crackers, and chocolate milk using the CTD procedure. Related NTI embedded in the prompt included expressive and receptive identification of the words and sentences found with each step of the recipe book and non-related NTI included names of kitchen utensils. The primary trainer developed the sentences and pointed to each word as she issued the task direction. Results indicated all of the participants except one learned some of the sentences and the words contained in those sentences, along with the non-related NTI delivered in the consequence.

Non-target Information in the Consequent Event

The most common place within the instructional trial to embed NTI is in the consequent event. Often called instructive feedback, this information most often is delivered after some kind of reinforcer (e.g., verbal praise). Researchers have conducted many studies to assess acquisition of NTI in this location (Doyle & Gast, 1990; Gast & Doyle, 1991; Wolery et al., 1991).

For example, Jones and Collins (1997) taught three female adults three microwave cooking skills using SLP procedures. The researchers embedded NTI of nutritional and safety facts into the prompt hierarchy and the consequent event. According to their results, all the participants in the study acquired all three skills in an average of 8.1 sessions and two participants generalized the skills to their home setting, maintaining the skills over time. The researchers reported that the participants acquired a range of 83–100% of the NTI when the researchers embedded within the prompt hierarchy and 100% acquisition when NTI was included in instructive feedback.

In 1993, Wolery, Holcombe, Werts, and Cipolloni studied the effectiveness of SP and the effects of embedding NTI in the consequent event while teaching five preschool children with developmental delays to receptively identify rebus symbols using a simultaneous prompting (SP) procedure. The NTI included information to classify each symbol. Classification of NTI included whether you could eat or drink the food stimulus and whether it was served for lunch or breakfast. Six symbols were broken into three sets of two symbols. The authors used a multiple probe design. During the final probe of the NTI, two participants classified all target symbols. One participant did not respond during the classification probe sessions and the other participants increased their accuracy in classifying target symbols with variable results.

Gursel, Tekin-Iftar, and Bozkurt (2006) conducted a multiple probe study using SP to teach five middle school participants (three females, two males) with significant disabilities the rivers, providences, and bordering countries of Turkey as well as mathematical symbols, all evidenced in grade level core content, through observational learning and instructive feedback. In addition to measuring the effectiveness of SP, the researchers also measured NTI delivered as instructive feedback and observational learning. Gursel et al. also conducted maintenance and generalization across persons and materials probes.

During the study, the researchers did not correct participant errors and reinforce correct participant responses during probe sessions with descriptive verbal praise embedding the NTI (e.g., “Goksu flows into Aegean Sea”). Results showed that using SP to teach a heterogeneous group of participants was effective and participants maintained the targeted material in maintenance sessions conducted two and six weeks following instruction. Additionally, all participants except for one maintained criterion based performance across generalization probes. The researchers also found that all of the participants acquired at least some of the instructive feedback ranging anywhere from 33–100%. Participants did acquire some of the information through observational learning again ranging in the final probe session between 33–100%. The researchers suggested that future studies continue to look at using SP to teach information in a small learning group, different group contingencies, and different types of participant responses (i.e., choral).

In 2009, Falkenstine et al. also studied in-
structive feedback and observational learning in a small group teaching arrangement. In this study, the researchers used CTD to teach three participants with moderate disabilities discrete and chained tasks as targeted stimuli. During instructional trials, the researcher presented the participant with the targeted stimuli of a sight word. Following the participant’s response, the teacher provided verbal instructive feedback, the discrete NTI (e.g., "capital of Indiana is Indianapolis") and the chained task non-target information (e.g., spelling the state). NTI varied for each participant and was based on their IEP goals. Faulkenstine et al. assessed maintenance and generalization of the skills for a month following instruction. The researcher assessed participant performance across a variety of materials (e.g., a wrist watch versus a digital clock).

Not only did the results show that CTD was effective in the acquisition of the targeted stimuli but that participants made increases in both discrete and chained NTI stimuli. The researchers report an average of 82.2% acquisition through observational learning of participants’ targeted stimuli. Additionally, participants’ acquired a mean of 78.1% of discrete task and 77.4% of chained task NTI.

A strong research basis focused on the effectiveness of response prompting and other instructional procedures exists. Simultaneous prompting is one response prompting strategy that is successful in teaching a variety of chained and discrete tasks to a variety of participants with disabilities (Morse & Schuster, 2000). Past studies have demonstrated its effectiveness in teaching both chain and discrete tasks ranging from making concentrate juice (Schuster & Griffen, 1993) to sight words (Schuster, Griffen, & Wolery, 1992). In addition to measuring the effectiveness of SP, Schuster et al. (1992) compared SP to CTD finding SP effective in teaching two male and two female elementary school age participants sight words. Unlike time delay procedures, during training, SP requires the instructor to provide the controlling prompt immediately following the Sd. Due to this protocol, opportunities for participant error are low, thus making it participant friendly. In addition, because of the minimal teacher preparation time and the duration of probe and training sessions, SP is a fast, yet effective procedure for acquisition of new material.

Another area of focus for educators is increasing the efficiency of instruction in addition to the effectiveness. Efficient teaching allows participants to learn more information in the same amount of time and freeing time to teach other skills. Efficient teaching practices require less teacher time, less material development, and strategies that are easier to implement. One way to increase teacher efficiency is by embedding incidental information or NTI within the instructional trial (Keel & Gast, 1992).

The literature provides an evidentiary basis that participants learned related and non-related NTI when researchers embed it within the instructional trial. Additionally, research that embeds NTI in the antecedent and consequent events within an instructional trial outweigh those studies examining embedded NTI within the Sd or prompt hierarchy. Furthermore, the literature that does examine embedded NTI is limited in terms of replication as well as participants. None of the prior research includes secondary school aged participants. The purpose of this study was to (a) examine the effect using the SP strategy to teach four high school participants with disabilities to expressively recognize sight words, (b) determine if participants will maintain the acquired sight words, (c) evaluate if participants will generalize the acquired sight words, and (d) evaluate to what extent does embedding NTI in the discriminative stimulus teach participants to acquire, maintain, and generalize the NTI.

Method

Participants

The first author operated as the primary investigator and implemented this instructional program with four participants with moderate to severe disabilities in the school resource room. David was a 15 year, 4 month old male with a functional mental disability. He had no other medical diagnoses and did not have a history of health problems. David spent three out of seven periods in a general education setting. His last evaluation revealed a Scales of Independent Behavior-Revised (SIB-R) (Har-
Overall adaptive behavior scale score of 50, falling in the limited range of scores obtained by same aged peers. All areas of the rating scale fell within the limited or very limited range. Additionally, the evaluation reported a Wechsler Intelligence Scale for Children (WISC-IV) (Wechsler, 2003) IQ score of 48 and correspondingly low scores on the Woodcock-Johnson III Test of Achievement (WJ III) (Woodcock, McGrew, & Mather, 2001). His strengths included completing mathematical equations with the assistance of a calculator and his motivation to read. Current IEP goals included making sense of a variety of material he reads.

Ellen was an 18 year, 2 month old female. It was her first year at the high school and she received special education services under the Other Heath Impairment (OHI) and moderate mental disability (MMD) classifications. In addition to a cognitive mental disability, Ellen also had Type I Diabetes and a seizure disorder. She checked her own blood levels periodically throughout the school day. She was in the regular education setting for more than 80% of the school day. According to her IEP, Ellen had difficulty with vowel sounds, blends, and decoding. She wrote using complete sentences and used a calculator to complete mathematical calculations. She often had difficulty concentrating on academic tasks; often resulting in her quitting. Her IEP included goals pertaining to socially acceptable manners and using coping skills during conflict, increasing sight word recognition, increasing reading comprehension, and writing in paragraph form. Her last evaluation reported a SIB-R (Harrison & Oakland, 1996) score of 67, which fell within a limited range, and a WISC-IV (Wechsler, 2003) IQ score of 67.

Todd was a 19 year, 1 month old male. He received special education services under the diagnosis of a functional mental disability; in addition, he also had a seizure disorder. According to his IEP, Todd’s vision, hearing, and communication skills were commensurate with his same age peers. His goals included increasing reading comprehension skills, specifically text in paragraph form and in advertisements, and sight word recognition skills. Other goals included writing a check and making change. The IEP reported that Todd has a pleasant demeanor and is motivated to learn. He often sought approval for actions that have led to some social problematic behavior. Examination of his due process file revealed a WISC-III (Wechsler, 2003) IQ score of 65 and a SIB-R (Harrison & Oakland, 1996) composite score of 66 with strengths in the areas of daily living, communication, and socialization.

Jerry was a 16 year, 6 month old male. Jerry’s medical records indicated that he was born prematurely with a high grade fever. As a result of medical complications, Jerry remained at the local hospital’s intensive care nursery for 2 months following his birth. According to Jerry’s IEP, he read at a first grade level and had reading comprehension skills comparable to a fourth or fifth grade level. The areas of communication, vision, and hearing were commensurate to his same aged peers. It also reports that Jerry was “a good problem solver.” In addition to a cognitive mental disability, Jerry was also diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). He took Adderall to address symptoms of the condition. Jerry had a network of friends and participates in both Special Olympics and the schools’ ROTC program. Current IEP goals included using next dollar strategy, counting coins, reciting and writing personal information, and making sense of variety of materials read. His last evaluation reported an IQ full scale score of 55. Adaptive behavior scales reported that overall, he fell in the mild deficit range with high scores in the areas of communication, daily living, and socialization.

Others. The first author acted as the primary implementer of the study. She conducted this study as part of a Masters degree program. In addition to the first author, the classroom teacher was present to collect reliability data and conduct some generalization probes. The classroom teacher had taught in the school district for 5 years, was a current masters student, and had conducted her own research using single subject research measures. Her classroom had welcomed past graduate students conducting research studies and was familiar with all research protocol and instructional procedures.
Prerequisite Skills

Prerequisite skills for the participants included visual and auditory acuity, verbal imitation, the ability to make a choice, and fine motor control. The first author observed all prerequisite skills in the resource room during instruction or in the school’s cafeteria during lunch.

Instructional Setting and Arrangement

During all baseline, training, maintenance, and generalization sessions, the researcher sat facing the student at a small instructional table in the classroom. When the classroom teacher collected reliability data, she sat behind the student. All sessions took place in the resource room. Sessions occurred Monday through Friday between 11:30 a.m. and 12:30 p.m. in a one to one format. During sessions, six other students, two instructional assistants, and two peer tutors were present in the room. In order to control for distractions, the participants faced away from all other peers and students present, only facing the researcher and the wall behind the researcher.

Materials and Equipment

Materials necessary used to implement this program included a timer, three sets of four 3 × 5 in index cards with the targeted stimuli printed on one side and the corresponding food category on the other, data sheets for screening, probe, training, maintenance, and generalization sessions, as well as reliability, and pre-test/post-test activity sheets for NTI data collection.

Data Collection

During this study, the researcher used a discrete trial data collection method to record each student’s initial response during all sessions. Throughout the study, there were three possible student responses: unprompted correct, unprompted error, and no response. The researcher defined an unprompted correct response as the student identifying the word accurately within 3 s of the Sd, an unprompted error as the student inaccurately identifying the word within 3 s of the Sd, and no response as the student not responding within 3 s of the Sd. For all unprompted correct, the researcher recorded a “+”, for unprompted error “−”, and for no response “0”.

General Procedure

The purpose of the study was to teach four participants with disabilities to identify 12 restaurant words and classify those foods (i.e., beverage, entrée, dessert, and appetizer). The researcher used the SP procedure as the independent variable in the program and a multiple probe across behaviors and replicated across participants experimental design. The researcher embedded the food’s classification within the Sd (e.g., “What appetizer?”). The study began with screening sessions following with three full probe sessions. Following full probe sessions, the researcher implemented a daily probe session following with a training session five days a week, two sessions per day. Once participants met criterion on one set of words, the researcher probed the next set, conducted a NTI probe, and continued the outlined process for all remaining sets.

Screening Procedures

The researcher chose this skill based on a philosophy of promoting independence in community settings, current IEP goals, and the community surrounding the high school. The researcher conducted one screening session for all the participants in which only the researcher and the student were present in the classroom. During the session, the researcher asked each student to verbally identify the word printed on the card. Screening stimuli included 40 words taken from menus in area restaurants (Applebee’s, Corky’s, and Olive Garden) and NTI (i.e., entrée, beverage, appetizer, and dessert), presented in random order once.

During the session, the participants had 3 s to expressively identify the word following the Sd (e.g., spinach dip). Possible student responses included (a) correct, student identified the word within 3 s of the Sd; (b) error, student identified the word within 3 s of the Sd, but the identification was incorrect; and (c) no response, student did not respond within 3 s of the Sd. The researcher used an
inter trial interval (ITI) of 5 s and reinforced participation on the average of every fifth trial (i.e., a VR 5 schedule). The researcher did not reinforce participants for any correct, incorrect, or no responses. The procedure for a screening trial included (a) presenting the sight words printed on a 3 × 5 in. index card with index cards labeled appetizer, entrée, beverage, and dessert, (b) asking each student “What kind of food is this?”, (c) reading aloud each of the choices while pointing to the corresponding index card (i.e., appetizer, entrée, beverage, and dessert), and (d) recording student response. Based on the screening data collected, the researcher narrowed down stimuli to include during intervention to three sets of four stimuli for a total of 12 stimuli. The researcher selected one word from each category for each set; these are reported in Table 1.

Probe Procedures

**Full probe sessions.** The researcher conducted a minimum of three full probe sessions between 11:30 a.m. and 12:30 p.m. before instruction and once a student met criterion on a set of words, in a one to one format. The researcher presented 12 stimuli in random order for a total of 12 trials per session and an ITI of 5 s.

Once at the table, the researcher secured the student’s attention by verbally stating expectations for the task (i.e., “I am going to ask you to read some words. If you know the word then I would like you to say it. If you do not know the answer, that’s OK.” We will learn the words later”). The researcher presented the food category side of the index card(s) while delivering the Sd of “What _____?” She flipped the card over to reveal the targeted stimuli to the student and waited 3 s for the student to respond. The researcher recorded the student’s response according to the response definitions previously described and continued for all 12 stimuli. The researcher reinforced for participation on a VR 4 schedule and at the end of the session. She did not provide verbal reinforcement for a correct response.

**Daily probe sessions.** The researcher conducted daily probe sessions immediately prior to training sessions. She probed the set of words currently being trained, presenting each stimulus twice randomly for a total of eight trials. The researcher used procedures identical to full probe sessions. A student reached criterion once he or she identified the words with 100% accuracy for three out of four consecutive sessions. During daily probe sessions, the researcher reinforced participants for all correct responses and ignored all student errors or no responses.

**Non-target information.** Following the screening sessions for sight word identification and prior to any probe or training sessions, the researcher screened each student for prior NTI knowledge. She began by pointing and reading aloud the card placed on the table identifying the four food categories. Then the researcher showed each student one of the sight words written on 3 × 5 in index cards and asked, “What kind of food is this?,” and reread the possible student responses. Participants responded either expressively by stating the food category or receptively by pointing to the index card in which the food category was printed. The researcher collected data using the same response definitions described in probe conditions. Following every third full probe session, the researcher presented the same cards and task to collect data on their progress for classifying the foods correctly.

**Training Procedures**

The researcher implemented the SP procedure during training sessions and conducted training sessions immediately following daily probe sessions Monday through Friday from 11:30 a.m. and 12:30 p.m. The researcher
used the same instructional setting and arrangement throughout the program.

Training began with a general verbal task direction, for example, “Now we are going to practice the words. Repeat after me.” The researcher presented the food category side of the index card, delivered the Sd while flipping the card over to reveal the targeted sight word, and immediately delivered the controlling prompt (e.g., “The word is spinach dip”). If a student did not respond correctly (repeat the word within 3 s of the controlling prompt), the researcher ignored the response and continued with the next trial. If a student did respond correctly, the researcher provided a praise statement. Each stimulus was presented twice for a total of eight trials. The researcher reinforced the participants for all prompted correct responses and at the end of the session, provided a general praise statement and the student returned to working with a peer or the instructional assistant.

**Maintenance Procedures**

The researcher embedded maintenance of the skills into the program via full probe sessions as prescribed by the multiple probe design. She conducted full probe sessions to assess maintenance 1 and 3 weeks following criterion on all sets. All maintenance sessions were conducted the same as full probe sessions. The researcher also conducted maintenance sessions on NTI on the same schedule as the target stimuli. During these sessions, the researcher rewarded participants for making correct responses as defined above in full probe sessions.

**Generalization Procedures**

**Target.** Generalization probes were conducted using menus from the designated restaurants with the categories labeled. The researcher prompted the participants to “Show me ________”, and collected data on whether or not the student accurately pointed to the food on the menu. Participants were verbally reinforced at the end of the session.

**NTI.** To conduct generalization probes on the NTI, the researcher used the same menu from the target generalization probes, but instead of asking the student to find the food item on the menu she asked the participants to point to the category in which the food item was found (entrée, dessert, appetizer, and beverage). The same procedures as outlined in the target generalization probes were used. The researcher also reinforced at the end of the session.

**Experimental Design**

The researcher used a multiple probe across behaviors and replicated across participants experimental design. She controlled for threats to internal validity by systematically collecting reliability data on both the dependent and independent variables and using those data to assess any unexpected variance in data (e.g., during a full probe session a student makes progress in acquiring set 3 when he or she had not received training on set 3). Using the visual analysis, the researcher assessed internal threats to validity such as history or experimental effects. The multiple probe design promotes control for testing and maturation due to the short time span in which the study was conducted.

**Reliability**

**Dependent variable reliability.** To calculate dependent variable reliability, the researcher used the point-by-point method; dividing the number of observed behaviors by the number of planned behaviors and multiplying by 100 (Tawney & Gast, 1984). The classroom teacher collected reliability data during every fourth daily or full probe session.

**Independent variable reliability.** To calculate independent variable reliability, the researcher divided the number of observed behaviors by the number of planned behaviors and multiplied by 100 (Billinsley, White, & Munson, 1980). Teacher behaviors measured included, when appropriate: (a) having materials ready, (b) securing student attention, (c) presenting card, (d) deliver Sd, (e) delivering NTI, (f) waiting 3 s, (g) maintaining between a 3 and 5 s inter-trial interval before presenting the next card, and (h) delivering appropriate consequences.

The classroom teacher collected reliability data during every fourth daily or full probe session. The classroom teacher collected reli-
ability data on 39 of the 138 experimental sessions (28%) across conditions on both the dependent and independent variables, including 45% of full probe sessions and 18% of daily probes. The mean procedural and interobserver reliability during all probes of the study was 100%. The researcher did not collect reliability data during training sessions.

Results

Effectiveness Data

Figures 1, 2, 3, and 4 represent percentages of correct responses during full and daily probe sessions across all sets for David, Ellen, Todd, and Jerry. Participants made no errors during training sessions. Table 2 includes effectiveness data pertaining to number of sessions to criterion, number/percent of probe errors, and instructional time to criterion level performance. The session instructional time totals include all full and daily probe sessions. The average number of sessions to criterion on Set 1 was 7.5 (range 4–11), Set 2, 6.75 (range 5–10), and Set 3, 6 (range 5–9).

David reached criterion based performance on Set 1 in 4 daily probe sessions, Set 2 in 5 sessions, and Set 3 in 5 sessions. During those sessions, he made four errors during probe session on Set 1, in Set 2 five errors, and in Set 3 a total of seven errors. Ellen reached criterion based performance on Set 1 in 5 daily probe sessions, Set 2 in 6 sessions, and Set 3 in 5 sessions. She made no errors in both Sets 1 and 2 and three errors in Set 3 during daily probe sessions. Todd reached criterion based performance on Set 1 in 10 daily probe sessions, Set 2 in 6 sessions, and Set 3 in 5 sessions. During daily probe sessions, he made 14 errors during Set 1, five errors during Set 2, and two errors during Set 3. Jerry reached criterion based performance in 11 sessions for Set 1, 10 sessions for Set 2, and 10 sessions for Set 3. During those sessions, he made one error during Set 1, four errors during Set 2, and no errors during Set 3.

For most sets, students correct responding remained at 0% for all targeted behaviors. However, there were two exceptions. Two students, David and Jerry, ate at one of the designated restaurants during intervention phase and ordered targeted items from the menu. Following those correct responses, the researcher contacted each student’s parent and explained the effect on the study. Both parents agreed to refrain from eating at any of the designated restaurants for the duration of the study.

After training, David and Ellen both maintained criterion level performance for all remaining full probe sessions. Table 3 includes student performance data during maintenance and generalization sessions. Todd incorrectly responded to one targeted word during Probe IV and Jerry incorrectly responded to four stimuli in Probe IV. Both students made errors in the correct pronunciation of the targeted word. Specifically students struggled with the pronunciation of the words tiramisu and calamari. During maintenance and generalization probes, Ellen and David remained at criterion level performance. Todd incorrectly identified three words and Jerry incorrectly identified four words. During maintenance probes (Probes V and VI) both students made errors in the correct pronunciation of the word. During the generalization probe (Probe VII), both Todd and Jerry made errors by pointing to a word on the menu starting with the same letter as the target word following the Sd.

The researcher also assessed the acquisition of NTI during the study. Table 4 reflects percentage of correct responses during NTI probes including maintenance and generalization probes. All students responded correctly to 0% of the NTI before instruction. Following all training probes, Ellen correctly identified all NTI information across materials and categories. David learned NTI stimuli; however, he consistently gave an incorrect response to the targeted sight word strawberry coco frost smoothie. Todd and Jerry also made similar errors classifying the beverage as a dessert. Additional errors made by Todd and Jerry were a result of confusing food selections that were appetizers as entrees. In addition, immediately following Todd’s third probe session and before Jerry’s third probe session, Todd had a seizure that required clearance of the classroom. The researcher resumed Jerry’s probe after Todd had recovered, but during the session, Jerry was notably distracted and did make errors not repeated in any other NTI probe session. Todd correspondingly...
Figure 1. Percentage of Correct Responses during Probe Sessions for David.
Figure 2. Percentage of Correct Responses during Probe Sessions for Ellen.
Figure 3. Percentage of Correct Responses during Probe Sessions for Todd.
Figure 4. Percentage of Correct Responses during Probe Sessions for Jerry.
made errors that he did not repeat during other NTI probe sessions as well. Overall, all students made a significant gains in acquisition of NTI.

### TABLE 2

**Effectiveness Data**

<table>
<thead>
<tr>
<th>Students</th>
<th>Set</th>
<th>Number of Sessions</th>
<th>Number/Percent of Daily Probe Errors</th>
<th>Instructional Time to Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>David</td>
<td>1</td>
<td>4</td>
<td>4/12.5%</td>
<td>6 m 23 s</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td>5/12.5%</td>
<td>6 m 49 s</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5</td>
<td>7/17.5%</td>
<td>7 m 1 s</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>16/14.3%</td>
<td>20 m 13 s</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.7</td>
<td>5.3/14.2%</td>
<td>6 m 45 s</td>
<td></td>
</tr>
<tr>
<td>Ellen</td>
<td>1</td>
<td>5</td>
<td>0/0 %</td>
<td>6 m 3 s</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>0/0 %</td>
<td>6 m 20 s</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5</td>
<td>3/7.5 %</td>
<td>5 m 49 s</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>3/2.3%</td>
<td>18 m 12 s</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.3</td>
<td>1/2.5%</td>
<td>6 m 4 s</td>
<td></td>
</tr>
<tr>
<td>Todd</td>
<td>1</td>
<td>10</td>
<td>14/17.5%</td>
<td>8 m 55 s</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>5/10.4%</td>
<td>7 m 32 s</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5</td>
<td>2/5 %</td>
<td>6 m 45 s</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>21/12.5%</td>
<td>23 m 12 s</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7</td>
<td>7/11 %</td>
<td>7 m 44 s</td>
<td></td>
</tr>
<tr>
<td>Jerry</td>
<td>1</td>
<td>11</td>
<td>1/1.1 %</td>
<td>9 m 26 s</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>10</td>
<td>4/5 %</td>
<td>8 m 55 s</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10</td>
<td>0/0 %</td>
<td>8 m 4 s</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>5/2 %</td>
<td>26 m 25 s</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.3</td>
<td>1.7/2%</td>
<td>10 m 25 s</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>82</td>
<td>45/6.9%</td>
<td>88 m 2 s</td>
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</tbody>
</table>

### TABLE 3

**Maintenance and Generalization Data**

<table>
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<tr>
<th>Student</th>
<th>Set</th>
<th>Probe V</th>
<th>Probe VI</th>
<th>Probe VII</th>
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<tr>
<td>David</td>
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<td>100%</td>
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<td>100%</td>
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<tr>
<td>Ellen</td>
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<td>100%</td>
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<td>100%</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Todd</td>
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<td>100%</td>
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<td></td>
<td>3</td>
<td>100%</td>
<td>100%</td>
<td>75%</td>
</tr>
<tr>
<td>Jerry</td>
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<td>75%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
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<td>75%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Discussion

Simultaneous prompting procedures were effective in teaching students expressive identification of food items from local restaurants’ menus. Students also successfully learned the NTI of classification of those food items. Like past research studies, the researcher found SP both teacher and student friendly. Most of the participants had a history using the procedure in the classroom and would often ask prior to a session, “Is this the one where I guess or just repeat after you?” Being a novice instructor to the school, the familiarity of the instructional procedure increased the researcher’s ability to provide a comfortable environment for the participants. Participants were motivated to acquire the targeted sight words and would approach the researcher after lunch so they could “help” her with the study.

The only procedural modification the researcher made during implementation of the study was decreasing the timeline between maintenance and generalization probes. Due to relocation out of state, a classroom teacher
conducted Todd and Jerry’s maintenance and generalization probe sessions. During those sessions, another classroom teacher collected reliability data. The researcher communicated daily with the classroom teacher in both reporting results and instructing her as to which sessions to conduct the following day. Limitations of this study include the short amount of time in which some sessions of daily probes were conducted due to student attendance and schedules and lack of implementation within community based location.

Any future replications should include three changes: (a) informing parents of potential risks to validity if they visit/utilize community setting which are included in the studies (i.e., not going to the restaurants included in the study) in the parental permission letter, (b) selecting NTI stimuli that are not easily confused when classified (i.e., is a frostie a dessert or beverage) and (c) addition of a parent/student survey to evaluate if in future visits to the designated restaurants the students were able to use these acquired skills to order independently from the menu.

This study, in addition to Doyle et al. (1996) and Roark et al. (2002) provides further evidence that embedding NTI in the task direction is an effective means to increase educational efficiency. One significant difference between previous studies and the current study was the choice of response prompting procedure implemented. In both the Doyle et al. and Roark et al. studies, researchers used time delay procedures specifically constant time delay (CTD) and progressive time delay (PTD). Both studies reported wait errors participants made during the implementation phase. Doyle et al. reported 24 unprompted errors and Roark et al. reported 40 errors in which 29 were unprompted errors. The use of SP in this study prevented the possibility of participant wait errors.

Another difference between the previous research and this study was the use of high school aged students. These differences address some boundaries of the previous studies explained by Birnbrauer in 1981, thus enhancing their external validity. However, further systematic replications of these single subject design studies across multiple locations and researchers are still needed.

Specifically, future studies should conduct generalization probes in the community setting (i.e., the restaurant) to assess whether true generalization across materials and settings occurred. Additionally, future studies should examine the use of SP and embedded NTI in the Sd when teaching skills more aligned with grade level academic core content.

**References**


Birnbrauer, J. S. (1981). External validity and exper-


