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Comparing Prompting Methods for Teaching Receptive Identification

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Abstract

Receptive language is the occurrence of an appropriate response to the spoken language of another individual. This is a key element of development, especially in regard to the acquisition of spoken language (Grow & LeBlanc, 2013). While this appropriate responding is a skill generally acquired by typically developing children via interactions with their caregivers, in most situations it must be explicitly taught to children with developmental delays (Charlotte L. Carp, Sean P. Peterson, Amber J. Arkel, & Anna I. Petursdottir, 2012). An absence or delay of this skill will result in a child missing many important learning opportunities, leading to further delays in overall development. The goal of the present study was to teach receptive identification, a key part of receptive language, to a 3-year-old female with developmental delays. An Alternating Treatments Design (ATD) with three conditions was used to teach this skill. These conditions included an Antecedent Picture Prompt (APP), a Consequence Picture Prompt (CPP), and a Least-to-Most Physical Prompt (LTM) which were rotated randomly each session. The participant was required to reach at least an 88% for correct identification for three of five consecutive sessions in order to meet mastery criterion. It was expected that this procedure would result in an acquisition of the receptive identification skill for the presented stimuli which would aid the participant in acquiring more advanced receptive skills later on.

Introduction

Receptive language is the transpiring of an appropriate response to the spoken language of others. Through their caregivers, children are exposed daily to hundreds of learning opportunities relating to receptive language skills. An example of this may be an utterance as simple as “pass me the salt”. While typically developing children quickly learn to respond to these stimuli, ranging from their name to the identification of a variety of events and stimuli within their environment, children with developmental delays, including autism spectrum disorder (ASD), customarily do not. For these children, specific and carefully designed environments must be created in order for them to learn how to respond efficaciously to the language of other individuals (Grow & LeBlanc, 2013).

The importance of designing these specified scenarios is amplified by the significance of receptive language itself, as it is a key building block of verbal language acquisition among other developmental milestones (Grow & LeBlanc, 2013). Difficulties in learning this skill will lead to struggles with communication and will in turn affect overall cognitive and social development as well as likely producing problem behaviors (Onur, 2011). Thus, finding the most efficient and effective method for teaching receptive language is of the utmost importance. One of the explored methods is the use of prompting, and more specifically the use of picture prompting in cultivating receptive identification; a key skill in the category of receptive language alongside skills such as direction following.

A study by Charlotte L. Carp, Sean P. Peterson, Amber J. Arkel, and Anna I. Petursdottir (2012) explored the use of picture prompting in order to teach auditory-visual conditional discrimination. Their participants included four children diagnosed with ASD – one female, three

males – ranging in age from 3 years 9 months old, to 4 years 8 months old. The researchers began with a pretest in order to identify 12 sample stimuli not already in the participants' repertoires, and the identified 12 were then split randomly in groups of four, into three different experimental conditions. These conditions included a picture prompt, a pointing prompt, and a control condition. The control condition consisted of trial-and-error for two of the four participants and no-reinforcement for the remaining two. This was done because the latter pair of participants had existing repertoires involving visual conditional discrimination, which may have interfered with the ability of the trial-and-error condition to control for procurement outside of the study.

Using an adapted form of an alternating treatments design, the three assigned conditions were randomized and run until either mastery criteria were met for one or more conditions with stable data in the remaining, or until data were stable across all conditions and there was a clear visual separation between each. In order to reach these criteria, the original three conditions had to be altered for two participants, nonetheless it was found that the picture prompting condition was the most effective for rapid skill acquisition in all four participants (Carp et al., 2012).

In light of these findings, the current study serves to replicate the use of picture prompts in comparison with alternative methods in teaching receptive identification to a preschool-age child with developmental delays. As the Carp et al. (2012) study modeled, three different conditions were included in the present study; an Antecedent Picture Prompt (APP) condition a Consequence Picture Prompt (CPP) condition, and a Least-to-Most Physical Prompt (LTM) condition. The APP condition is a modified version of Carp et al.'s picture prompt condition, based on the alterations made for the two participants mentioned above in the Carp et al. (2012) study. Also varying from the original, sessions were conducted an average of two times per day,

2 – 4 days a week as opposed to the 2 – 3 days a week in the Carp et al. study. However, the requirements for reaching mastery criterion were similar in that a score of at least 88% must be reached for 3 of 5 consecutive sessions. With the modified picture prompt conditions, it was expected that this procedure would result in the acquisition of receptive identification skills for the given stimuli which would aid the participant in amassing more advanced receptive language skills moving forward.

Methods

Participants and Setting

The current study was conducted in an Early Childhood Special Education classroom at the Kalamazoo Regional Educational Service Agency's (KRESA) West Campus. Two to four sessions consisting of 3 conditions each were conducted weekly, Monday through Friday. Trials occurred both at a small table in an individual booth within the classroom, and at a table in a communal hallway to promote generalization and to provide access to highly preferred reinforcers which were not available in the booth setting.

The participant was a 3-year-old female who had been previously diagnosed with a developmental delay. At the time of this study the participant had been in the special education program for under 1 year and had an advanced matching repertoire which was present prior to beginning trials. The participant was ideal as many of her attributes including age were comparable to those of other children in the program, and she had not made progress with the classroom receptive identification procedure.

Materials

The materials used in this study included a stimulus board with four hook and loop attachments, 12 cards with different visual comparison stimuli and hook and loop attachments, 32 picture cards without hook and loop attachments (8 at 100% opacity, and 4 at 10%, 5%, 4%, 3%, 2%, and 1% respectively), data sheets with three conditions in a randomized order, various tangible reinforcers selected by the participant, and edible reinforcers including Skittles, M&M's, and Doritos.

Research Design

An alternating-treatments design consisting of three conditions; Antecedent Picture Prompt (APP), Consequence Picture Prompt (CPP), and Least-to-Most Physical Prompt (LTM), was used for this procedure. The APP condition involved multiple stimulus fading phases along with within-session fading after the participant reached mastery criterion for the first phase and a probe was conducted to test for mastery.

Procedure

Each set of sessions consisted of all three conditions in a pre-determined random order. All sessions were 16 trials in length, with each of the 4 targets being presented a total of four times per condition. In each condition the participant was required to select the comparison stimulus that matched the given auditory stimulus by pulling the correct comparison stimulus off the board and handing it to the experimenter independently. If no response occurred during a trial the auditory stimulus was presented three times prior to moving into error correction for each

condition. If an incorrect response occurred the experimenter immediately moved into each condition's respective error correction method.

In the APP condition, 4 hook and loop comparison stimuli (Ball, Chair, Juice, and Spoon) were presented on the stimulus board and were followed by an auditory stimulus (labeling the target) as well as a full color matching picture prompt. If no response, or an incorrect response occurred the stimulus was followed first by a gestural, then a full physical prompt.

Once mastery criterion was reached with the full color picture prompt in the APP condition, a probe was conducted, and stimulus fading was introduced if the participant selected less than 88% or 14 of 16 presented stimuli correctly during the probe. During stimulus fading the matching picture prompt was faded initially to 10% opacity, and was lowered to 5%, 4%, 3%, 2%, and 1% respectively upon either reaching mastery criterion for each level, or when the first 8 trials of a session were 100% correct. As in the initial phase of the APP condition, if no response, or an incorrect response occurred the picture stimulus was followed by a gestural, then a full physical prompt.

In the CPP condition 4 hook and loop comparison stimuli (Truck, Cup, Boots, and Phone) were presented on the stimulus board and were followed by the auditory stimulus. If no response or an incorrect response occurred, the auditory stimulus was re-presented with the full color picture prompt; if still unsuccessful a full physical prompt would be used.

For the LTM condition 4 hook and loop comparison stimuli (Coat, Pen, Milk, and Bus) were presented on the stimulus board and an auditory stimulus was presented. If no response, or an incorrect response occurred, a gestural, then full physical prompt was used to help the participant to select the correct stimulus.

Differential reinforcement was used in each condition. When the correct stimulus was selected the participant gained access to a highly preferred tangible as well as an edible reinforcer. In the case that error correction did occur, the trial was ended and followed by a single trial of a previously mastered procedure or imitation target. A correct response to this mastered target was reinforced with brief access to a tangible prior to beginning the next trial.

Results

The Antecedent Picture Prompt (APP) condition resulted in the fastest acquisition of the receptive identification skill for the presented stimuli. Prior to conducting the initial pretest, the classroom receptive identification procedure was implemented and run for a total of 5 sessions over the course of eight days until the whistle-blow criterion (20% or below for five consecutive sessions) was met. The pre-test was then conducted using 24 comparison stimuli for three sessions, utilizing only the auditory stimulus; no response was made during the pre-test. The three modified receptive identification conditions were then implemented.

After running the first session for the APP condition, the participant still had not emitted a response. Rather than moving on to the Consequence Picture Prompt (CPP) or Least-to-Most Physical Prompt (LTM), a previously mastered matching procedure was run with alternate stimuli on the stimulus board to familiarize the participant with the board itself. Once this had been run, responding did begin to occur in all three conditions.

Mastery criterion (3 of 5 consecutive sessions at 88% or greater) was met for the APP condition with the 100% opacity picture prompt by the fourth session, and a probe was conducted to assess mastery with only the auditory stimulus. The participant selected 3 of 16 stimuli correct during the probe, and stimulus fading was introduced. The 10%, 5%, and 4%

opacity picture prompt cards were each mastered in one session, while the 3% opacity card was switched out for the 2% through within session fading in session 9. During sessions 13 and 14, an 81% and 94% correct were achieved and a probe was conducted. Mastery criterion was not met during this probe as an 88% correct was necessary and only an 81% was achieved so a second probe was run. Upon running the probe for a second time, the participant selected 15 of 16 stimuli correct in session 16, and mastery criterion was officially met for the APP condition (Figure 1).

After a brief period where responses leveled at 63% correct, mastery criterion was officially met for the CPP condition in session 17 when the participant selected 88% of the presented stimuli correctly. A generalization probe involving different pictures of the same stimuli was then run for both the APP and CPP conditions. This occurred in the 19th session for the APP condition, and in the 20th session for the CPP condition; the participant selected 16 of 16 stimuli correct for both generalization probes (Figure 1 & Figure 2).

The LTM condition was the only condition in which the mastery criterion was not reached. However, the APP condition was implemented to teach the stimuli that had been originally presented in the LTM condition (Figure 3). Three sessions were run with the 100% opacity picture prompt and the participant quickly met the mastery criterion by selecting 16 of 16 stimuli correctly in all three. A probe was then run to evaluate if stimulus fading should be implemented; however, the participant once again selected all stimuli correctly and experimenters moved to conducting a generalization probe. The participant achieved a 100% for the generalization probe for these stimuli, and sessions were discontinued.

Discussion

The goal of the receptive identification procedure was achieved; out of three conditions the most effective method was clearly identified, and the participant did gain the receptive skill for the given stimuli. The participant reached the mastery criterion for the Antecedent Picture Prompt (APP) condition within 16 total sessions. The Consequence Picture Prompt (CPP) condition also reached mastery levels, though at a slower rate than the APP condition, and generalization probes were run for both. The participant was able to master both generalization probes without any error. The Least-to-Most Physical Prompt (LTM) condition was the only condition in which the participant did not achieve mastery and was the least successful in that 2 of the 4 stimuli were very rarely, or never selected (Figure 6). However, the stimuli presented for the condition were mastered through the use of the APP condition (Figure 3).

The study's first limitation occurred within the first session after the completion of pretesting. The APP condition was the first introduced, however, the lack of response seen during pretesting continued. Hypothesizing that the lack of responding may have been due to unfamiliarity with the stimulus board, experimenters ran a previously mastered matching procedure in which the student was to match a picture card to an identical picture card presented on the board. This procedure helped to both familiarize the student with the stimulus board, and to reinforce attending to it; responding began to occur directly after its implementation. Due to its immediate impact on response levels, future studies would be wise to consider the introduction of a matching procedure using the stimulus board prior to beginning sessions.

Another rather pressing limitation of the study were daily time limits, especially during the early stages of the intervention. As each session consisted of 16 trials they often ran for an extended period during the day which limited the amount of time for other procedures in the

participants program. For this reason, alongside the ability to complete all trials in a limited time frame, it may be useful for future researchers to assess the exact length of time needed for completion of all three conditions. Sessions were often limited to 2 conditions a day rather than 3 due to these constraints, and breaks and absences were frequent due to weather conditions and school holidays. This may have attributed to a slower acquisition of the receptive skill in all conditions, though as scores remained rather high in the APP condition it is also possible that there was little to no effect.

Future research would do well to explore not only more participants but also more varied environments and complex comparison stimuli. Additional participants would allow researchers to determine if the current studies results can be replicated with other participants. While more varied environments may allow for greater generalization of the skill while the procedure is run. It would be interesting to see how the procedure, once mastered with simple and more familiar stimuli, translates to more complex and unfamiliar stimuli such as older cartoon characters or objects one may not encounter often.

References

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Figures

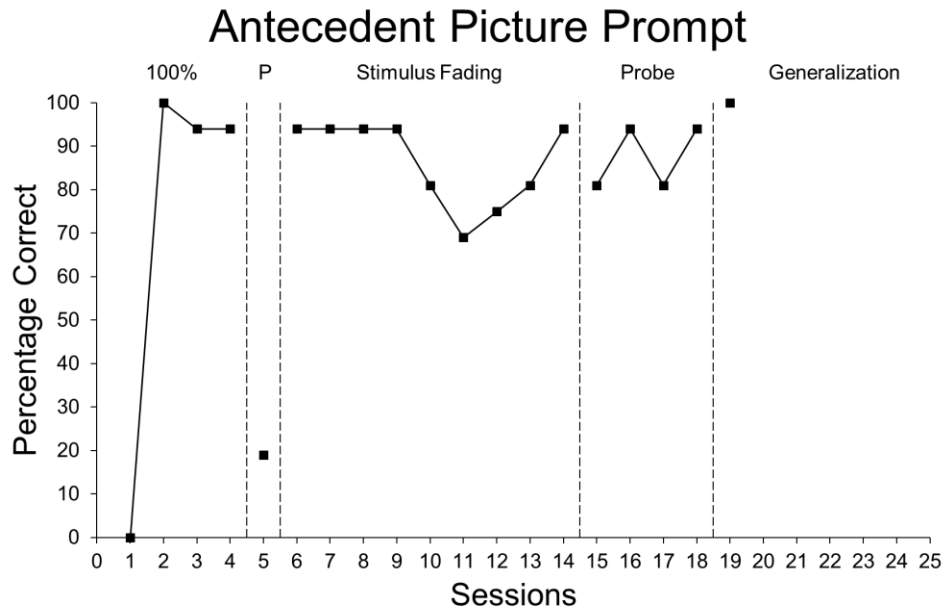


Figure 1. Antecedent Picture Prompt (APP) condition percentage totals per session

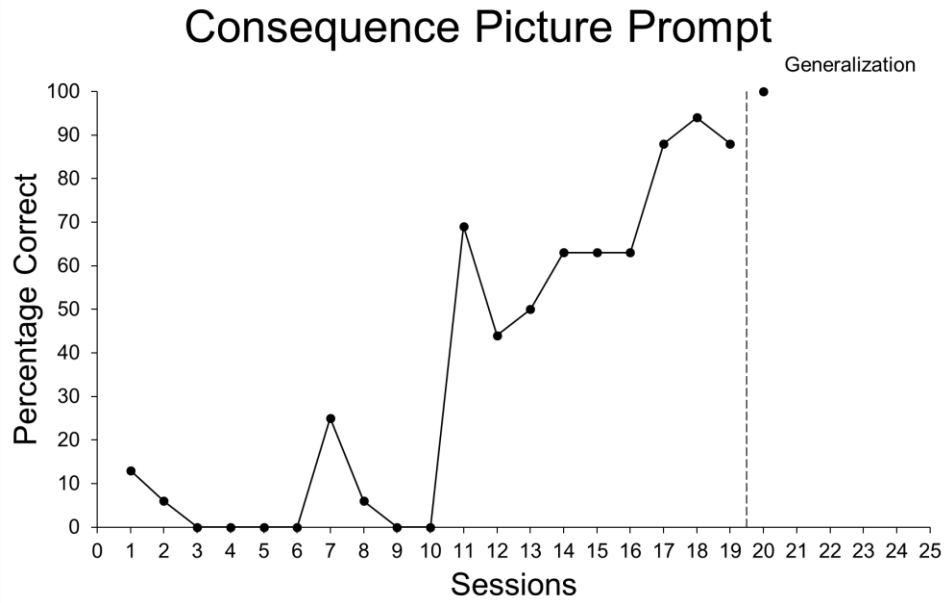


Figure 2. Consequence Picture Prompt (APP) condition percentage totals per session

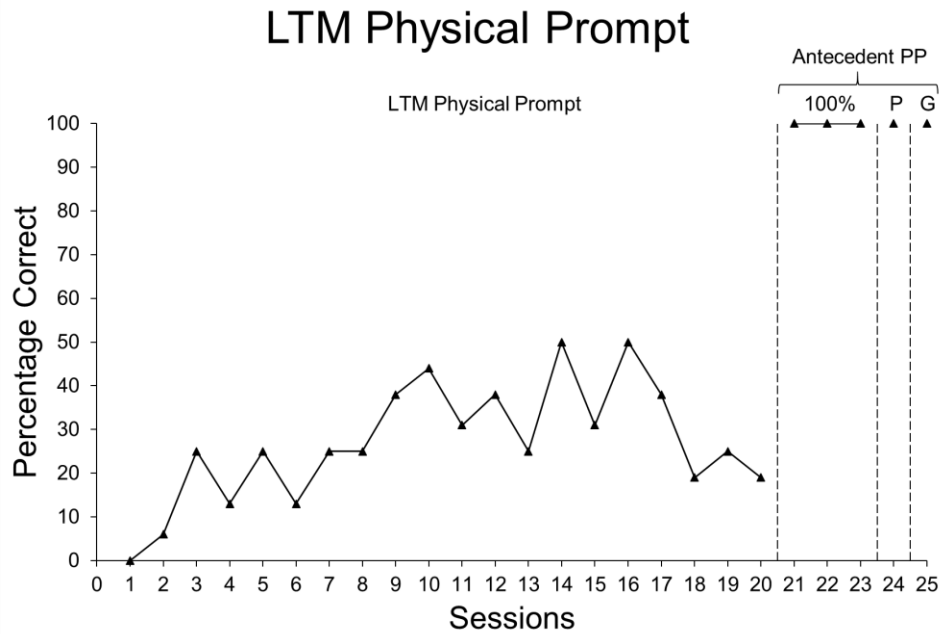


Figure 3. Least-to-Most Physical Prompt (LTM) condition percentage totals per session

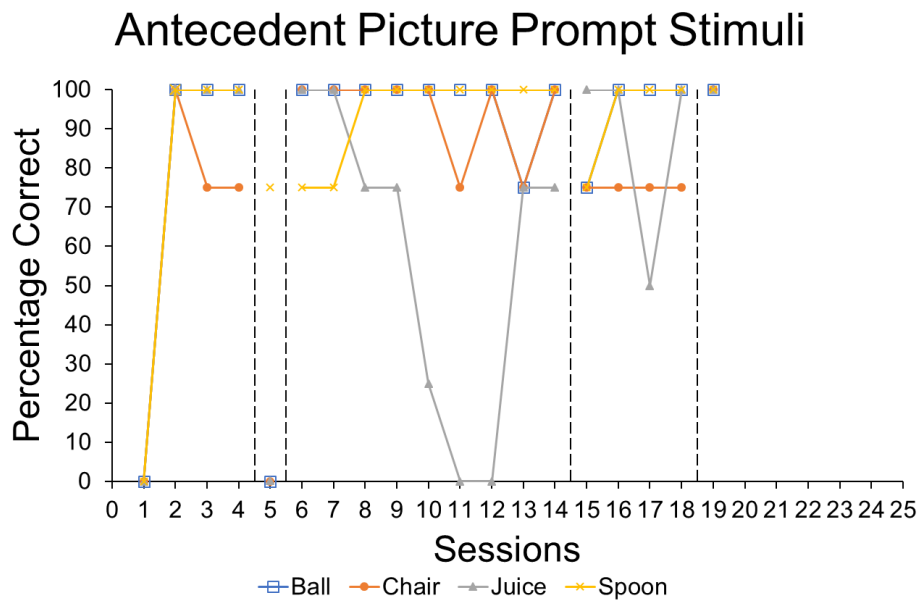


Figure 4. Antecedent Picture Prompt (APP) condition selection percentages for individual stimuli by session

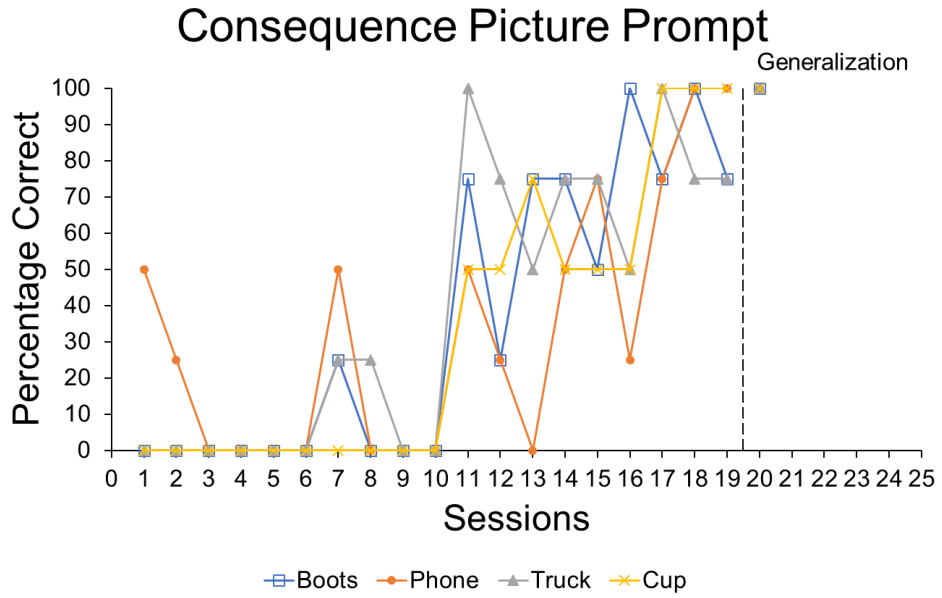


Figure 5. Consequence Picture Prompt (CPP) condition selection percentages for individual stimuli by session

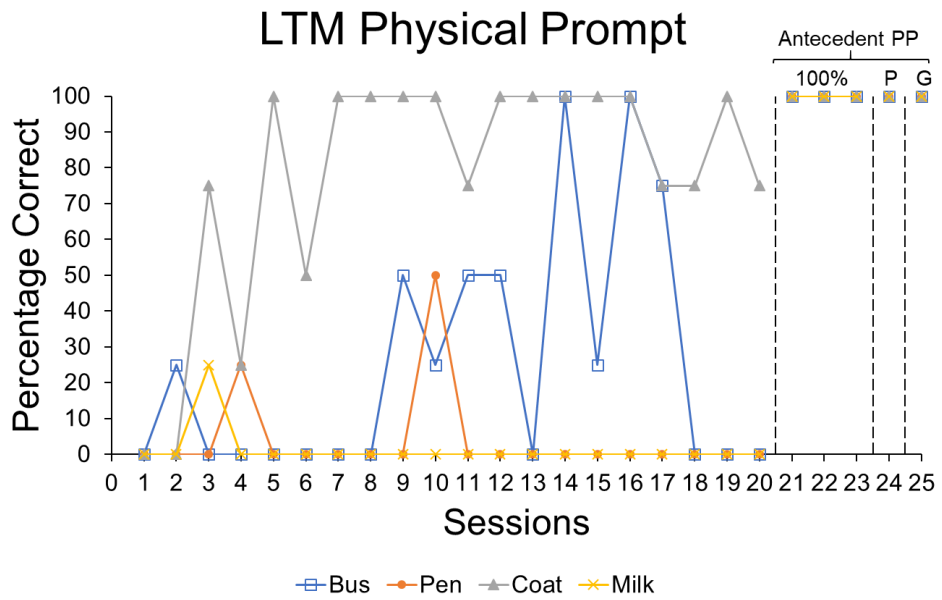


Figure 6. Least-to-Most Physical Prompt (LTM) condition selection percentages for individual stimuli by session