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Teaching Children with Autism to Make Independent Requests Using an Echoic-To-Mand Procedure

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by

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Mands are a vital skill for the development of a child's communicative repertoire and are typically a major focus of early intensive behavior interventions (EIBI). Naturalistic teaching is more efficient than Discrete-Trial Training (DTT) for teaching mands (Jennet, Harris, & Delmolino, 2008); and therefore, the present study used crucial components from naturalistic teaching to teach mands in a discrete-trial format, using an echoic-to-mand procedure. This intervention increased the children's independent vocal requests. Initially, they learned to mand for items in sight and eventually for those out of sight.

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INTRODUCTION

The mand is considered one of the most crucial verbal operants (Albert, Carbone, Murray, Hagerty, & Sweeney-Kewin, 2012). It is the only verbal operant selected by motivating operations and is maintained by the corresponding reinforcer, primarily benefitting the speaker (Skinner, 1957). Due to the direct benefit of the speaker, the advantage of teaching mands in comparison to other verbal operants is clear (Shafer, 1994). Given this advantage, it is common for researchers to recommend teaching mands as the starting point when teaching verbal behavior (Drash, High, & Tudor, 1999; Brady et al., 1995; Shafer, 1994).

Mand training can be conducted in a naturalistic setting or a discrete-trial setting. Both teaching settings improve the acquisition of vocal mands (Delprato, 2001), though naturalistic mand training has resulted in more independent requests and faster acquisition of those requests (Jennet et al., 2008). This may be because items targeted in a naturalistic setting are typically determined by the child's motivation, and discrete-trial mand training typically relies on the instructor to determine the targeted items. By following the child's motivation, naturalistic teaching is more likely to teach the child to mand for items under the relevant stimulus conditions (e.g., when the relevant motivating operation is in place). Furthermore, discrete-trial mand training may teach the child to mand for items under stimulus conditions that differ from conditions under which mands typically occur, such as those that typically control a tact. However, a disadvantage of naturalistic mand training is that sessions are paced by the child, which may result in fewer learning opportunities in each session if there is not a strong motivating operation in place, in comparison to discrete-trial mand training which is paced by the instructor (Jennet et al., 2008).

Also, there are different methods by which mands may be trained. One contrives motivation by removing an item crucial to completing a behavioral chain and then uses that motivation to teach a mand for the missing item (Albert et al., 2012; Hall & Sundberg, 1987). A benefit of this method is that the mands are taught within a behavior chain and the absence of an item needed to complete the chain is what controls the response. Teaching mands in this way then teaches the participants to mand for items without requiring them to be in sight.

Individuals with autism have also successfully acquired mands through the use of stimulus-stimulus pairing and direct reinforcement. This method is typically used with individuals who make few vocalizations; it works by establishing the few sounds they make as conditioned reinforcers so that they are more likely to emit those vocalizations. Any time those vocalizations are emitted by the individual, a reinforcer corresponding to it is presented (Fronapfel-Sonderegger, 2012).

Mands have also been taught by transferring the control of the response from one verbal operant to another. For example, in some cases, without direct training, stimulus control may transfer from the discriminative stimuli that control a tact to the motivational stimuli that control a mand (Davis, Kahng, & Coryat, 2012). However, the present study evaluates another common method, an echoic-to-mand procedure which transfers the control of a response from a preceding vocal stimulus to a motivating operation (Greer & Ross, 2008; Kodak & Clements, 2009).

Greer and Ross (2008) describe an echoic-to-mand procedure where the technician holds a preferred item in sight and immediately states the correct vocal mand as a prompt. If the child correctly echoes that prompt, the technician would immediately provide the reinforcer. After 3-5 consecutive, correct, echoic responses, the prompt would no longer be provided, and independent mands are then targeted. If the child then independently mands 3-5 times consecutively, a

targeted mand would be considered mastered. If the child did not emit the correct mand independently, the technician provided a prompt after a short delay, and that trial would be considered incorrect. If 3-5 consecutive incorrect responses occurred, they would move back to providing the immediate echoic prompt. This would continue until the child mastered that mand target.

The main purpose of the present study was to evaluate a mand-training intervention, based on a modification of Greer & Ross' (2008) echoic-to-mand procedure. In addition, we conducted a reinforcer assessment at the start of each session and within a session, as warranted. Also, we used a structured mand-training procedure that could be implemented with high treatment integrity by beginning technicians.

The present study also had secondary goals. One secondary goal was to look at the correspondence between the emitted mands and what was selected when the items were presented in an array. As mentioned earlier, a criticism of teaching mands in a discrete-trial setting is that those mands are not taught under proper motivational control, rather they are frequently established under the control of some nonverbal, discriminative stimulus. Thus, correspondence was measured to ensure that the children were manding for items under the control of their own preference (i.e., motivating operation) and not just the sight of an item.

Another goal was to teach the children to mand for these items when they were out of sight. This was done in conjunction with the correspondence training to help further bring the mands under proper motivational control. It was also included because it would benefit the children participating in this study, giving them a way to mand for items they want or need without an adult providing them with options.

METHODS

Participants and Setting

This study took place in a special education preschool classroom, where graduate and undergraduate students from Western Michigan University provide one-on-one applied behavior analysis services in a discrete-trial format.

Three children from the classroom were included in this study because they could approximately echo a minimum of four words that would be understood if heard by a stranger, had at least three preferred items based on the results of a formal preference assessment (DeLeon & Iwata, 1996; Fisher et al., 1992), and had not acquired vocal mands. All three children had an autism diagnosis.

Nate was a four-year-old boy who had been receiving services in the classroom for one year prior to this study. One month prior to the intervention, he scored 56.5 on the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) (Sundberg, 2008) and scored a total of 73 on the Early Echoic Skills Assessment (EESA) (Esch, 2008), meaning he was able to echo two-syllable combinations accurately and echo three-syllable combinations with an understandable approximation. He was not emitting independent vocal mands at the beginning of this study, though he could independently mand by exchanging icons. Prior to this study, he was not able to identify a specific item in an array when asked to do so, though he could spontaneously tact four items without prompts and follow simple directions to engage in four different motor actions. He also engaged in some problem behaviors such as swiping materials off the desk, flopping to the ground, and climbing on tables.

Paul was a three-year-old boy who joined the classroom five months before being included in this study. His most recent VB-MAPP was conducted two months before the

intervention; he scored a 32.5 overall and a 17 on the EESA, only being able to echo sounds which consisted of one, simple syllable. This assessment also showed that he had generalized imitation of motor actions and could reliably match identical objects. Like Nate, Paul was able to independently mand by exchanging picture icons but was not vocally manding. One week prior to this study, he began clearly echoing most of the instructions presented to him as well as vocal models if presented during echoic probes; this led to his consideration for this study.

Scott was a three-year-old boy who had joined the classroom one month prior to being included in this study. His intake VB-MAPP assessment was conducted three days before the intervention; he scored a 34.5 overall and a 29 on the EESA, demonstrating the ability to echo some two-syllable combinations. Additional skills demonstrated during the assessment were matching identical items, generalized imitation of gross motor movements, and some direction following. Scott could mand for some items by exchanging picture icons but was not yet using his icon book to spontaneously mand; rather, he only exchanged icons in contrived situations.

Experimental Design

We used a multiple-baseline design across targeted mands to assess the effects of the echoic-to-mand intervention on independent vocal mands. In addition to controlling for confounding variables, this design allowed us to assess whether the introduction of new mand targets interfered with the maintenance of previously mastered targets. We were also interested in measuring whether the rate of acquisition increased as more targets were learned.

Interobserver Agreement and Treatment Integrity

All sessions were conducted by the experimenter or a trained research assistant. Behavior technicians who regularly worked with each child or the trained research assistant collected trial-by-trial interobserver-agreement (IOA) data and treatment-integrity data. We measured treatment

integrity by recording the percentage of steps implemented correctly, based on a task analysis for each phase of the procedure (see Appendix A).

For Nate, IOA was assessed on 33% of the sessions across all phases, with a mean agreement of 93.86% and a session range of 50% to 100%. Treatment integrity data were also collected during 33% of the sessions across all phases, with a mean agreement of 100%.

For Paul, IOA was assessed on 46% of the sessions across all phases, with a mean agreement of 99.08% and a session range of 94.44% to 100%. Treatment integrity data were also collected during 46% of the sessions across all phases, with a mean agreement of 100%.

For Scott, IOA was assessed on 40% of the sessions across all phases, with a mean agreement of 98.93% and a session range of 90% to 100%. Treatment integrity data were also collected during 40% of the sessions across all phases, with a mean agreement of 99.77% and a session range of 97.5% to 100%.

Procedure

Preference Assessment

Preference assessments were conducted to develop a hierarchy of preferred items for each child. Results of the preference assessments determined which items were used and the order in which they were targeted in the mand training, usually starting with the most preferred available, though in Scott's case, that reinforcer was only used in another study. A multiple-stimulus without replacement (MSWO) preference assessment (DeLeon & Iwata, 1996) was used for each participant because all three boys were able to select items from a larger array. A minimum of four items were identified and targeted for each child. Though initial preference assessments were conducted for both tangible (e.g., toys) and edible reinforcers, it was found that preference shifted often for the tangible items with Nate and Paul. Therefore, only edible reinforcers were

considered as possible targets for Scott, who joined this study later. Scott was participating in another study at the onset of this study; thus, the primary reinforcer used in that study, M&Ms, was not considered as a target within this echoic-to-mand procedure.

Baseline

During baseline, we conducted an informal, forced-choice preference assessment (Fisher et al., 1992) using two of the items previously identified to be highly preferred. Informal preference assessments were implemented by holding up two of the target items and using the item selected in the next trials. We then held that item near the child for 5 s, without providing access to it. If the child engaged in an independent vocal mand for the item within those 5 s, we delivered that item. If no response occurred or the child made an incorrect response, we removed the item from sight, ending the trial. A new trial began 3-5 s later when we presented the item again. If the child gave any indication that the item was no longer preferred by either not accepting it when it was given to him, pushing the item away when it was held near, or vocally stating, "No," a new informal, forced-choice preference assessment was conducted with different items. Sessions consisted of five trials for each of the two to four preferred items. Due to the lack of reinforcement in baseline, every 1-3 trials we delivered the targeted items contingent on correct responses to simple demands (responses already in the child's repertoire or previously mastered in the classroom).

Phase 1, Immediate Prompt

When a target reinforcer was moved into Phase 1, the child was no longer allowed access to that reinforcer during their school day, outside of the echoic-to-mand training sessions. Trials in Phase 1 started the same way as trials in baseline; the child selected a preferred item, and the experimenter held the item near the child while preventing access to that item. In this phase, the

experimenter provided an immediate echoic prompt as the item was held near the child. If the child correctly imitated the echoic prompt within 5 s, we scored the trial correct and immediately provided the relevant item. If the child made no response, or made an incorrect response, the echoic prompt was repeated up to two times following its original presentation. If the child responded correctly to one of these additional prompts, we immediately provided the item, but scored the trial as incorrect. If the child did not engage in the correct response after the third echoic prompt, we removed the item from sight until the next trial. This correction/prompting sequence was used in all four phases of training. If the child independently manded for the item during the interval between trials, we immediately presented it and scored the trial as independent and correct. Data for a target were only scored for a session if 5-10 trials were conducted (sessions had fewer trials if the child no longer showed interest in the item or was refusing it). Targets moved into the next phase when the child scored 100% correct in one session, or if they independently manded for the item in 50% of the trials for one session.

Phase 2, Delayed Prompt

Two primer trials preceded each Phase 2 session. A primer trial included an immediate echoic prompt. The purpose of primer trials was to decrease the likelihood of an incorrect response on subsequent trials by providing an immediate model of the correct response. Primer trial data were not included in the percentage correct for Phase 2 sessions. Phase 2 sessions began immediately following primer trials. In this phase, for the remainder of the session, the procedure previously described was used, except that the echoic prompt was delayed by 5 s. If the child manded correctly before or after the prompt, we scored that trial as correct and immediately provided the relevant item. If the child emitted a sound other than the desired sound before or after the prompt, we scored that trial as incorrect and provided up to two more

additional prompts. As in Phase 1, a target was considered mastered when the child scored 100% correct for one session, or if they independently manded for the item in five out of 10 trials. Targets were moved back to Phase 1 if the child scored 80% correct or less for two consecutive sessions.

Phase 3, Independent Response

In Phase 3, sessions were preceded by only one primer trial. If the child manded independently, we scored that trial as correct and immediately provided the relevant item. If the child engaged in an incorrect mand or did not respond within 5 s of the presentation of the item, we scored the trial as incorrect and provided up to two additional echoic prompts. Phase 3 was considered mastered when the child scored 90% correct or better for two consecutive sessions, or 80% correct or better for three consecutive sessions.

Phase 4, No Primer Trials

Phase 4 was identical to Phase 3, except no primer trials occurred before the sessions.

Maintenance

Once a target met the mastery criterion for Phase 4, we moved that target into a maintenance phase. We conducted five trial sessions for targets in this phase. Maintenance targets continued to be available only during experimental sessions, though once Scott manded for a target, “banana,” which was available during breakfast; Nat and Paul never manded outside of the sessions. When three targets reached the maintenance phase, all three of those targets were again available throughout the child’s day; and we continued training with the remaining target. This was done so that those three targets could serve as reinforcers during the other programs implemented throughout the day.

Correspondence

After the child mastered all targeted mands, we tested for correspondence between the mand and what the child selected (Frost & Bondy, 2002). Items corresponding to the previously mastered mands were now placed in an array on the table in front of the child. Following a mand for any of the items in the array, the child was given the opportunity to select that item. If the child selected the item corresponding to the emitted mand, he was allowed to consume it, and we scored the trial as correct. If the child attempted to select an item that did not correspond to the emitted mand, we blocked access and provided an echoic prompt for the correct mand. If the child echoed the model, he was allowed access to that item; but the response was considered incorrect. Following a mand and selection, the selected item was removed from the array and replaced with a novel, untargeted item, to ensure an equal number of distractors for all target items. Once all four targets had been selected, the array was arranged again, so that it contained only the four target items. This phase was considered mastered when the child engaged in correct responses in 80% or more trials for three sessions or 90% or more trials for two sessions.

Manding for Items Out of Sight

Once mastered, items were gradually faded from sight. After the initial correspondence phase, the target items were put in a small, translucent hardware organizer. Except for the presentation of the items, sessions were still conducted as in the correspondence phase. Five pieces of each target item were placed in the container, allowing the opportunity for each mand to be reinforced up to five times. If the child manded for the same item more than five times, the experimenter said, “It’s all gone,” and waited for a new request. In the next phase, the container was covered to block the sight of the items inside. In the final phase, items were kept out of sight, in an apron worn by the researcher. In this phase, correspondence responses were

considered correct if the child consumed the item and incorrect if the child did not accept the item.

Additional Mands

The last step in our intervention focused on increasing the variety of mands in the child's repertoire, by teaching additional mands in a more naturalistic style. Now that we had taught some mands, additional mands were taught in a natural setting such as the class's playroom or hallway. Sessions were 10-20 min in duration and consisted of blocking the child's attempt to access preferred items, giving him a chance to mand, and providing a model prompt, as needed. If the child correctly echoed the prompt, that item was provided for 5-10 s. During these sessions, the number of independent and prompted mands were counted for each target. A target was considered to be mastered when 100% of all requests for that target were independent across two consecutive days, if the child manded for the item at least once. Additional experimenters were also present during this part of the intervention and helped block access to reinforcers and provided them contingent on independent or prompted mands. This was done to generalize the students' mands to other instructors.

Paul had some stimulus control issues when sessions were attempted in the other settings; therefore, his sessions were conducted in his work area. A variety of items were present there so that he could attempt to access them like the other children did in the playroom and hallway settings.

RESULTS

Nate

Echoic-to-Mand

Nate learned four vocal mand targets in 38 sessions with relatively few errors (see Figure 1). The mean acquisition rate for each target was approximately 90 trials or nine sessions. When errors did occur during echoic-to-mand training, it was typically during sessions in which a new mand had been introduced. “Cheez-It” mand training was discontinued in session 13 because Cheez-Its were no longer preferred. They were targeted again starting in session 36, when Nate started showing interest in them again (see the first graph of Figure 1).

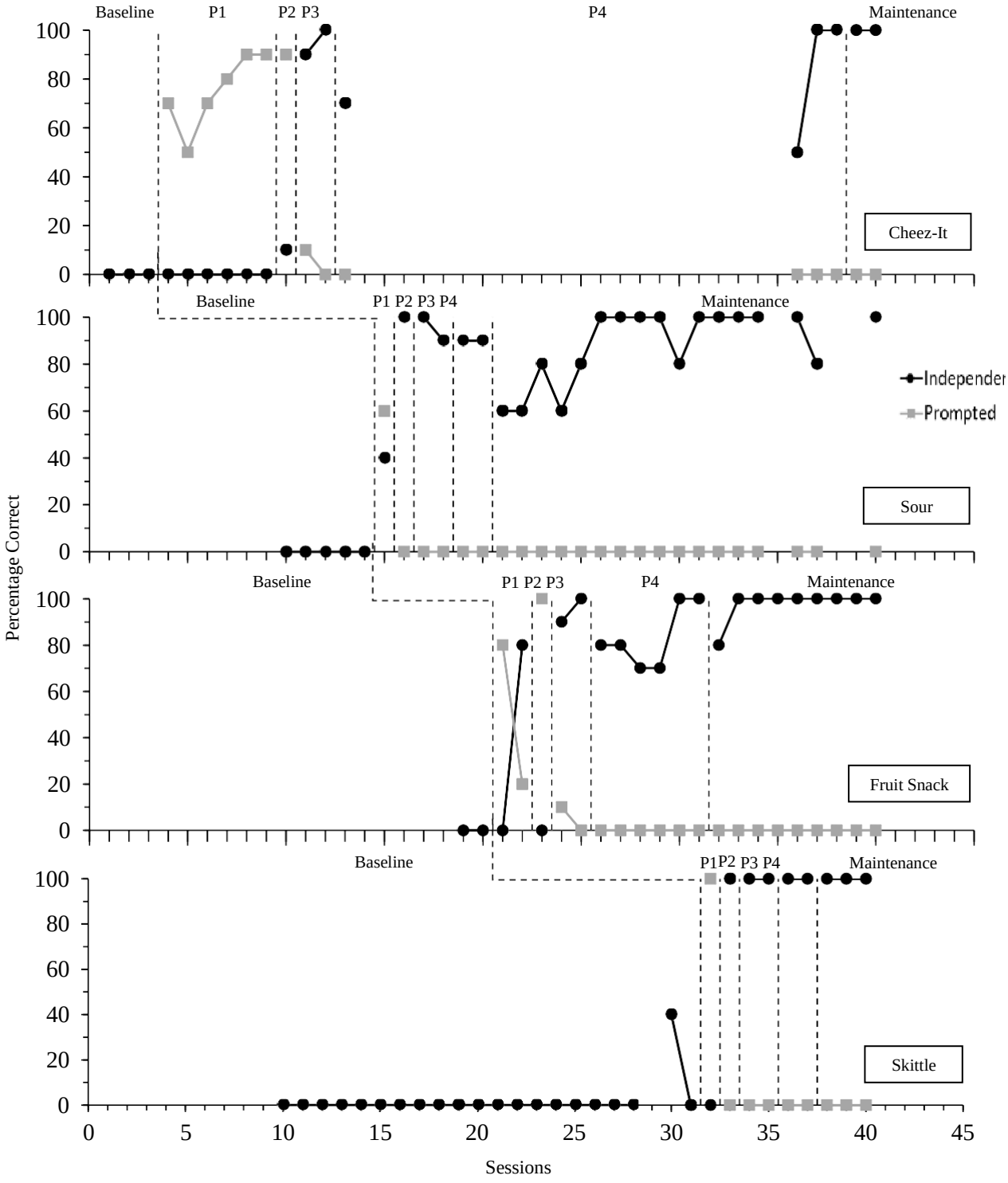

Figure 1. Echoic-to-mand training for Nate. The black circles represent independent mands and the grey squares represent prompted mands. P1 refers to Phase 1, P2 refers to Phase 2, etc.

Correspondence and Fading

Correct responses remained high for the four mands as we tested correspondence and as they were faded from sight. Nate scored an average of 94.7% correct across all phases of the correspondence and fading procedure, suggesting that mands had been taught under the proper control of the motivating operation (see Figure 2). When some items lost their reinforcing value for Nate, they were no longer included in a session and thus the sessions ranged from 6-20 trials. One anecdotal benefit of this portion of this study was the child's acceptance of an item being unavailable. Before this study, Nate engaged in problem behavior such as swiping and flopping when an item he requested via icon exchange was unavailable. However, when Nate was told an item he manded for was "all gone" during the correspondence and fading portion of this study, he would independently mand for a different item without protest.

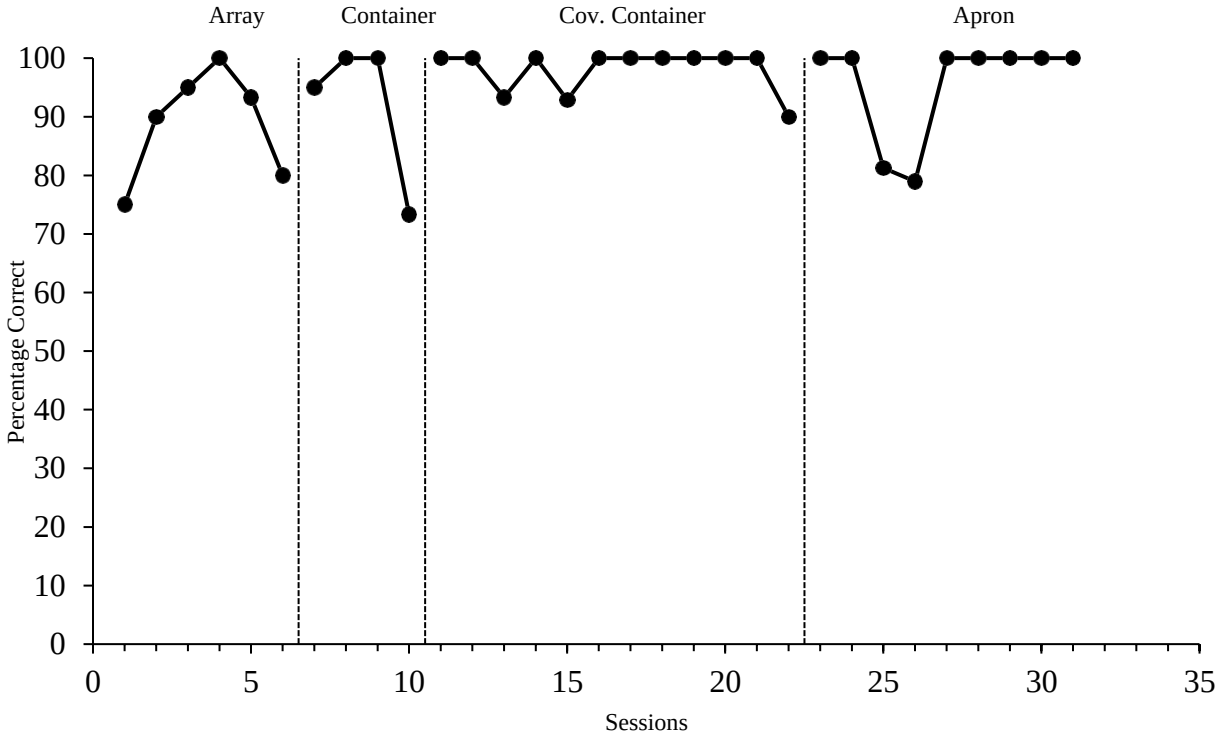

Figure 2. Correspondence training and fading items out of sight for Nate. Phase labels refer to the method in which items were presented or removed from sight.

Additional Mands

Nate acquired nine more mands in 13 additional training sessions. Mands were mastered in an average of 4.63 sessions (see Figure 3).

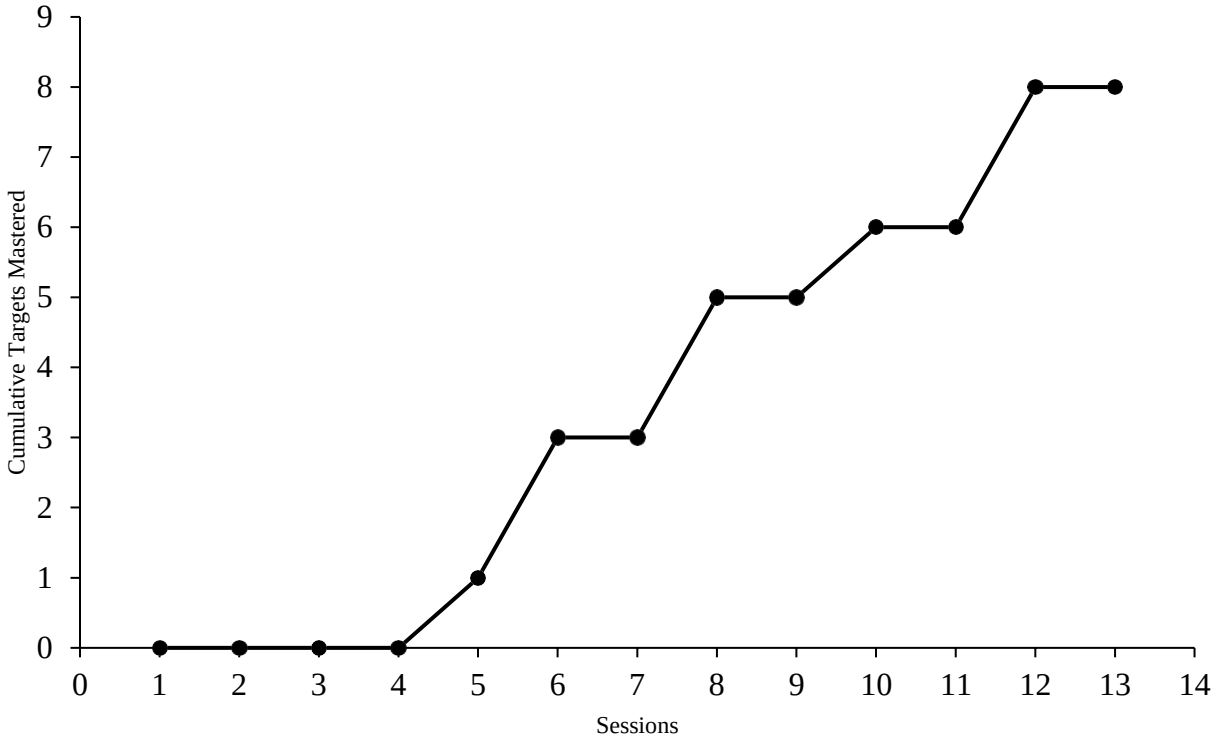

Figure 3. Cumulative mands mastered during additional training with Nate.

Paul

Echoic-to-Mand

Paul learned four vocal-mand targets in 23 sessions, the fewest of any participant (see Figure 4). The mean acquisition rate for each target was 77.5 trials, about eight sessions. As with Nate, most errors that occurred were typically during sessions in which a new item began being targeted.

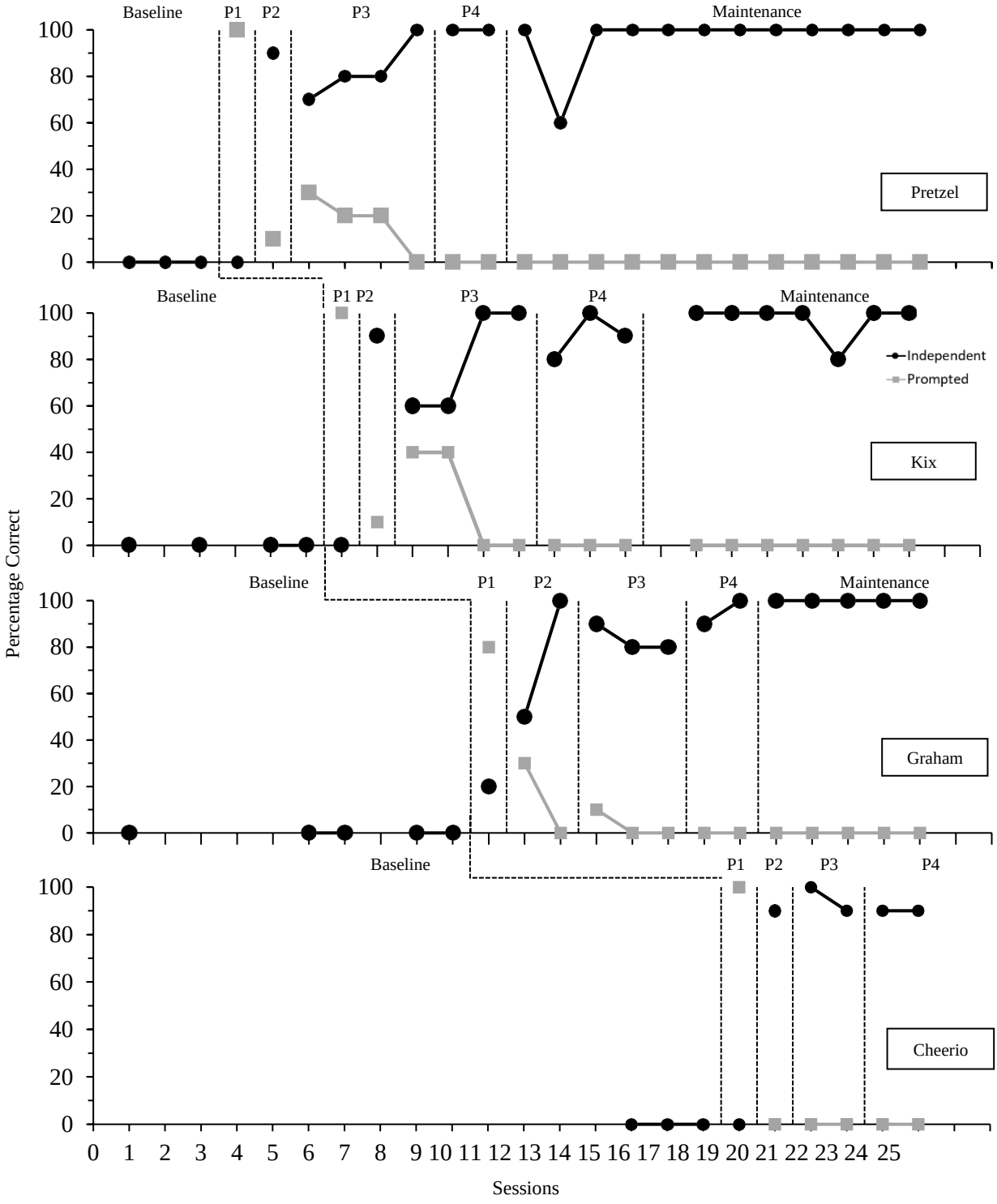

Figure 4. Echoic-to-mand training for Paul. The black circles represent independent mands and the grey squares represent prompted mands. P1 refers to Phase 1, P2 refers to Phase 2, etc.

Correspondence and Fading

Paul's scores remained high throughout all four phases of the correspondence and fading portion of this study. He averaged 90.6% correct responses across 11 sessions, with one session being excluded due to early termination because he was engaging in problem behavior (see Figure 5). Session length ranged from 12-20 trials per session. Paul's preference remained relatively consistent through all four phases, working for all targets in most sessions.

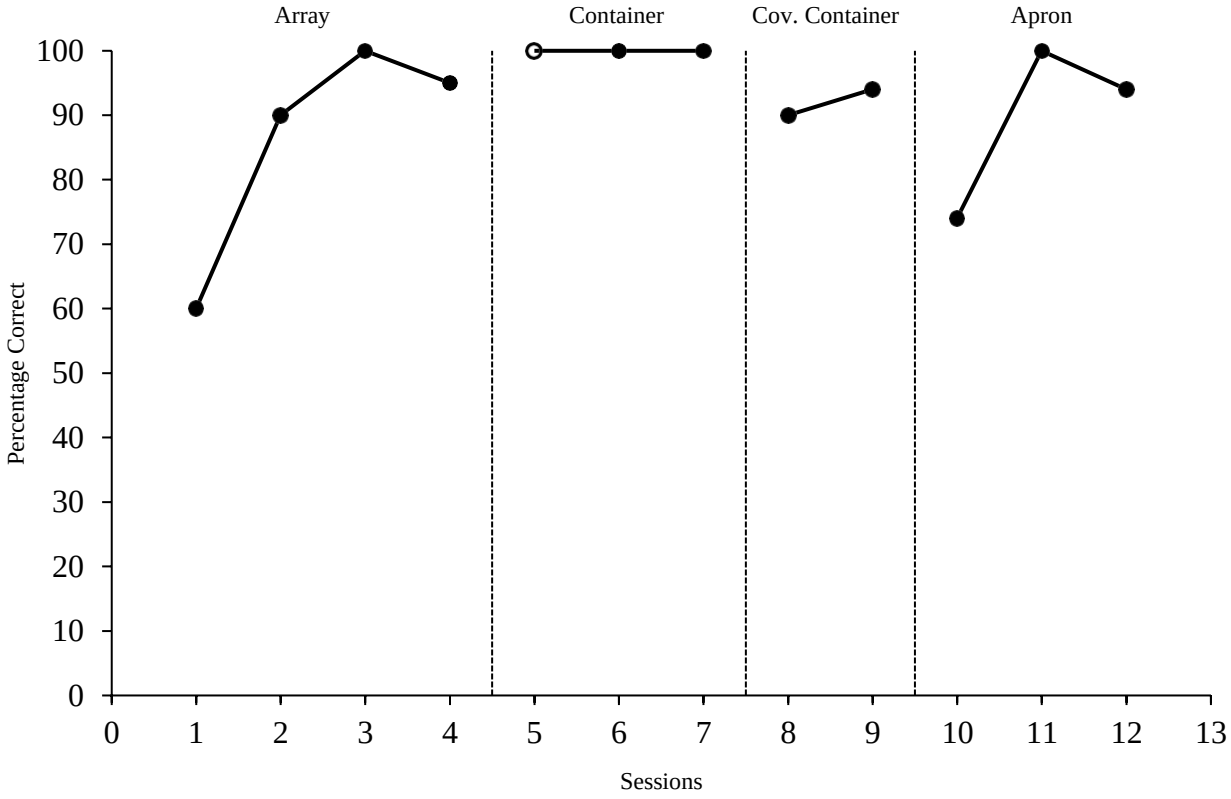

Figure 5. Correspondence training and fading items out of sight for Paul. The open circle represents a terminated session due to problem behavior. Phase labels refer to the method in which items were presented or removed from sight.

Additional Mands

Paul acquired three more mands after 13 additional training sessions. They were mastered in an average of 4.67 sessions (see Figure 6). Two mands, "iPad" and "play," were initially

taught separately. “iPad” was initially taught when he did not have possession of the iPad, while “play” was used as a mand to start videos, if he had possession of the iPad but a video was paused on screen. After six sessions of teaching these two mands without establishing a discrimination between them, “iPad” was taught when a video was paused on screen, as well as when he did not have the iPad.

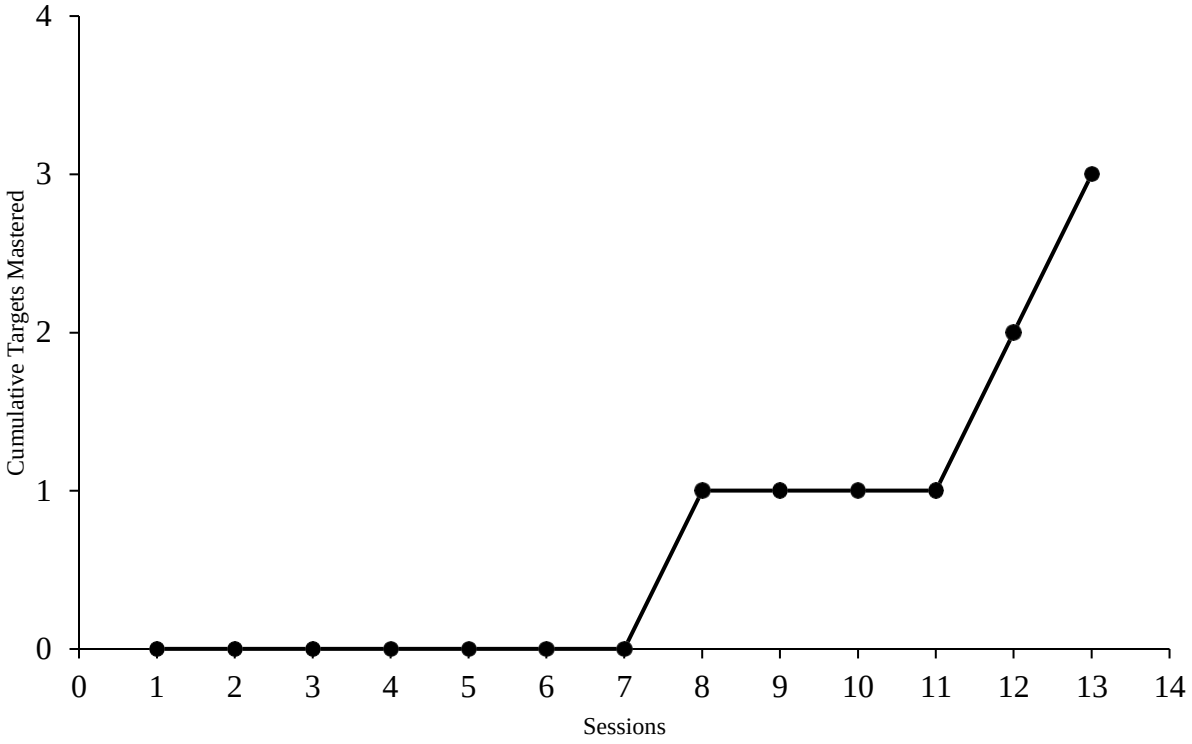

Figure 6. Cumulative mands mastered during additional training with Paul.

Scott

Echoic-to-Mand

Unlike the first two participants in this study, Scott was unable to complete all three parts of this study due to his school closing during the COVID-19 pandemic. At the time of his school closing, he had mastered three of the four mand targets in 33 sessions (see Figure 7). His initial

lack of progress during the training of the first four mands did require some modifications to the procedure. After having met the demotion criteria in Phase 3 and mastery in Phase 2 was met again, Phase 3a was implemented. This phase was identical to Phase 3, only with a 5 s increase in the delay time. When progress was still not demonstrated, all targets except for banana, the highest preferred target at that time, were put on hold and banana was taught in isolation. Mand targets were then reintroduced one at a time, whenever the mand being trained reached mastery. Once targets were trained in isolation, the average number of sessions to mastery was 5.33. The fourth mand target, “melon,” was never acquired, and during the last two sessions before the school closed, Scott began to show a shift in preference by handing the pieces of melon back during the session.

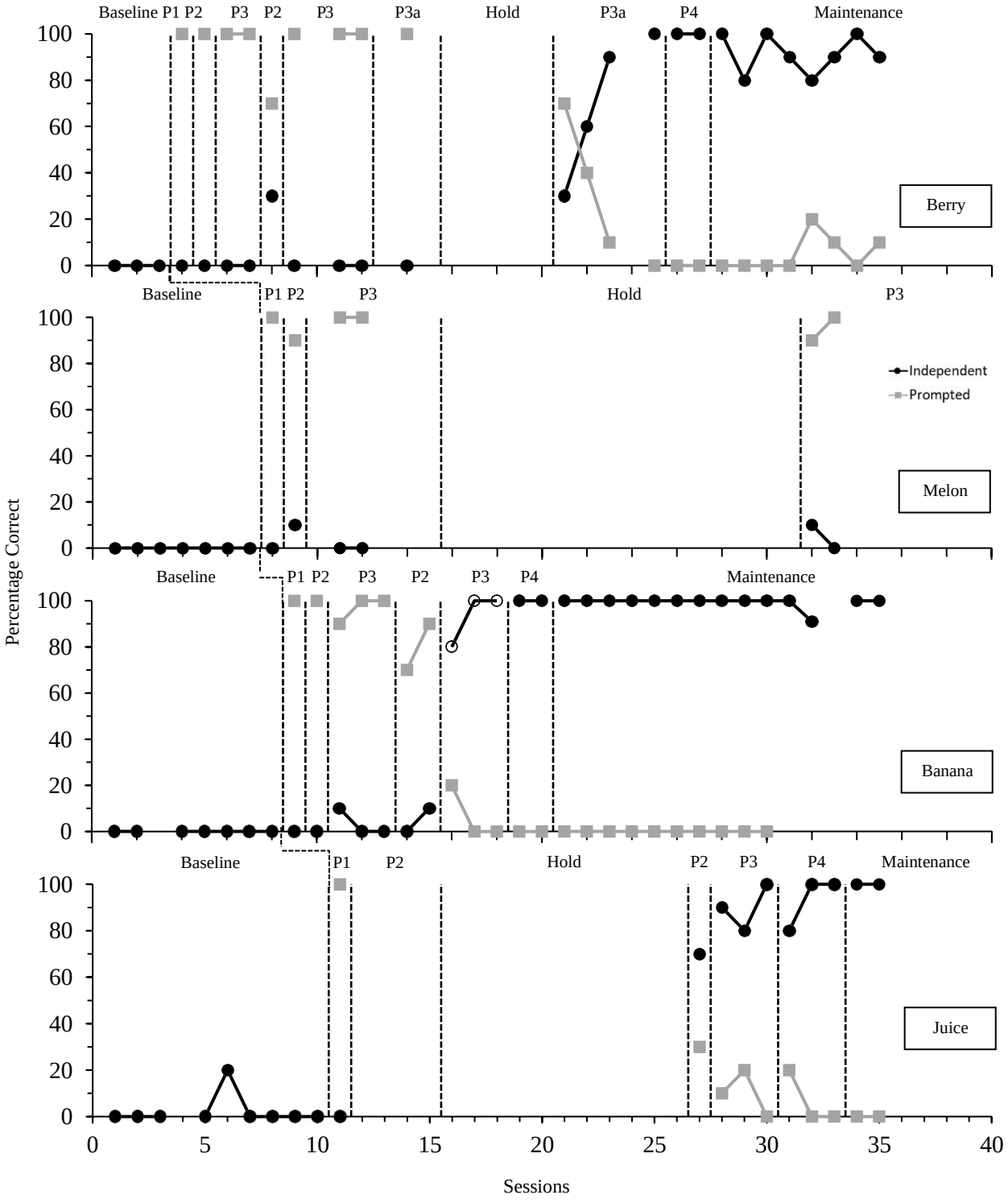

Figure 7. Echoic-to-mand training for Scott. The black circles represent independent mands and the grey squares represent prompted mands. Open circles in the third graph refer to sessions in which that target was taught in isolation. P1 refers to Phase 1, P2 refers to Phase 2, etc.

While Scott never began the correspondence and fading or the additional mands phase of this study, he did begin to show progress toward the goal of those two phases. Correspondence was shown during sessions when Scott manded for a previously mastered target between training trials. When he did this, we presented the item he manded for and the item that was currently being targeted, and we gave him the opportunity to select one. In these situations, he always correctly selected the item for which he manded.

Scott also began to acquire new mands without explicit training in later sessions. During session 25 he began manding for "peek-a-boo" while pushing the technician's hands toward his face. Around this time, he also began emitting a mand for the iPad and for muffins, which were frequently available to him at breakfast.

DISCUSSION

This study evaluated an echoic-to-mand training intervention which was developed to incorporate some components of naturalistic teaching in a more structured, discrete-trial format. The naturalistic features involved using mand targets selected by the child and ensuring that the controlling variable for the mands was a motivating variable (Delprato, 2001). In addition, the first four phases of this procedure succeeded in teaching a few mands with a small number of errors, proving to be an effective method of establishing the initial mands in a child's repertoire. This study further measured correspondence between the mands the children were engaging in and what they were selecting from an array of reinforcers. For two of the three children, the items were then gradually faded from sight while the child continued to demonstrate correspondence. The high percentages of correspondence through this portion of the intervention showed that the mands emitted were controlled by relevant motivating variables, rather than the sight of the item, in which case, the response would most likely be a tact.

Based on the acquisition of novel mands in few sessions during additional mand training, it should be considered that perhaps we do not need to be worried about whether we use DTT versus naturalistic training. Instead, starting with DTT and then moving on to naturalistic training once the child has begun to acquire mands more efficiently may be the better option.

This study did have some limitations. After the correspondence and fading portion of this study, more mands were taught through additional naturalistic teaching. These mands were established in fewer trials, raising the question of whether we may have been able to establish more mands from the start had we begun with naturalistic teaching. It is not clear how much of a carry-over effect there is from our mand-training procedure to the naturalistic teaching. However, trials to criterion did decrease as more targets were taught during the mand training

procedure, indicating that the training of those initial mands may be partially responsible for the efficiency of teaching seen during the naturalistic phase. The efficiency of the mand-training procedure was at a built-in disadvantage, in terms of how quickly mands could be taught, due to the large number of sessions required for a mand to be considered mastered during that part of the study. In addition, the efficiency might be improved by removing Phase 3 (the decreased number of primer trials), as it is unclear from this study whether it was necessary to have this phase where the only significant change was a decrease in the number of primer trials from two to one prior to each session and that a response was required to be independent to be considered correct. Meaning, if responses were occurring independently during Phase 1, Phase 3 could be deemed unnecessary, eliminating at least two teaching sessions for each target, saving valuable time.

Another possible limitation to this study has to do with whether we truly captured the components of naturalistic teaching within our DTT procedure as intended. The procedure was designed to ensure that the targets being used were items the child was truly motivated for and given that there were only four targets to choose from during a session, there may have been other items the child had a higher preference for at any given time.

One more limitation has to do with the generality of the mand-training procedure. In order to ensure higher integrity and control over the procedure, sessions were only implemented once or twice a day by the researchers. Outside of sessions, the children did not have access to these items even if they manded for them. This created highly discriminable conditions in which vocal mands would be reinforced, possibly decreasing the likelihood of the responses occurring in the presence of other instructors or in other settings. Implementing this procedure throughout the day with all of the child's scheduled technicians should remedy this limitation.

Given the results of this study, several future directions should be considered for research. Implementing this procedure in a more clinical style would be of interest. The present study's use of a multiple-baseline design resulted in a mand being taught in isolation, then eventually introducing another mand target, with the child needing to discriminate between them. In fact, while learning the first two mands, the errors always involved saying the wrong mand of the two being trained; however, the frequency of any errors greatly reduced when learning the next two mands. It is unclear whether this had an effect on this study's results, so it is unclear whether teaching each mand in isolation made establishing the first two discriminations more or less difficult. Teaching all the mand targets simultaneously may also provide a more accurate picture of the teaching efficiency of this procedure as a more typical clinical procedure. Because of the anecdotal result with Nate accepting that a manded item was unavailable, it may also prove beneficial to evaluate the effects of this training on teaching children with autism to accept "No." Primer trials and their use within mand training should also be an area of future research. In this study it is unclear whether they were necessary in gaining the results we did, meaning it would be valuable in future research to measure how much they help in the acquisition of mands.

Given the effectiveness of this intervention, especially with the first two participants, Nate and Paul, the current study provides support for the use of an echoic-to-mand training procedure to teach mands to children with autism. Implementing the correspondence and fading phase of this study, following the acquisition of a few mands, may also prove crucial in ensuring that mands have been truly taught, rather than tacts. However, the limitations of this study and the scarcity of other studies on echoic-to-mand training do call for additional research on this topic.

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APPENDIX A

Datasheet

Child Name:						Tutor Name:							Date:
Target	**Phase**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Percent**	**Target Notes**
Target 1													
Target 2													
Target 3													
Target 4													

Child Name:						Tutor Name:							Date:
Target	**Phase**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Percent**	**Target Notes**
Target 1													
Target 2													
Target 3													
Target 4													

Child Name:						Tutor Name:							Date:
Target	**Phase**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Percent**	**Target Notes**
Target 1													
Target 2													
Target 3													
Target 4													

APPENDIX B

Human Subjects Institutional Review
Board Letter of Approval

WESTERN MICHIGAN UNIVERSITY

Institutional Review Board
FWA00007042
IRB00000254

Date: April 26, 2018

To: Richard Malott, Principal Investigator
Kelly Kohler, Co-Principal Investigator
Michael Tomak, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 18-04-24

This letter will serve as confirmation that your research project titled "Using Echoic-to-Mand to Teach Chilren with Autism to Make Independent Requests" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study***)." Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: **April 25, 2019**

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