



4-25-2015

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Training tutors to use time-delay procedure to increase vocal manding in children with  
developmental disabilities

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## Abstract

Learning how to spontaneously mand, or request without prompting, can be difficult for children diagnosed with developmental disabilities. Previous research has shown that the implementation of a time-delay procedure aids in increasing spontaneous mands with these children (Charlop, Shreibman, & Thibodeau, 1985). The goal of this study was to increase vocal mands in children with developmental disabilities with a time-delay procedure by training their undergraduate tutors, using Behavioral Skills Training (BST), how to implement the procedure in naturally occurring opportunities. The study used a multiple baseline across participants design. The intervention used in this study can help children with developmental disabilities to spontaneous mand for objects when motivation for the object is present. It can also contribute to classroom curriculum as tutors can integrate naturalistic teaching procedures into their classroom as opposed to always using discrete trial training. The results of this study show that both tutors increased their use of the time-delay procedure and both children increased spontaneous manding in comparison to baseline. It is believed that these results were a product of proper training of the tutors and the high treatment integrity of the tutors as they implemented the time-delay procedure. In conclusion, this study was successful in increasing the number of opportunities the tutors used the time-delay and the number of spontaneous mands made by developmentally disabled children.

Training tutors to use time-delay procedure to increase vocal manding in children with developmental disabilities

For children with developmental disabilities, communicating wants and needs can prove to be a difficult task. Learning how to mand, or request, can be one of the most effective ways for these children to receive what they want. However, vocalizing spontaneous mands (mands without prompting) is something that the children need to be taught and something that their tutors should provide the opportunities for them to make. Naturalistic teaching is one manner in which these mands can be taught. In order to increase spontaneous vocal manding, reference can be made to the methodology of a previous study in which vocalizations were increased in children with autism using time-delay training procedures (Charlop, Shreibman, & Thibodeau, 1985). To increase the opportunities for the children to make requests, the time-delay procedure can be taught to the tutors (Halle, Baer, & Spradlin, 1981). The type of training used for instructing the tutors was Behavioral Skills Training (BST). BST has been shown to effectively train staff members to perform mand training with children (Nigro-Bruzzi & Sturme, 2010). The use of the time-delay training with the children conducted by the tutors can be completed during daily activities in familiar settings such as the classroom.

The goal of this study is to further develop the research conducted in previous studies by aiming to increase vocal mands in children with developmental disabilities by teaching the time-delay procedure to their undergraduate tutors. The researchers have the desire for the continuation of the undergraduate tutors training within the early intervention classrooms for developmentally disabled children. The implementation of the time-delay procedure into the school's curriculum is a supplementary goal. An additional goal of this study is for the tutors to

identify and make use of opportunities to use the time-delay procedure more frequently in naturalistic settings.

## **Method**

### **Participants**

Participants for this study were children and undergraduate tutors from the WoodsEdge Learning Center in Kalamazoo, Michigan. The tutors were recruited on a volunteer basis. Two tutors in their second semester of practicum experience were selected to participate (one male and one female). The participating children were recommended based on their current educational goals. The children ranged from 18 months to 5 years of age and had diagnoses of autism and other developmental disabilities. Each student already had an echoic repertoire, or the ability to imitate words that other people modeled for them, which made them ideal candidates for this study.

### **Design**

The study used a multiple baseline design across participants in order to evaluate the effects of training the tutors on the use of the time-delay procedure, the independent variable, on the frequency of the tutors' use of the procedure and child mands, the dependent variables. The purpose of the baseline phase was to record the frequency of the use of the time-delay procedure by the tutors as well as the frequency of spontaneous mands made by the children during their teaching sessions in the absence of the intervention (before BST). Observation periods were 15 minutes. The intervention involved the researchers training the tutors on the use of the time-delay procedures using BST which included instruction, modeling, practice, feedback, and evaluation. As in baseline, the frequency of the use of the time-delay procedure by the tutors and

the frequency of spontaneous mands made by the children were recorded during intervention.

The time-delay procedure included the tutor selecting an item or activity for which the child had motivation and allowed the child to mand for that item or activity without prompting. They did this by allotting a 5 second delay for the vocal mand. If there was not a correct mand after the 5 seconds, the tutor provided a vocal model (e.g., “say more bike”). Once the correct vocal mand was made by the child, the tutor allowed the child access to the preferred item or activity.

### **Procedure**

Two undergraduate tutors were trained on the use of this time-delay procedure and made use of opportunities to use it with the children. The tutor training was completed using Behavior Skills Training (see Appendix B). This included instruction, modeling, practice, feedback, and evaluation. First, the researchers explained to the tutors the rationale behind the study. Next, the researchers modeled the use of the time-delay procedure while the tutor observed. After this, the tutor was given the opportunity to practice while the researchers observed. This was followed by feedback and evaluation. The baseline phase was used to record the frequency of use of the time-delay as well as spontaneous vocal mands made by the children prior to tutor time-delay training. The intervention phase was used to record the same data after the tutor training (see Appendix A).

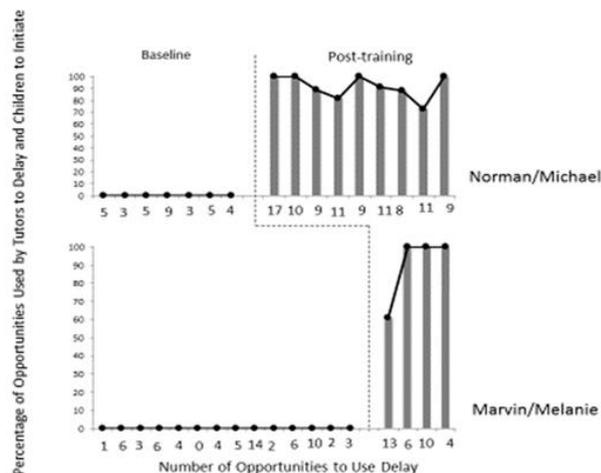
### **Setting & Materials**

This study was conducted in an Early Childhood Special Education Classroom (ECSE). Sessions were conducted in multiple classrooms within the center. Within the classrooms were C-shaped tables, small cubicles for each child containing a small table and two chairs, and a large variety of toys ranging from hand-held toys to bicycles. Data collection materials included

sheets with blank tables, pencils, and a timer. Some of the children’s edibles reinforcers were fruit snacks, cereal, M&Ms, Skittles, marshmallows, and raisins. Some of the toys that were used as reinforcers were toy cars, laptops, Ipad, bubbles, and racecar tracks.

### Results

As for increasing the use of the time-delay procedure with the undergraduate tutors, the researchers were able to successfully instruct, model, and provide feedback for the tutors. The two tutors increased their use of this procedure by identifying opportunities in which to make use of it. As the graph below illustrates, quite a significant change was made from baseline to intervention. The x-axis is the number of opportunities present for the tutors to make use of the time-delay procedure and the y-axis is the percentage of those opportunities in which the tutors actually made use of the delay procedure. The bar graph represents the percentage of those opportunities children emitted a vocal request. Many times the tutors created situations in which they could use the procedure. Some of the opportunities in which the tutors made use of the procedure included when the child was given a car track but not a car and when a child was on a bike but no one was pushing him/her. These made for ideal situations in which to use the time-



delay procedure because motivation for an object or an action was quickly established.

A supplementary goal also included in this study was to implement the procedure into the school's curriculum. Fortunately, due to the success of the study, this goal was also achieved. The school will be adding this procedure to its educational program in the future. The undergraduate practicum included the training in their curriculum for the tutors and making use of the procedure will impact their monitoring scores.

### **Discussion**

Based on the results on the study, it is evident that the use of BST with the undergraduate tutors was effective in increasing their use of the time-delay procedure during naturalistic opportunities. The results were believed to be obtained due to the effectiveness of behavioral skills training. It has been proven to be effective in a variety of situations and that was also the case in this study. Something that could have been done differently would be to have more detailed criterion that must be met for each phase in the BST in order to proceed to the next phase. This would allow for more objective training and hopefully lead to better and more consistent results. Some of the possible confounding variables in this research include the presence of problem behavior. The child working with tutor 1 emitted higher levels of target behavior than the child working with participant 2. This could have made for less opportunities to use the procedure. Another variable that could have played a role was the time period of the intervention. Recording the frequency of problem behavior during baseline and intervention would have been an interesting measure on which to take data. With spring break and student absences due to illness, data collection was not conducted as much as initially planned.

These results and research have various implications in the fields of training and verbal behavior, as well as in classroom curriculum. The results of the tutor training and its effectiveness demonstrate how BST can effectively be generalized to a variety of situations. The results also show that the use of the time-delay procedure applied in naturalistic opportunities is able to increase the spontaneous vocal mands in developmentally disabled children. This means that when motivation for an item is present, the time-delay procedure is able to get children to mand for the item without the use of verbal prompts. If these children have the ability to mand for something when they want it, they will benefit by receiving what they want and the caretaker will benefit by having the children behave in a socially appropriate manner. Incorporating this training and procedure into the classroom curriculum would aid the children in developing their relevant verbal responses. The intervention also benefitted the tutors because they were able to divert from the typical discrete trial procedures and use their own skills to identify opportunities to use the procedure. In fact, using the time-delay procedure was incorporated into the tutors' monitoring scores which insures maintenance of this intervention.

Ideas for possible research in this area include training a larger number of tutors to see if they can be trained as efficiently as the two in this study were trained. Also, it would be interesting to investigate other types of tutor training to use the time-delay procedure to see how they compare to BST. Using the BST model for training other procedures in the classroom could be beneficial as well. Generalization probes to other environments such as the locker room or cafeteria would also be interesting to investigate.

## References

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Appendix A: Data Collection Sheet

Observer 1:                      Observer 2:

Date:                              Time:

Participant:

- Observe in 15 minute sessions
- Y = Yes
- N = No
- IM = Immediate
- D = Delayed

Delay Opportunity	Delay/Prompt Used?			Child Request?		Independent?	
1	IM	D	None	Y	N	Y	N
2	IM	D	None	Y	N	Y	N
3	IM	D	None	Y	N	Y	N
4	IM	D	None	Y	N	Y	N
5	IM	D	None	Y	N	Y	N
6	IM	D	None	Y	N	Y	N
7	IM	D	None	Y	N	Y	N
8	IM	D	None	Y	N	Y	N
9	IM	D	None	Y	N	Y	N
10	IM	D	None	Y	N	Y	N
11	IM	D	None	Y	N	Y	N
12	IM	D	None	Y	N	Y	N
13	IM	D	None	Y	N	Y	N
14	IM	D	None	Y	N	Y	N
15	IM	D	None	Y	N	Y	N
16	IM	D	None	Y	N	Y	N
17	IM	D	None	Y	N	Y	N
18	IM	D	None	Y	N	Y	N
19	IM	D	None	Y	N	Y	N
20	IM	D	None	Y	N	Y	N
21	IM	D	None	Y	N	Y	N
22	IM	D	None	Y	N	Y	N
23	IM	D	None	Y	N	Y	N
Total:	—	—	—	—	—	—	—

Appendix B: Behavioral Skills Training Outline

<b>Performance</b>	<i>Given a child, toys, and a teaching setting the undergraduate behavioral technician will use the time-delay procedure to evoke child requests in 100% of opportunities.</i>	
<b>Rationale</b>	<i>The time-delay procedure has been shown to be effective in increasing child requests and the procedure can be easily incorporated into classroom curriculum and teaching sessions.</i>	
<b>Instruction</b>	<i>The time-delay procedure makes use of a vocal model and a delay to teach children how to request specific items they want. In order for the procedure to be effective, the children should have the ability to imitate words. This ability is known as an echoic repertoire. By using this prompting strategy, control of the vocal response is shifted from that of the auditory stimulus of the vocal model to control of the actual stimulus itself.</i>	
<b>Modeling</b>	<b>Do</b>	<b>Say</b>
	<ol style="list-style-type: none"> <li>1. Show the technician how to perform the time-delay procedure.</li> <li>2. Find a toy or activity that the child enjoys, which will depend on their preferences.</li> <li>3. Begin playing with the toy, when the child reaches for it hold it in front of them and wait for 5 seconds.</li> <li>4. If the child emits a vocalization that resembles the relevant item or activity, deliver that item or activity.</li> <li>5. If the child does not emit a vocalization, provide a vocal model (e.g., "say car"), then deliver the item upon the child's vocalization.</li> <li>6. Ask the technician to do imitate what you did.</li> </ol>	<ol style="list-style-type: none"> <li>1. "Ok (technician name) today we are going to practice and learn how to use the time-delay procedure"</li> <li>2. "First, we are going to look for a toy or activity that the child is interested in. For example, we know (child name) is really into (reinforcer) so we can use that to teach requesting."</li> <li>3. "So, we can take (reinforcer) and start playing with it in front of our child. If the item is valuable and functioning as a reinforcer, it is likely the child will show interest in it such as reaching for it or looking at it. When the child shows interest, we can stop playing with the (reinforcer) and hold it in front of them for 5 seconds."</li> <li>4. "Now one of two things will happen. First, there is a high probability the child will emit a vocalization or request for the item. The vocalization doesn't need to have perfect articulation, but just has to resemble the item. If the child emits a vocalization within 5 seconds, give the item or activity to the child."</li> <li>5. "Another outcome could be that the child shows interest, but does not emit a vocalization within 5 seconds. If this is the case, wait those 5 seconds and then give the child a prompt, or vocal model, of the item or activity. If the child imitates your model, deliver the item or activity."</li> <li>6. "Now it's your turn. Begin enticing with a toy or activity, then use the time-delay procedure"</li> </ol>

	<p><i>to evoke a request from your child."</i></p>
<p><b>Practice</b></p>	<p><i>The technicians will practice the performance by imitating the actions of the researcher. The researcher will explain and provide a model of the procedure. After modeling the procedure, the researcher will ask the technician to perform the procedure. After performing the procedure, the technician will receive feedback from the researcher. The researcher will ask the technician to perform the procedure until they do not make any errors. Throughout the training, the researcher will answer any questions the technician may have.</i></p>
<p><b>Feedback</b></p>	<p><i>Praise statements:</i></p> <p><i>"Nice, that is a perfect use of the time-delay procedure!"</i></p> <p><i>"Great! See how using the delay evoked an independent request from your child?"</i></p> <p><i>Corrective statements:</i></p> <p><i>"Remember, once we see the child show interest in the reinforcer, such as reaching for it, we want to use a five second delay, using a prompt if necessary, to evoke a request from the child. Let's try again."</i></p> <p><i>"You provided a good prompt, but remember we want to make use of the five second delay to transfer control of the child's request from the verbal stimulus (our prompt) to the item itself. Let's try again!"</i></p> <p><i>"Hmm, you did a nice job of waiting for five seconds and then delivering the prompt, but it didn't seem that the item was a reinforcer as the child wasn't showing interest in it. Let's do a preference assessment and find a new reinforcer."</i></p>
<p><b>Evaluation</b></p>	<p><i>The technician will be evaluated as follows. Upon child interest in a particular item or activity, the technician will use the time-delay procedure by presenting the item or activity and waiting five seconds. If the child emits a vocalization which resembles the name of the item, the technician will deliver the item. If the child does not emit a vocalization within five seconds, then the technician will provide a vocal model as a prompt and then deliver the item.</i></p>