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Using Video Modeling to Teach Functional Direction Following

Breanna Burns
Western Michigan University, breanna.c.burns@gmail.com

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Abstract

Many children with developmental disabilities have a hard time learning skills, such as following directions, in a small group setting. Video modeling has been shown as an effective way to teach certain skills to children with autism and other developmental disabilities (Nikopoulos & Keenan, 2004; Wu, Cannella-malone, Wheaton et al, 2016). Little research has been done on using video modeling to teach functional directions. Generalizing direction following skills to appropriate contexts is important for children to be successful in the many environments they encounter in a typical school setting. The purpose of this project was to teach functional direction following using peer video models. A simple baseline design was used to measure the effects of video modeling on direction following. During phase one, the videos were shown to the participant once before each trial. Phase two consisted of giving the verbal directions without the video model. During the generalization phase, the verbal direction was given to a group of two to four students in addition to the participant. The results indicated that video modeling was an effective way to teach functional directions to a child with a developmental disability. Future research may include a larger sample size and two-step directions.

Using Video Modeling to Teach Functional Direction Following

Many children with autism and other developmental disabilities have a hard time learning skills the same way a typically developing child would learn. One of those skills is following directions in a small group environment. Little research has been done on functional direction following, even though this skill is necessary for children to have before entering a typical preschool setting. Children with autism are acquiring the simple auditory discrimination skill they are being taught in a discrete-trial setting; however, this skill is not generalizing to other environments that are less restrictive. No research has been found on using video modeling to teach functional direction following. Video modeling has been shown as an effective way to teach certain skills to children with autism and other developmental disabilities (Nikopoulos & Keenan, 2004; Wu, Cannella-malone, Wheaton, & Tullis 2016).

Research has shown peer modeling to be an effective way to teach children with developmental disabilities academic skills they lack and possibly as an effective way to teach generalized social behavior (Ledford and Wolery, 2013). It is likely peer imitation is a prerequisite skill needed for video modeling to be successful, especially when the model in the video is peer. Peer modeling can be beneficial to children learning new behaviors and children modeling the behaviors. Ledford and Wolery (2013) state, “children with and without disabilities may generalize these behaviors to other contexts” which can be beneficial to both children (p. 456). Generalizing direction following skills to appropriate contexts is important for all children to be successful in the many environments they encounter in a typical school setting.

Nikopoulos and Keenan (2004) studied the effects of video modeling on social initiation and reciprocal play. Social initiation was defined as “the child approaching the experimenter, emitting a vocal (e.g., “Let’s play”) or gestural (e.g., taking him by the hands) behavior, and

leading him towards a toy". In this study, children watched a video in one room and were given the opportunity to imitate the model in a different room. The video was recorded in the same room with the same toys the children would encounter. The results showed "video presentation enhanced social initiation and reciprocal play skills, which were maintained at 1- and 3-month follow-ups" (Nikopoulos & Keenan, 2004). Though Nikopoulos and Keenan studied how social skills were affected by video modeling, their results could generalize to direction following.

Wu, Cannella-malone, and Wheaton et al. (2016) used video modeling to teach two teenage boys with developmental disabilities two activities of daily living (ADL). The ADLs, washing a table and washing a window, were taught using different prompt fading techniques. For window washing, fading took place after acquisition, for table washing, fading occurred within the intervention. Results showed that video modeling was an effective way to teach ADLs and that within session prompt fading produced better generalization and maintenance outcomes. This is another skill area that video modeling has been shown to be successful in teaching, making it possible that video modeling is also an effective way to teach direction following.

There may be a prerequisite skill the participant needs for video modeling to be a successful teaching tool. MacDonald, Dickson and Aheam (2015) studied the effects of the prerequisite skill of delayed imitation on video modeling. Their results showed participants who mastered delayed imitation showed higher performance during video modeling than the participants who had not mastered delayed imitation. This may be an indicator that delayed imitation is a skill needed for video modeling to be a successful intervention for teaching children. Due to the delay from the time the video is seen to the opportunity to emit appropriate direction following behavior, it is possible that delayed imitation is a prerequisite skill.

There has been no research found on using video modeling to teach functional direction following to children with autism. Research on video modeling has been limited mostly to activities of daily living and social skills (Wu, Cannella-malone, Wheaton et al, 2016; Nikopoulos & Keenan, 2004). There has also been research on possible prerequisite skills needed for video modeling to be effective (MacDonald, Dickson, & Aheam, 2015). More research needs to be done using video modeling in other areas, including functional direction following.

Method

Participant

The child participating in this study was a 3-year-old male with a language delay. He received 15 hours a week of intensive behavior treatment and had been in the classroom for one year. At the beginning of this study, the participant was thought to be moving to a less restrictive classroom. The participant mastered the classroom basic direction procedure, but did not seem to be generalizing direction following to other directions, environments, or people. In the next classroom, the participant would encounter many directions that differed from the directions taught in the basic direction procedure which made him a good candidate for this study. Inclusionary criteria were having mastered the classroom basic direction following procedure.

Design

A simple baseline design was used to measure the effects of video modeling on direction following.

Procedure

Video modeling was used to teach functional direction following. The videos were of a similarly aged peer and were recorded in the less restrictive classroom, rather than the setting the

intervention was conducted in. *Appendix A* illustrates the procedure. Each session lasted 15-30 minutes and were ran two to three times per week. The independent variable in this experiment was the use of video models. The dependent variable was responding to the directions independently. Interobserver agreement was collected for at least 20% of the trials ran.

Baseline. During baseline, 11 directions were randomly rotated between until responding stabilized (see *Appendix B*). Of these 11 directions, three were chosen to teach using video modeling. A neutral "good" was provided for all responses during baseline.

Phase one. In phase one, the directions quiet hands and line-up were taught simultaneously. The experimenter delivered the laptop with one of the two videos to the participant and said, "let's watch". After the video finished playing, the experimenter removed the laptop and delivered the same S^D as the one in the video. If the participant responded correctly within 10 seconds of the S^D, a highly-preferred reinforcer and praise were delivered. If the participant did not respond correctly within 10 seconds of the S^D, the experimenter represented the video and said, "let's watch". After the video finished, the experimenter removed the laptop and delivered the S^D again. If the participant responded correctly within 10 seconds, a moderately preferred reinforcer and praise were delivered. If the participant did not respond correctly within 10 seconds of the second S^D, a model prompt or another video model was provided. A neutral "good" was provided for a correct response to the model, then two extra learning opportunities (ELOs) were provided and praise was given for correct responses. The directions could phase change independently from each other. When one of the directions moved to phase two, raise hand was added to phase one.

Phase two. Phase two consisted of presenting the directions without the video model. A highly-preferred reinforcer was delivered for correct responses. If the participant did not respond

within 10 seconds of the delivery of the S^D, the video model was provided. A moderately preferred reinforcer was delivered for a correct response following the video model. If the participant still did not respond within 10 seconds of the S^D after the video model, a model prompt or another video model was given. For a correct response to the model, a neutral "good" and two ELOs were given. Praise was used to reinforce the ELOs.

Sub-phases. Five sub-phases were created for phase two for line-up.

Sub-phase 2a. This sub-phase consisted of placing a whole sticker on the wall at the participant's chest height and removing the dot on the floor. The direction was presented without the video model and a correct response consisted of the participant walking over and pointing at the sticker while standing in line. A highly-preferred reinforcer was delivered for a correct response. If the participant did not respond within 10 seconds of the delivery of the S^D, the video model was provided. A moderately preferred reinforcer was delivered for a correct response following the video model. If the participant still did not respond within 10 seconds of the S^D after the video model, a gestural prompt was given. For a correct response to the gestural, a neutral "good" and two ELOs were given. Praise was used to reinforce the ELOs.

Sub-phase 2b. During this sub-phase, half of a sticker was placed on the wall at the participant's chest height. The direction was presented without the video model and a correct response and error correction were the same as sub-phase 2a.

Sub-phase 2c. A quarter of a sticker was placed on the wall at the participant's chest height during this sub-phase. The direction was presented without the video model and a correct response and error correction were the same as sub-phase 2a.

Sub-phase 2d. For this sub-phase, a sticker was not placed on the wall. The direction was presented without the video model and a correct response consisted of the participant walking

over to the wall. A highly-preferred reinforcer was delivered for a correct response. It was not considered incorrect if the student touched the wall. Error correction was the same as sub-phase 2a.

Sub-phase 2e. This sub-phase was the same as sub-phase 2d but after the participant lined up, the direction quiet hands was given to prevent him from touching the wall. A correct response consisted of going to line-up and going into quiet hands. A highly-preferred reinforcer was given for a correct response. If the participant did not respond within 10 seconds of the delivery of the S^D for line-up, the video model was provided. A moderately preferred reinforcer was delivered for a correct response following the video model. If the participant still did not respond within 10 seconds of the S^D for line-up after the video model, a gestural prompt or another video model was given. For a correct response to the gestural prompt, a neutral "good" and two ELOs were given. Praise was used to reinforce the ELOs. If the participant responded correctly to the direction line-up but responded incorrectly to quiet hands, a model prompt was given. For a correct response to the model, praise was given.

Generalization. This phase was used to determine if the directions would generalize a group setting. In this phase, all three directions were rotated between without the video model being presented. Some of the sessions were observed and some were contrived. During observed sessions, the teacher in the small group classroom delivered the S^D to the student in appropriate situations. During contrived sessions, the experimenter delivered the S^D. In both the observed and contrived sessions, there were other children present. A correct response was reinforced with praise and occasionally a highly-preferred reinforcer.

Setting/Materials

The study was conducted at Kalamazoo Regional Education Services Agency's West Campus. Training took place at a small table in the hallway outside of the small group classroom. The recording of video models took place in the small group classroom which contained a play area, a circle area, two tables and a bathroom. Some sessions during generalization were ran in the small group classroom and some sessions were ran in the hallway with other children present. During the intervention, children and adults were present in both settings.

Materials used for this study included: an iPhone, a laptop, iMovie video editing software on a Mac computer, the participant's highly preferred edibles and toys, and classroom materials needed to complete the directions. Data was collected using paper and pencil. *Appendix C* shows the data sheet used for collection. A typically developing child, about the same age as the participant, was the model in the videos.

Results

Functional direction following is an important skill for students to have before entering a typical preschool setting. Children are acquiring simple auditory discrimination skills, but these skills are not generalizing to functional direction following. Video modeling is an effective way to teach these skills. Video modeling increased functional direction following in the participant for all the directions taught. It also may have aided in the generalization of direction following to directions not explicitly taught. During baseline, eleven directions were given and the participant responded correctly on average 21% of the time.

As seen in *Figure 1,* during phase one for the direction quiet hands, there was a decreasing trend in correct responses. There was an increase of correct responses during session one from baseline, but responding then decreased. The participant was moved onto phase two

and responding increased again. The student stayed on phase two until phase change criteria was met, and then moved to the generalization phase. The generalization phase showed quiet hands successfully generalized to different environments and people.

Figure 2 shows responding during phase one for line-up was variable in sessions 7-11. Responding dropped to zero after session 11. During session 15 the model prompt after the 2nd incorrect response was changed to a gestural prompt and responding increased. Sub-phases were added after responding dropped to zero in phase two, but the participant was probed ahead on the sub-phases from 2a to 2d. Phase 2e was not completed and the generalization phase was not ran for this direction due to lack of time.

Figure 3 shows there was only one session run on phase one for raise hand. The participant demonstrated the skill during the first session of phase one after only watching the video before the first time the direction was given. Since the video model was only needed for the first trial of the first session, he was moved to phase two after only one session on phase one. The participant had high rates of correct responding during both phase two and the generalization phase.

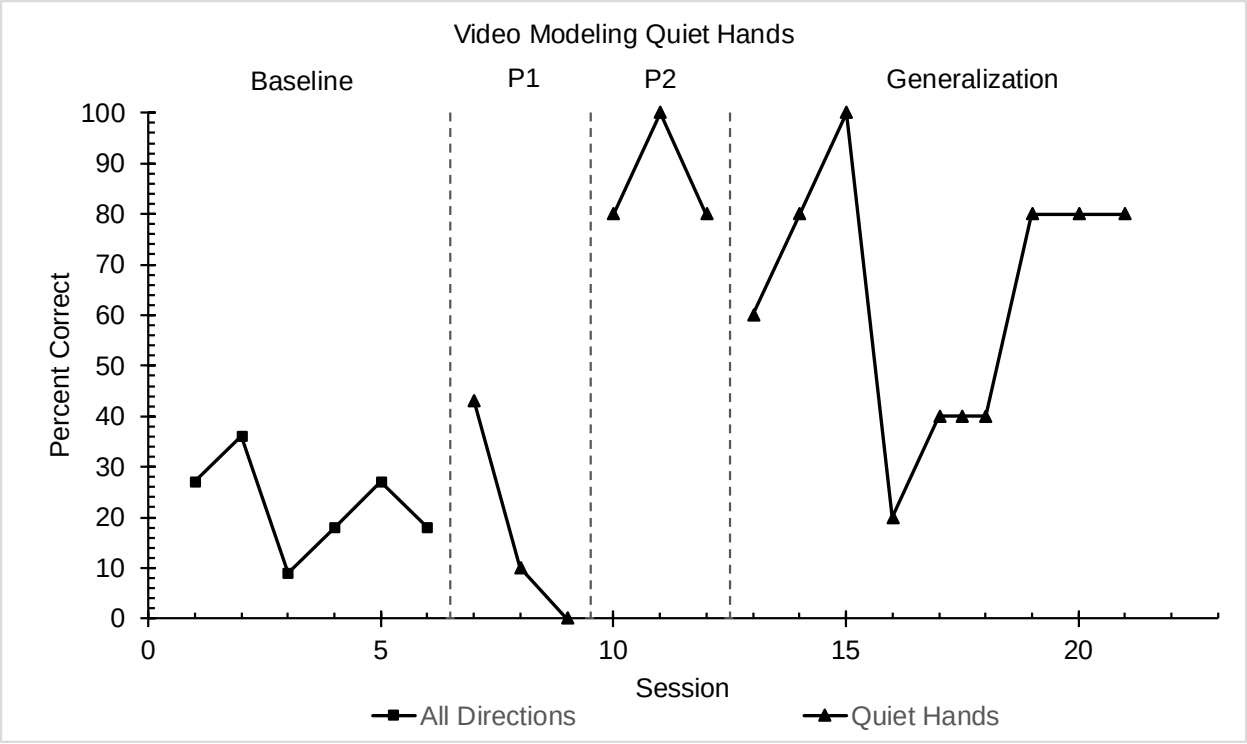

Figure 1. The percentage correct per session for quiet hands.

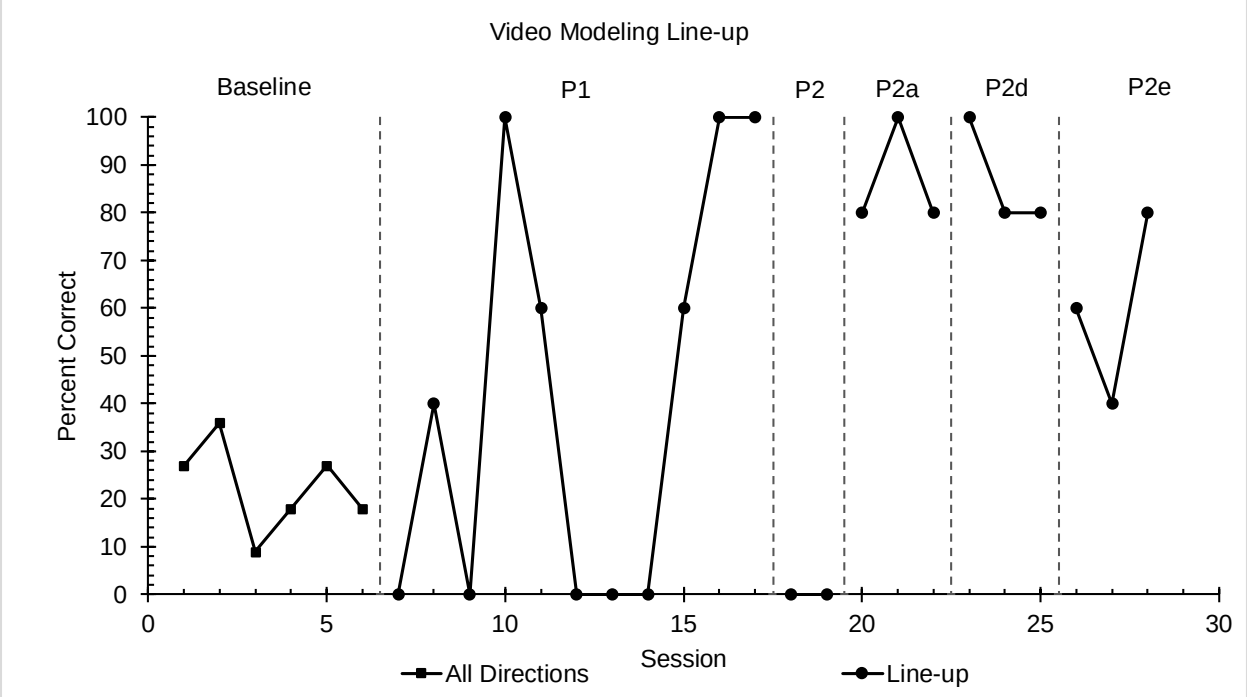

Figure 2. Percentage correct per session for line-up.

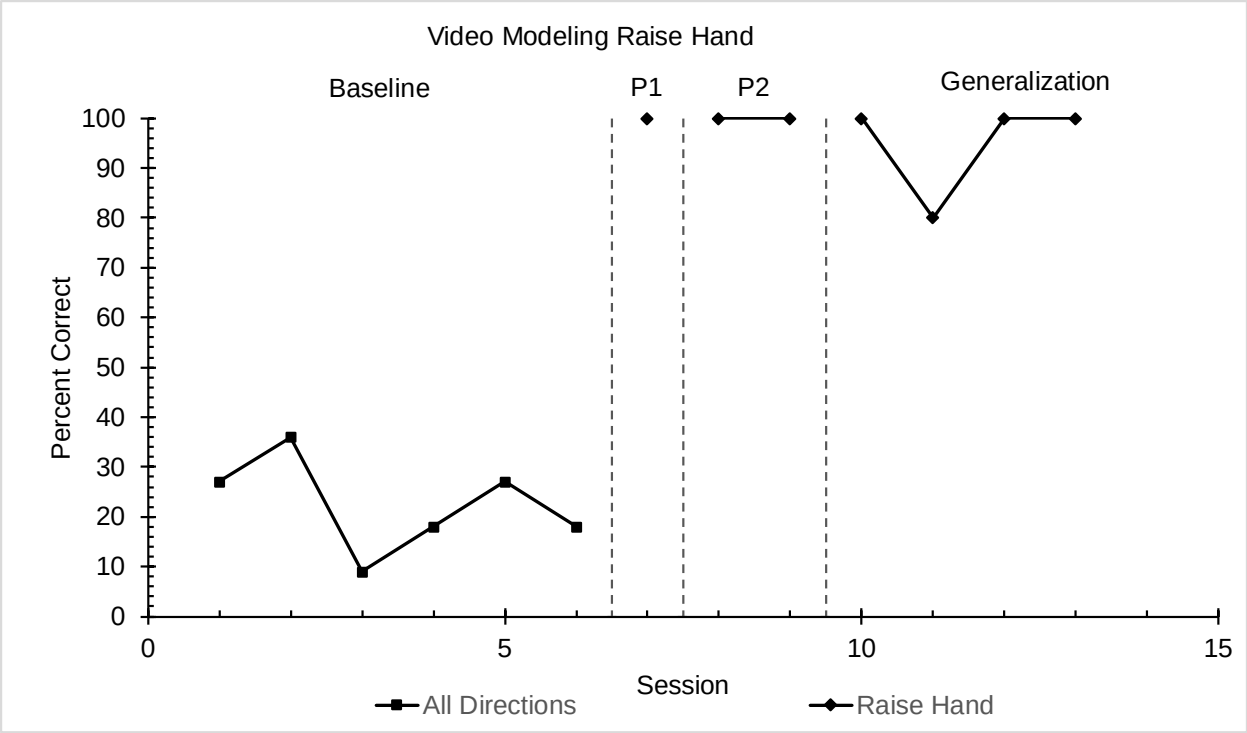

Figure 3. Percentage correct per session for raise hand.

Discussion

Video modeling was successful for teaching the child functional directions in a one-on-one setting; however, additional measures were needed for certain skills to generalize to a small group setting. This may have been because of competing contingencies acting within the small group setting which were controlled for in the one-on-one setting.

Correct responding to quiet hands initially increased from baseline during the first session on phase one; however, there was a decrease in correct responding in the sessions following. In the video model, there was an audible slapping noise on the table when the model went into quiet hands. During the first session, this did not seem to be a problem, but as sessions continued the video started shaping the behavior of slapping the table instead of going into quiet hands. The video was removed and quiet hands was probed without the video model being presented. The

participant demonstrated the skill in the absence of the video. Since the participant did not demonstrate the skill during baseline, it is believed that the video model did effectively teach the skill.

The first three sessions of generalization for quiet hands were run in the DTT classroom with two other children all sitting at a table together. The participant was moved from the DTT classroom to the small group classroom after the third session of the generalization phase. Generalization data was then taken through observation in the small group room or contrived in the hallway adjacent to the classroom. During observation, the teachers and classroom staff would deliver the direction to the participant when it was appropriate. For example, they would say “quiet hands” when the participant was aggressing, swiping materials, or touching other kids. The participant did not respond to the direction during these times. An increase in aggression was noticed after the participant moved to the group room. Since quiet hands was incompatible with aggression, it is believed that the aggression contingency was more reinforcing than the quiet hands contingency. When tested outside of the classroom, the participant demonstrated the skill, even when the direction was given from a distance and in a group setting.

During phase one for raise hand, the video model was shown to the participant once before the first trial. The participant kept repeating the direction to himself and following the direction after the first trial. The direction was probed without the video model and he responded correctly 100% of the time, so he was moved ahead to phase two. He quickly moved from phase two to the generalization phase. Sessions for generalization were ran in the small group classroom during circle time or in the hallway at a table with other peers. This direction was not encountered very often in the classroom which made it difficult to collect data through

observation only. Responding may have been affected by the fact that the participant did not encounter this direction for long periods of time.

Responding for line-up was variable during phase one. A three-week winter break began after session eleven. When school resumed, responding dropped to zero until session 15 where the model prompt after the 2nd incorrect response was changed to a gestural prompt. When the participant moved to phase two, it was noticed that he would walk over to the dot on the floor and touch it, instead of standing on the dot like the video model showed. This may have been shaped up by the gestural prompt during phase one. Sub-phases were put into place, where the dot on the floor was removed and a small sticker was placed on the wall and faded out. Correct responding increased but there was not enough time to finish sub-phase 2e or run the generalization phase due to the school year ending. During the sub-phases, there was generally a peer present which could indicate the skill generalizing to a group setting.

The results of this study show that video modeling is an effective way to teach directions. Some directions may not automatically transfer to a small group setting, while others may. Many children master a basic directions procedure in the DTT setting, but do not demonstrate functional direction following in a group setting. A functional direction following procedure could help those children move from a DTT classroom to a typical preschool classroom and video modeling may be an effective way to teach directions. More research needs to be done with a larger sample size and more directions. Additionally, future researchers could look at whether teaching a small group or teaching individually is a more effective way to use video modeling.

References

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Appendix A

Video Modeling Functional Directions - PROCEDURE SHEET

Pupil:		**Teacher:**	**CJ**
		Procedure Writer:	**BB/SF**
		Date Written:	
IEPC Goal:			
Objective:			
Materials:	**red dot, 3-4 toys, toy bin, visual schedule, student's words, blue cube chair, other chair, laptop with videos**		
Reinforcer:	**Student's most highly-preferred edible.**		
Data collection:	**5 trials for each direction (10 total trials), (+) for correct and (-) for incorrect.**		

Phase	**Tutor Presentation/Preparation**	**Correct Response**		**Incorrect Response**		**Criteria for Change**
		Pupil Behavior	**Tutor Behavior**	**Pupil Behavior**	**Tutor Behavior**	
1	The tutor sits facing the student and establishes eye contact with the student. The tutor says, "Let's watch our video" and plays video of either direction 1 or direction 2. Once the video is over, the tutor establishes eye contact with the student. The tutor delivers the S^D that matches the video they played. Rotate between direction 1 and 2. Once one of the directions has moved to phase 3, add a	Student follows directions within 3 seconds of S^D.	Praise paired with edibles.	Student does not follow directions within 3 seconds of S^D.	Show the video again then redeliver the S^D. If incorrect a second time, use a model prompt.	80% or > for 3 or 90% or > for 2 consecutive sessions. Directions can phase change independently from each other

	new direction starting at this phase.					
2	The tutor sits facing the student and establishes eye contact with the student. **The tutor delivers the S^D for the direction with no video model. Rotate between two directions, regardless if the other direction is still on phase one.** Once one of the directions has moved to phase 3, add a new direction starting at phase one.	Student follows directions within 3 seconds of S^D.	Praise paired with edibles.	Student does not follow directions within 3 seconds of S^D.	Show the video then redeliver the S^D. If incorrect a second time, use a model prompt.	80% or > for 3 or 90% or > for 2 consecutive sessions. Directions can phase change independently from each other
3	**The student sits at a table or in a common area with one or two peers. The tutor sits facing all the students. The tutor delivers the S^D for the direction to the group. Rotate between directions if more than one direction is in this phase.** Once a direction has moved to this phase, add a new direction starting at phase one.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Appendix B

Directions Tested During Baseline

Eleven directions were tested during the baseline phase to determine whether the participant was demonstrating the skill. These directions were chosen because they are directions the participant would be exposed to in a typical preschool classroom, and the participant was not consistently responding to these directions. Any of these directions could be replaced with different functional directions for the procedure.

List A1

1. Line-up
2. Clean up
3. Raise hand
4. Quiet hands
5. Walk to locker
6. Go to bathroom
7. Grab your words
8. Check your schedule
9. Sit down
10. Go to blue cube chair
11. Wait

Appendix C

Data Sheet

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____

Direction:			
Trial	Data	Correction	Date
1		V M	
2		V V	Initials
3		V M	
4		V V	IOA?
5		V M	Y N

%_____