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The use of video modeling to teach staff to implement discrete trial sessions

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**The Use of Video Modeling to Teach Staff
to Implement Discrete Trial Sessions**

A Thesis Presented

by

Emily Shapiro

The Department of Counseling and Applied Psychology

In partial fulfillment of the requirements

For the degree of

Master of Science

In the field of

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Department: Counseling and Applied Educational Psychology

Approved for Thesis Requirements of Master of Science Degree

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Abstract

The purpose of the current study was to determine if a short video would be an effective training strategy to teach staff at a private school for children with autism to implement a discrete trial session. The participants were 3 new teacher's assistants at the school. During baseline the participants were asked to perform a discrete trial session, with the materials provided, to the best of their ability. Training consisted of a 3m 17s video depicting an experimenter implementing a discrete trial session without a voiceover. Data was collected on 10 discrete trial components using the discrete trial checklist described by Catania et al. (2009). Results indicated that the video was an effective method for training staff to implement a discrete trial session. All 3 participants increased their accuracy implementing the discrete trial skills and met mastery criteria within 6 sessions of watching the video.

Teaching staff members to accurately implement an educational procedure or behavioral intervention in schools for children with disabilities is essential. In particular, the structure and continuity of teaching methods among staff members in a classroom may lead to more positive outcomes for the individual being served (DiGennaro et al. 2007).

The extent to which staff members implement procedures as they have been trained is referred to as treatment or procedural integrity (Noel et al. 2000). Research on procedural integrity demonstrates that low procedural integrity correlates with decreased student performance (DiGennaro et al. 2007).

DiGennaro et al. examined whether treatment integrity of special education teachers was effected by goal setting, performance feedback regarding student or teacher performance, and a staff meeting cancellation contingency. The participants were taught to implement function-based treatment packages for students' problem behaviors.

In the first condition, the teacher set a goal for a student's behavior and received daily written feedback about the student's performance. In the second condition, the first condition procedures were implemented, however; an avoidance contingency was included in which the teacher could avoid a meeting with a supervisor if the teacher implemented the procedures with 100% integrity.

The results indicated that the second condition was the most effective in increasing the teacher's treatment integrity and decreasing students' maladaptive behaviors. All participants rated the feedback package highly acceptable.

Lafasakis and Sturmey (2007) taught parents to implement discrete trial instruction for their child with developmental disabilities. The experimenter gave the parents a list of 10 discrete trial components then described each component. During baseline, the parents sat with their child and performed 3 discrete trials. During training, the experimenter provided the parents with a combination of verbal feedback, modeling, positive feedback, and performance feedback regarding their implementation of each of the components. Results indicated that the training package effectively taught the parents to implement discrete trial teaching. Additionally; the parents' skills generalized to new programs and the children's correct responses increased.

In addition to face-to-face instruction, video modeling has been shown to be an effective strategy to teach a variety of instructional skills. These skills have enabled care providers and teachers to enhance gymnastics skills (Boyer et al. 2009), prevent back injuries of hospital nurses (Nielsen, Sigurdsson & Austin 2009), increase the problem-solving of adults with developmental disabilities (Collins, Higbee & Salzberg 2009), and improve the treatment integrity with which staff members implement behavioral interventions (DiGennaro-Reed et al. 2010).

Moore & Fisher (2007) compared lectures and two types of video modeling to determine which one was more effective in teaching staff members to implement functional analyses. The participants were asked to perform the attention, demand and play conditions of a functional analysis (Iwata et al. 2000). The conditions were implemented with an experimenter serving as a client (simulated) and an actual client (real). The primary dependent variable was the percentage of the participants' correct responses.

Training consisted of written materials, lecture materials, and video depictions. The written material was a description of the functional analysis, the lecture was a PowerPoint presentation about a functional analysis, and the video depicted the implementation of a functional analysis. Half of the participants watched a complete video model including a depiction of the procedures in which all the possible therapist behaviors were shown. The second half of the participants watched a video that showed approximately 50% of both the client and therapist behaviors.

The results indicated that the participants' skills improved slightly with both the written materials and lecture, but that they did not meet mastery criteria. On the other hand, participants who viewed the complete video evidenced large improvements in performance as compared to those who viewed the partial video model. Limited research has been published regarding the use of video modeling to train discrete trial instruction, which is the primary method for teaching language and communication skills to children with autism (Koegel, Russo & Raincover, 1977).

Catania et al. (2009) used video modeling to train three direct care staff of a private institution for individuals with autism to implement discrete trial instruction. The baseline procedures included giving the participants a short explanation of the parts of a lesson plan and the materials to implement a match-to-sample task. The individuals were instructed to teach the simulated student (experimenter) using the lesson plan and materials presented.

Training consisted of a 7m 15s long videotape showing two experimenters simulating a teacher and a student completing a match-to-sample task. Eleven discrete trials were depicted on the videotape, which included a voiceover that gave an

introduction and an explanation of the teaching skills. Within 10 minutes of watching the video, the participants were instructed to complete discrete trial training in situations that were the same as those present in baseline. To demonstrate generalization of the teaching skills, the participants subsequently taught receptive and expressive tasks without watching the video again. Additionally, a 1-wk follow-up probe was conducted to test for maintenance skills. Results from Catania et al. indicated that video modeling is an effective and efficient method for teaching staff to implement discrete trial training.

The purpose of the current study is to replicate and extend the methods of Catania et al. (2009). A comparatively shorter video that did not contain a voiceover was used to train new staff at a school for children with autism to implement a discrete trial session.

Method

Participants

Three newly hired female assistant teachers working at a private school for children with autism participated in the study. Their ages ranged from 22-27 years old. All participants had their bachelor's degrees and Participant 3 had completed some graduate work. Participant 1 had some experience providing Articulation Therapy, Participant 2 had 1.5 years of ABA work experience, and Participant 3 had some Special Education work experience.

During their first week of work, the participants completed a school-wide orientation that included an overview of the corporation, workplace safety, The Health Insurance Portability and Accountability Act training, Basic First Aid, and Cardiopulmonary Resuscitation training. Additional school-specific trainings such as

ABA, medication, and disaster drills were also provided. During the ABA training, a short video showing the implementation of a discrete trial session was shown.

Settings and Materials

The study was completed in an office at the school with a large table and chairs and began during the first 2 months of the participants' employment. Two experimenters were present in the room along with the participant when sessions were conducted.

A 3m 17s videotape depicting implementation of a match-to-sample discrete trial session was the primary training tool used during the study. The video showed an experimenter delivering 11 match-to-sample trials in which the stimuli (the numbers 1-3) were presented in a horizontal array approximately 5cm apart on a tabletop (Catania et al. 2009). The teacher presented the sample stimuli and gave the instruction to "match." The "student" was a second experimenter.

Design and Measurement

A delayed multiple baseline design was used that included four conditions; baseline, training, generalization, and maintenance. The measurement tool was the discrete trial checklist described by Catania et al. (2009) (Appendix A). The participants' performances were assessed for 10 discrete-trial skills. The percentage of correct performance skills was calculated by dividing the total number of behaviors performed correctly, by the total number of skills on the performance checklist, and then converting the score to a percentage.

Procedure

Baseline. The participants were given a short-term objective sheet outlining how a specific match-to-sample, discrete trial task should be completed (Appendix B). This

sheet included the student's IEP objective, required materials, discriminative stimulus to be given, response definitions, performance criteria, and procedures for baseline, training, generalization, and maintenance conditions. Additionally, procedures for inter-observer agreement, teacher behavior, student behavior, and the specific stimulus set were described. The experimenter allowed the participants 10m to look over this sheet prior to completing the task. The participants were also provided a data sheet and the materials for completing the task (two sets of cards with the numbers 1, 2, and 3 printed on them). The experimenter then asked the participants to use the short-term objective sheet and materials provided to perform the discrete trial session.

During the session, the experimenter served as the student and intentionally made 4 correct responses, 3 incorrect responses, and 3 no-responses during the discrete trial session; the number of responses was generated randomly. Data was collected on each component of the discrete trial.

Video modeling. The participants watched the 3m 17s video. Within 10 minutes after watching the video, as in baseline, participants were asked to implement a discrete trial session (Catania et al. 2009). Video modeling was repeated until the participant reached 90% accuracy or higher for 3 consecutive sessions. The participants watched the video and were given the short-term objective sheet and materials needed prior to implementing the session in the video-modeling phase. Data was collected on each component of the discrete trial.

Generalization. A single generalization probe with a student at the school was implemented during the baseline and video modeling phases. The sessions were identical to the baseline and video modeling conditions, however; the participants implemented the

discrete trial session with a student at the school. The participants watched the video and were given the short-term objective and materials needed prior to implementing the session in the video modeling generalization phase. Data was collected on each component of the discrete trial.

Maintenance. A maintenance probe with the experimenter as the “student” was completed 1-week following training to evaluate the extent to which the teaching skills were maintained over time (Catania et al.). During this probe the participant was asked to implement a discrete trial session in the absence of video modeling. The sessions were identical to baseline in which the participants were given the materials needed to complete the session and asked to perform a discrete trial session.

Interobserver agreement. Interobserver agreement data were collected during 41% of baseline sessions (M=86%; range, 67% to 100%), during 53% of video modeling sessions (M99%; range, 90% to 100%), and during 33% of follow-up sessions (100%).

Results

Figure 1 represents the percentage of discrete trial skills that the three participants performed correctly in each condition of the study. During the baseline phase, the first participant exhibited the skills accurately on 32.5 percent of the sessions. During the generalization probe, in which the participant implemented the discrete trial procedures with a child at the school, the participant scored similarly, achieving 30 percent accuracy.

When video modeling was implemented, Participant 1’s accuracy increased to 88 percent. She then achieved 100 percent accuracy during the generalization probe and 1-week follow-up, which was conducted without video modeling.

During the baseline phase, Participant 2 accurately completed 10 discrete trial components on 38 percent of occasions. During the generalization probe, this percentage increased to 50. After video modeling was introduced, Participant 2 attained 88 percent accuracy during training and 100 percent accuracy on the generalization probe. Her accuracy remained at 90 percent during the 1-week follow-up.

During baseline, Participant 3 achieved an average overall accuracy of 57.5 percent, which was higher than the other two participants in the same condition. Additionally Participant 3 attained 40 percent accuracy on the generalization probe. When video modeling was implemented, the participant's accuracy did not initially increase. An error analysis showed that Participant 3's errors had no systematic pattern; however, after the second implementation of video modeling her accuracy increased to an average of 93 percent demonstrating that she had mastered the discrete trial skills. The participant also implemented the discrete trial components with 100 percent accuracy during the generalization probe and 1-week follow-up test.

Figure 2 shows the analysis of Participant 1's errors for each condition. During baseline, the participant incorrectly performed 6 of the discrete trial components each of the times that they were presented. These included, "establishing ready behavior", "waiting for ready behavior", "presenting choice stimuli as specified in the lesson plan", "providing prompt level consistent with the lesson plan", "conducting a correction trial" and "removing stimuli prior to the start of the next trial". Three of the components were performed incorrectly 25 percent of the times they were implemented. These included, "delivery of the reinforcer as specified by the lesson plan", "not reinforcing correct responses" and "accurately recording data".

During the video modeling phase, Participant 1 implemented 2 of the components incorrectly, “establishing ready behavior” and “waiting for ready behavior”, 33 percent of the times they were implemented. Additionally, she implemented 3 other components; “presenting choices or stimuli as specified in the lesson plan”, “conducting correction trial” and “accurately recording data”, incorrectly 17 percent of the times they were implemented.

Figure 3 shows the error analysis for Participant 2. The graph shows the percentage of incorrect components for baseline, video modeling, and follow-up phases. During baseline, Participant 2 incorrectly implemented 4 discrete trial components 100 percent of the time they were conducted. These included, “establishing ready behavior”, “waiting for ready behavior”, “providing prompt level consistent with the lesson plan”, and “conducting correction trial”. Two components, “accurately recording data” and “removing stimuli prior to the start of the next trial”, were implemented 80 percent of the time. One component, “not reinforcing incorrect responses”, was implemented incorrectly 40% of the time. An additional component, “delivering the reinforcer as specified in the lesson plan”, was implemented incorrectly 20 percent of the time.

During the video modeling phase, Participant 2 incorrectly implemented 1 component, “waiting for ready behavior”, 80 percent of the time and an additional component, “establishing ready behavior”, was implemented incorrectly 40 percent of the time. During the follow-up session, the participant failed to “wait for ready behavior”, but implemented all other components correctly.

Figure 4 presents the error analysis for Participant 3. The graph shows the percentage of components performed incorrectly for baseline, video modeling and

follow-up phases. During baseline, Participant 3 performed 2 of the components incorrectly every time they were implemented. These included, “waiting for ready behavior” and “removing stimuli prior to the start of the next trial.” One of the components, “establishing ready behavior”, was implemented incorrectly 88 percent of the times it was implemented. An additional component, “accurately recording data”, was implemented incorrectly 25 percent of the time they were implemented. “Providing prompt level consistent with lesson plan”, “conducting correction trial”, “stating S^D as specified” and “does not reinforce incorrect responses”, were implemented incorrectly 13 percent of the times they were implemented.

During the video-modeling phase, Participant 3 implemented 3 of the components incorrectly 25 percent of the times they were implemented. These components were, “waiting for ready behavior”, “providing prompt level consistent with the lesson plan”, and “delivering reinforcer as specified in the lesson plan.” During the follow-up session, all components of the discrete trial session were implemented correctly.

Discussion

The results indicate that a 3m 17s video is an effective method for teaching staff to implement a discrete trial session. Within only a few sessions, all three participants increased to mastery level performance and these levels of high accuracy were maintained during the generalization probes and 1-week follow-ups. There was no feedback or consequence delivered to the participant for modeling the behavior shown in the video; however, the participants' accuracy increased to these high levels.

One limitation of the current study is the delayed multiple baseline across participants design. The design has more limited experimental control because not all of

the baselines were started on the same day, therefore another environmental factor could have influenced the accuracy with which the participants implemented the sessions.

Another limitation is the short interval of time between watching the video and implementing the discrete trial session. It is not clear whether a longer interval would have produced less increase in accuracy.

Future research could focus on student performance such as increasing acquisition rates or decreasing maladaptive behaviors. Having fewer opportunities to watch the video could also be examined because in an applied setting it is difficult to remove staff from the classroom for training opportunities. Increasing the time interval between training sessions and the maintenance probe could also be a factor to investigate to determine if the accuracy remains high over a longer period of time. A future examination could also use video modeling to train other types of instruction such as chaining or shaping, or other kinds of discrete trial instruction such as receptive or expressive identification.

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Appendix A:

Discrete Trial Checklist

When completing a discrete-trial instruction session, does the individual complete the following skills

1. Establishes ready behavior.	
2. Waits for ready behavior.	
3. Presents choices or stimuli as specified in the lesson plan.	
4. States SD as specified in the lesson plan.	
5. Provides prompt level consistent with the lesson plan.	
6. Delivers reinforcer as specified in the lesson plan.	
7. Does not reinforce incorrect responses.	
8. Conducts correction trial.	
9. Accurately records data.	
10. Removes stimuli prior to start of the next trial.	

Appendix B:

Short Term Objective Sheet

		<u>Target Skill: Match to Sample</u>	
<u>IEP Objective:</u> The student will match to sample with 90% independence and accuracy for 3 consecutive sessions.			
<u>Massachusetts Curriculum Frameworks Strand; Standard:</u>			
<u>Required Materials:</u> program materials: Cards with numbers (1-3), data sheet, writing utensil, reinforcers. student specific reinforcers: verbal praise, small edible		<u>Data Collection:</u>	
<u>Discriminative Stimulus S^D:</u>		+	correct, independent
“Match.”		-	incorrect, independent
<u>Response Definitions:</u>		+p	correct, with prompt
<i>The student matches the sample stimulus to the comparison stimulus in the array.</i>		-p	incorrect, with prompt
		NR	no response within 5 seconds of S ^D
<u>Performance Criteria:</u>			
Criteria to increase level: 9 out of 10 CORRECT and UNPROMPTED for 3 sessions			
Criteria to increase step: 9 out of 10 CORRECT, PROMPTED or UNPROMPTED for 1 session, increase step next session			
Criteria to decrease step/ level: 7 out of 10 or fewer CORRECT, PROMPTED or UNPROMPTED for 1 session, decrease step next session			
Correction procedure: If the student responds incorrectly or does not respond within 5 seconds of the S ^D , remove materials for 3 sec. and remove eye contact for 2-3 seconds. Record a (-) for the incorrect trial or a (NR) for the no response. Re-present trial and immediately provide full prompting. Do not record data for the correction trial.			
<u>Procedures:</u>			
<u>Baseline (B):</u> Staff should present initial S ^D . DO NOT PROMPT or REINFORCE DURING BASELINE. Record a (+) if the student performs the correct response as identified in the response definition section above. Record a (-) for any other response. Run 3 sessions of baseline. If 9/10 or better CORRECT and INDEPENDENT, record mastery of this stimulus set below in the target section and begin baseline for a new stimulus set. Otherwise, begin training this stimulus set. Baseline each set of stimuli before beginning training of that set.			
<u>Training (T):</u> <i>Level 1: Match to Sample</i> <i>Step 1: 0 second delay of full gestural prompt to target</i> <i>Step 2: 2 second delay of full gestural prompt to target</i> <i>Step 3: 4 second delay of full gestural prompt to target</i> <i>Place stimuli in an array of 3.</i> <i>Record each response on the data sheet.</i>			
<u>Generalization (G):</u> The student will conduct the matching to sample task in a novel environment with novel staff (i.e. with 9 out of 10 correct and unprompted for three consecutive sessions).			
<u>Post-Check (P):</u> Once the student has mastered skill in generalization, this skill should be run once per week with 9 out of 10 correct and unprompted for three consecutive weeks.			
<u>Inter-observer Agreement (IOA):</u> A second staff person will observe and collect data once every 2 weeks.			
<u>Teacher Behavior:</u>		<u>Student Behavior:</u>	
Teacher gains the student’s attention and... <i>Level 1: Presents comparison array, sample stimuli, and the S^D.</i>		Student attends to teacher and ... <i>Level 1: matches correct sample stimulus to the comparison from array</i>	
Teacher follows correction procedure as identified above.		<i>Level 1: matches incorrect sample stimulus to comparison array OR does not respond within 5 seconds of S^D.</i>	

Figure Captions

Figure 1: Percent accuracy of discrete trial components implemented for Participant 1, 2, and 3.

Figure 2: Percent of incorrect discrete trial components implemented for Participant 1.

Figure 3: Percent of incorrect discrete trial components implemented for Participant 2.

Figure 4: Percent of incorrect discrete trial components implemented for Participant 3.

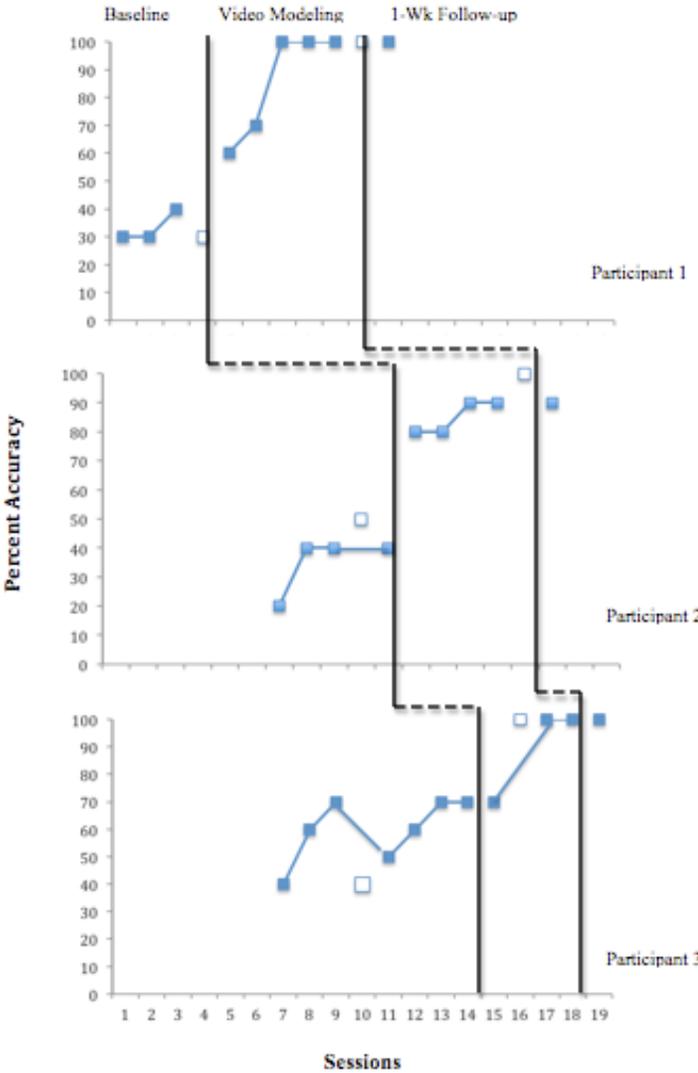


Figure 1

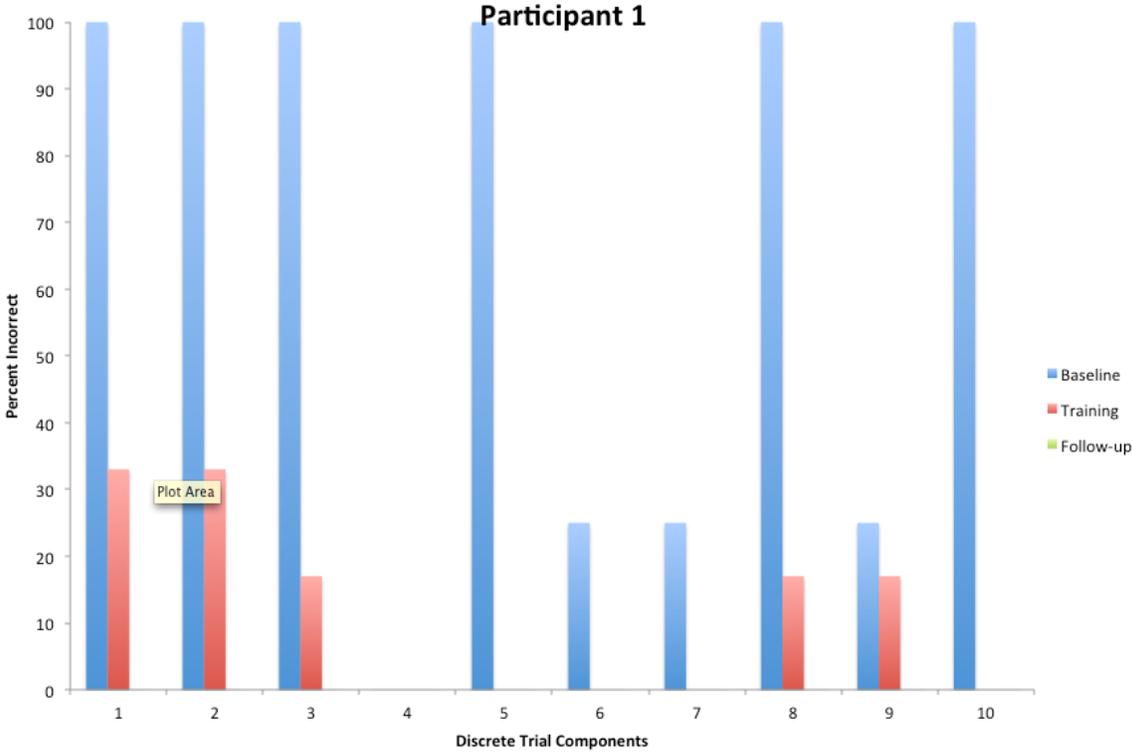


Figure 2

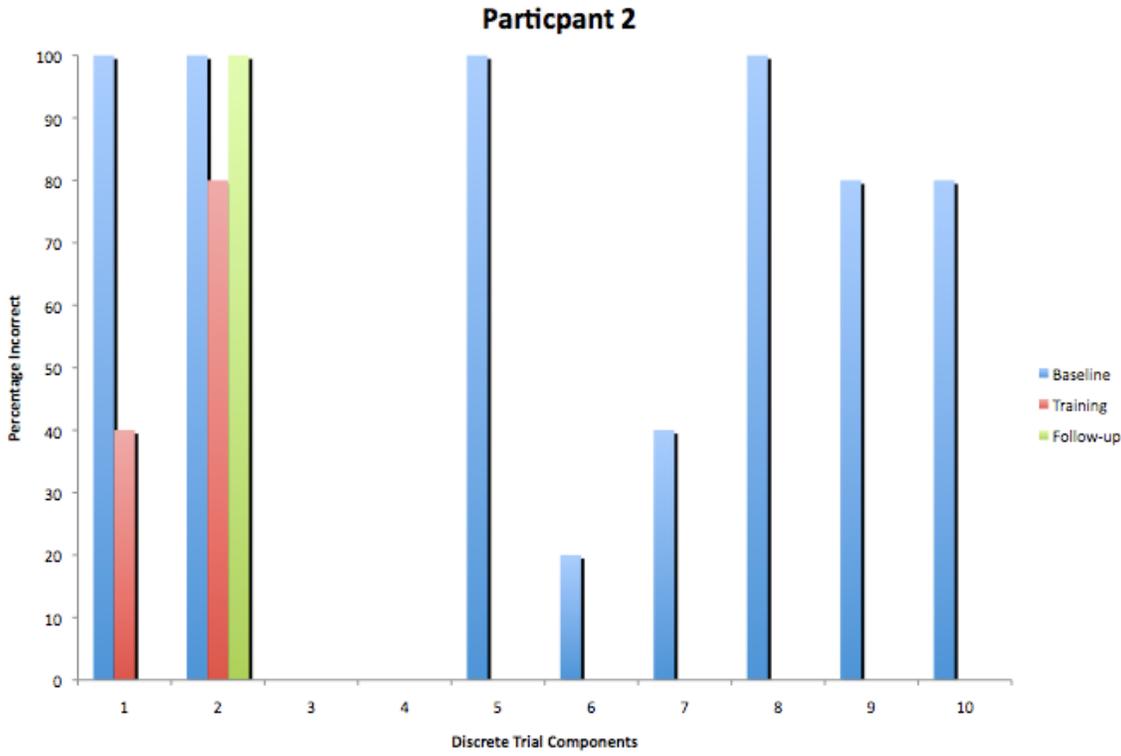


Figure 3

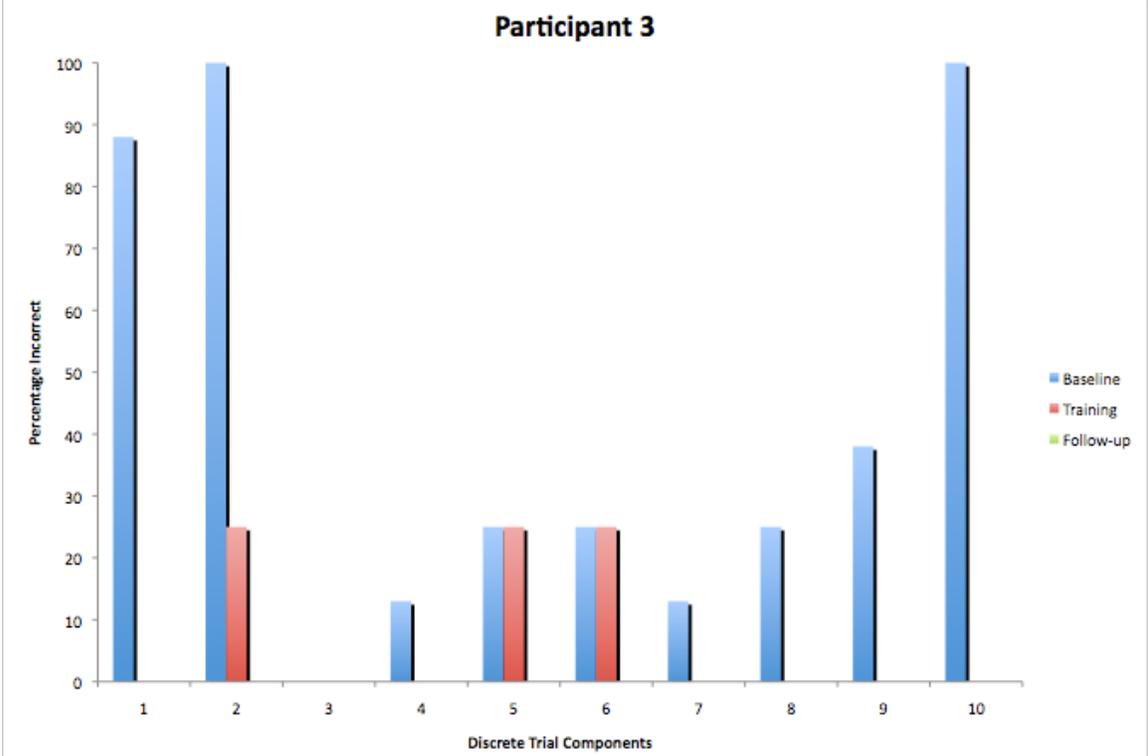


Figure 4