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Explicit Programming for Icon Rings: Visual-Based Discrimination

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Explicit Programming for Icon Rings: Visual-Based Direction Following

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Abstract

Instructional icons are helpful as basic direction following is the basis for complex skills needed later in life. These instructions should have a good training so that children can get the basic skills and can move on to the complex skills. The goal of the project was to increase the correct responses to instructional icons. Visuals are a good tool for learning because it attaches a picture with the event that is happening or will happen. Children with autism sometimes struggle when they are introduced to a new environment so having a system in place to help make instruction following easier is important. The research design used in the project was an AB design. This project was important because it advanced the knowledge of behavioral analysis by showing how having a set training program for visual aids can help make following instructions easier. It also helped because the child can start to generalize these skills to the outside world and this helps the parents take their kids more places with less problems. Lastly, it helped the child because this helped them expand their repertoire and instruction following skills which sets the basis for the rest of their life. The results were that the instruction icons “sit down” and “stand up” were successfully trained.

Introduction

One key issue that children on the autism spectrum face is instruction following skills. One of the reasons we need to focus on instruction following skills is because "Students with autism spectrum disorders (ASD) characteristically demonstrate inflexible adherence to specific routines…" (Lequia, Wilkerson, Kim, and Lyons 2014, p. 146). Having a good instruction following program can help with compliance during those routines because it gives children the initial ques that a new activity is about to begin. The best way to have a good instruction following program is to include visual-based direction following.

It is stated by Siegel and Lien (2014) that "One type of AAC [augmentative and alternative communication] intervention that may be beneficial to individuals with ASD can be provided with visual scene displays (VSDs). These displays depict people, actions, or objects associated with specific events or activities" (p. 100). These programs are now widely used in autism programs. For example, at Kalamazoo Regional Educational Service Agency (KRESA) a center that works with developmental disabilities including autism the tutors in the autism area present directional icons on an icon ring daily to help the students can discriminate between the directions being given. Some of the icons that are presented include a bathroom icon with the picture of a toilet, a booth icon with the picture of what their booth looks like, a lunch icon with the picture of food, and a locker icon with the picture of a locker. These icons help the children to have a visual of where they are going or what activity is about to occur. Discrimination is key because discrimination skills is a part of basically all cognitive, communication, social, academic, work, and self-care skills (Green, 2001).

The system that is in place is a good basis but there needs to be a stronger training of the icons so the child can be able to discriminate between the stimuli appropriately and correctly

follow instructions. The purpose of this project is to set up a detailed intervention with children on the autism spectrum to increase good discrimination and appropriate instruction following skills in a classroom setting as these are the basis for a lot of skills needed in the future. Once we have a strong intervention for a classroom setting, we can focus on generalization to outside the classroom.

Method

Participants

Only one child was chosen for this project. This child was chosen based on his discriminatory skills and attending behavior; the child also could not have been prone to problem behavior. Other inclusionary criteria were also that the child was diagnosed with a developmental disability and was between 2 years old and 4 years old. The criteria for the project was chosen because the child had to be able to discriminate between the icons on the icon ring. The criteria were not gender specific.

Design

An AB design was used; an AB design is where baseline is run for a few sessions and there is no reinforcement or correction and then intervention is run and there is reinforcement for correct responses or a correction procedure for incorrect responses. The study was run for about two months only during school days, where a session or two were run on two or three days out of the five-day week. The procedure was to say the S^D (discriminatory stimulus) for the phase along with the two other directions and to reinforce if they responded within 3 seconds or use prompts if they did not respond within 3 seconds, but only for the direction that was focused on in that phase including the direction in the previous phase(s). For

example, during Phase 1 the S^D "Sit Down" was presented and reinforced or prompted while "Stand Up" and "Walk" were only presented and no correction was given. This procedure was used for the first three phases which were Phase 1: Stand Up, Phase 2: Sit Down, and Phase 3: Walk. A shaping procedure was also used once it became necessary to obtain correct responses.

Shaping is used to get a target behavior by reinforcing behaviors that approximate the target behavior. The way that shaping was used was that the 10-trial data method was stopped and timed sessions were run in which the icon ring was faded in. The amount of time put in to the shaping sessions totaled 2 hours before Phase 1 data was taken again and 30 minutes before Stand Up intervention began. The sessions were run with Sit Down being the S^D and Stand Up being the S-Delta; this means that Sit Down and Stand Up were presented and both were given reinforcement if H correctly responded. The icon ring was faded in by starting the presentation of the icon ring at H's waist level while saying the verbal prompt, then once responding was consistent the icon was moved up to H's chest level while giving the verbal prompt, and once responding was consistent again the icon was presented at H's eye level while saying the verbal prompt. This caused responding to be correct almost every time the S^D was given and Phase 1 data was started again.

The independent variables were the procedure described above. The dependent variable was the percentage of correct responses within the 10 trials for each target with a 30-trial session. Trial-by-Trial Inter-Observer Agreement (IOA) was used to make sure the most accurate data was taken. The normal phase change criteria for KRESA was used, that criteria were 80% or above for 3 consecutive sessions or 90% or above for 2 sessions. Also, the normal whistle-blow criteria were used, which was 50% or below for 5 consecutive sessions or 20 sessions with no phase change. Lastly, if the student did not make a correct response then we also used a 3-step

hierarchy error correct procedure that consisted of using a gestural prompt, then a partial physical prompt if gestural did not work, and finally a full physical prompt if a partial physical prompt did not work; it was considered as an incorrect response if the child needed these corrective prompts to complete the response.

Settings and Materials

The study was conducted in an early special education classroom through KRESA. The classroom the project was run in contained an area with tangible reinforcers where kids can pick reinforcing toys, booths for students, a table for breakfast and lunch with chairs around it, lockers for the student's backpack and jacket, and bathroom suited for young children. The procedure materials used in the project included the written procedure and the icons: stand up, sit down, and walk (see Appendix A). 30-trial sheets were also used which consisted of boxes where the target behavior could be put in on the left, correct or incorrect responses could be marked in the middle, and what level of prompting was needed if the child acted incorrectly was on the right (see Appendices B, C, D, and E). It also had space on the side to write a percentage for each 10-trial session for each behavior. A treatment integrity form was used in which a graduate student watched a run through of baseline and determined if it was run with fidelity (see Appendix F). The child's reinforcers included any tangibles (toys) that were reinforcing, an iPad©, and a paper and pen for coloring.

Results

The reason for the intervention was to explicitly train on the instruction icons within the icon ring at KRESA. The research that was conducted was significant to improving the correct responses to instructional icons and helping not only the tutors at KRESA but the parents of the

children. The child who participated, H, did not improve through my initial training of using least-to-most prompting for Phase 1, the prompting being the 3-step hierarchy mentioned before. Also, H had some motivation issues, meaning it was hard to get him to respond correctly because he was not highly motivated to get his toys so we started using an iPad© and coloring as his main reinforcers and this helped with the motivation problem. There were no correct responses during baseline and when Phase 1 started there was only one correct response in one session so H whistle-blowed, and a new procedure was needed to get correct responses (see Figures 1 and 2).

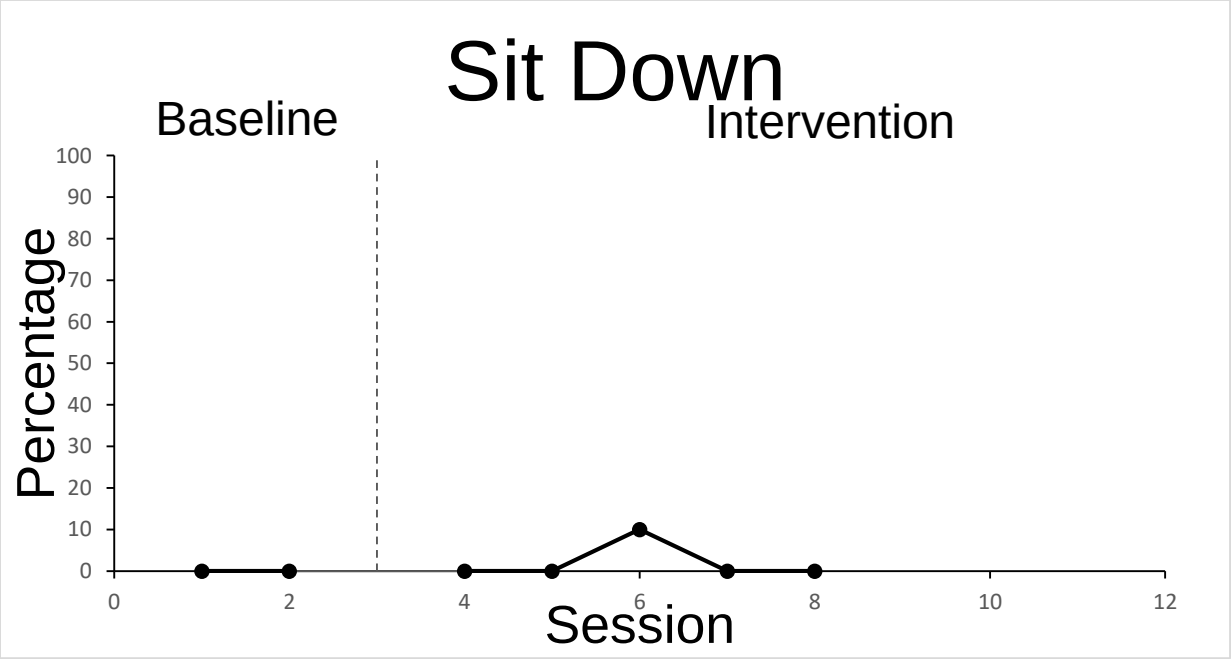

Figure 1. The percentage at the end of each 10-trial session during Baseline and Phase 1 before shaping was conducted.

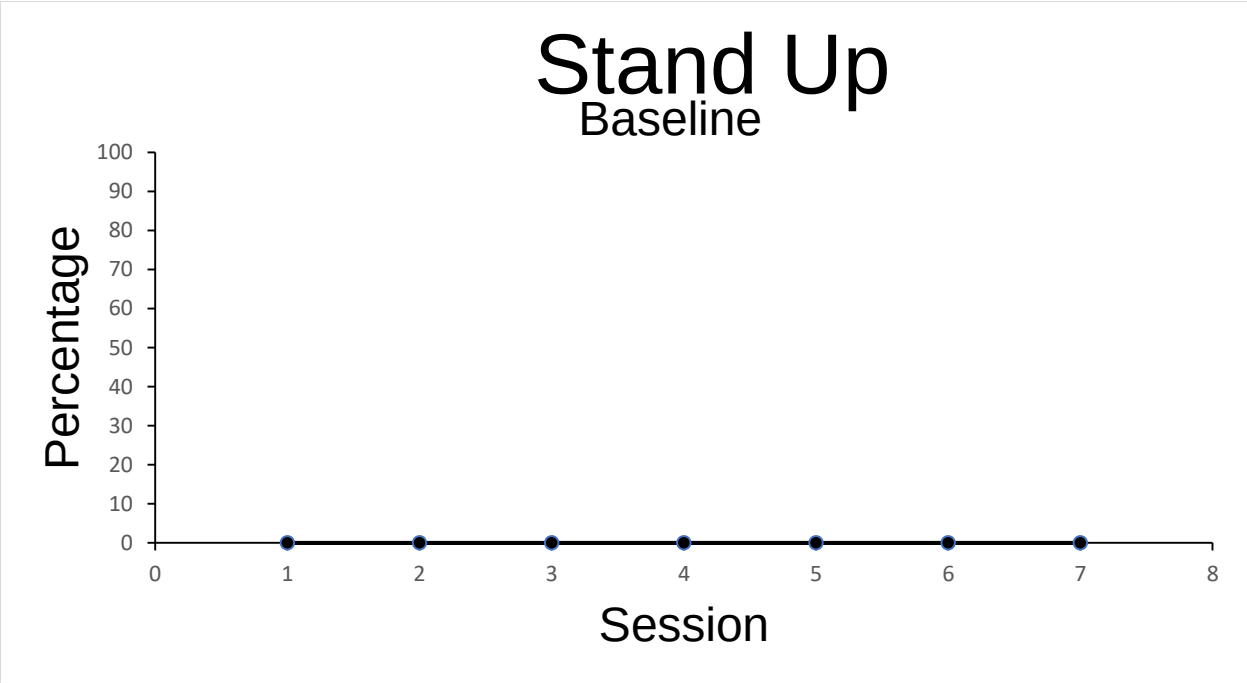

Figure 2. The percentage at the end of each session taken during baseline before shaping was conducted.

The reason that there were no correct responses in the intervention was because H was only attending to the icon being presented and not to the verbal S^D; when the verbal S^D was presented alone H would follow direction every time so it was decided that shaping would be used to fade in the visual S^D to get correct responses. Once the 10-trial data was taken again H phased changed within 3 trials and Phase 2 was started (see figure 3). After putting so much time into Phase 1, there was very little time left for Phase 2 so only 30 minutes of shaping was given for Stand Up after Phase 2 started and only 3 sessions were run but H responded correctly at least 70% of the time each session (see figure 4). Lastly, only baseline was taken for walk and walk was not affected by shaping (see figure 5). The percentages show that this program was successful in getting correct responses to verbal and visual directions, and had there been more time the H would likely have phase changed to Phase 3.

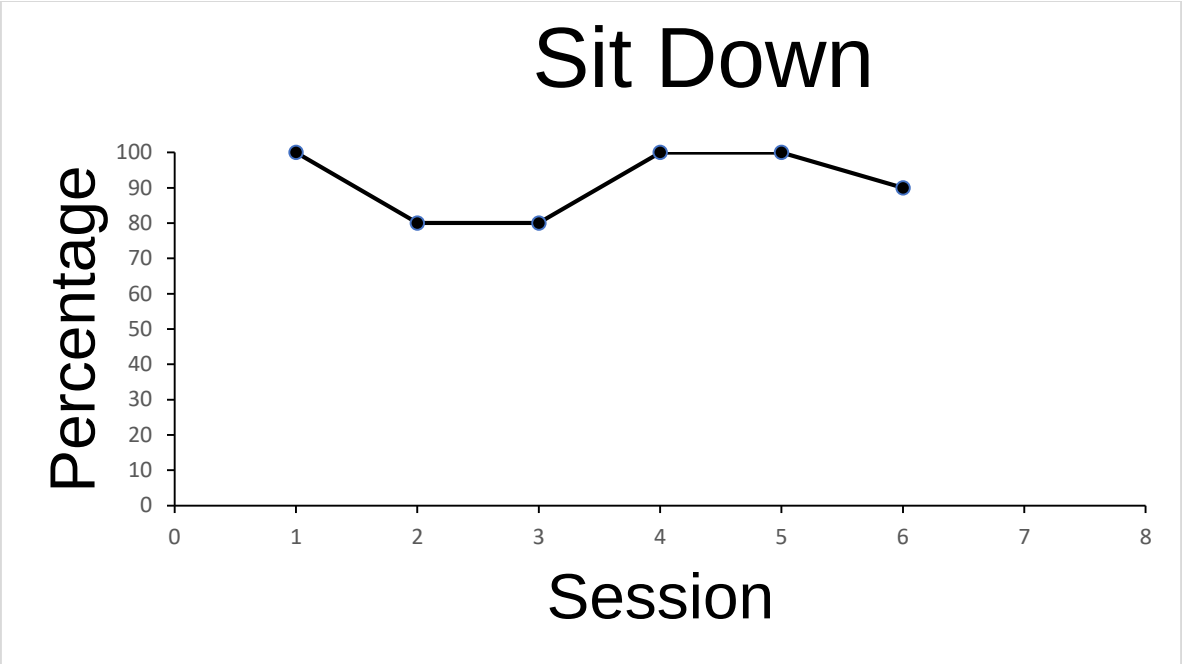

Figure 2. The percentage at the end of each session of Sit Down taken after shaping was conducted. The first three sessions were during Phase 1 and the last three sessions were during Phase 2.

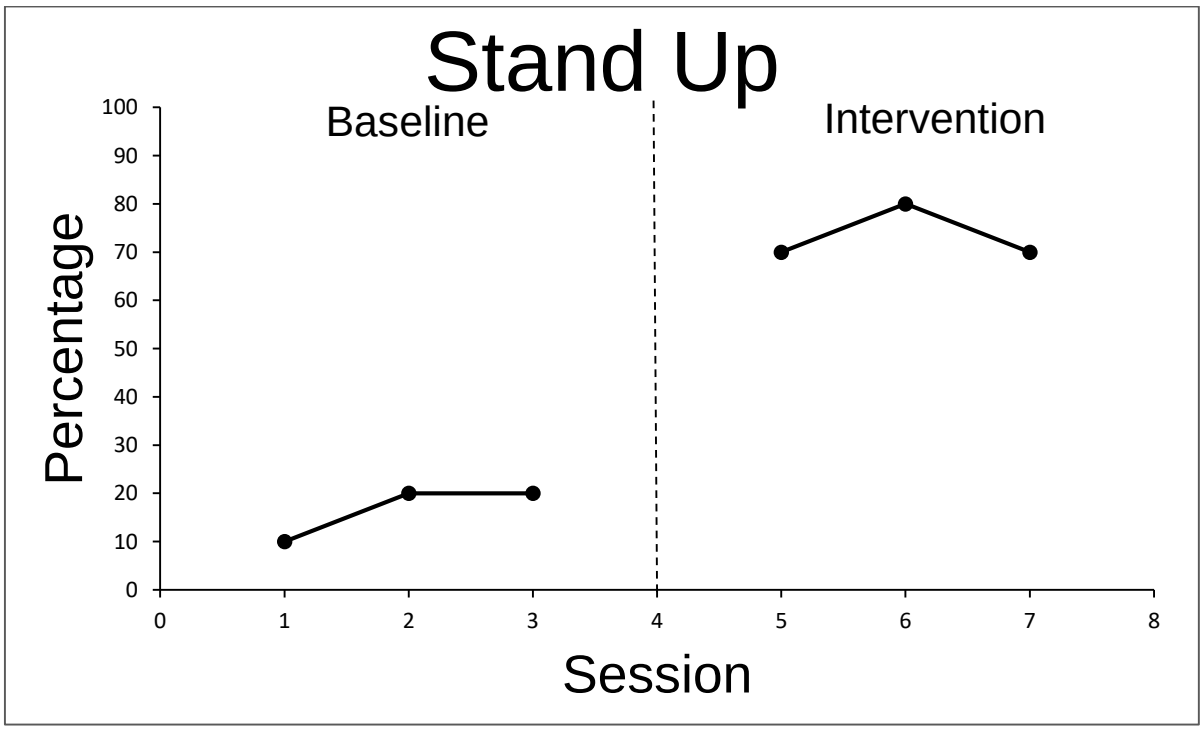

Figure 4. The percentage at the end of each session for Baseline during Phase 1, after shaping was conducted, and Phase 2.

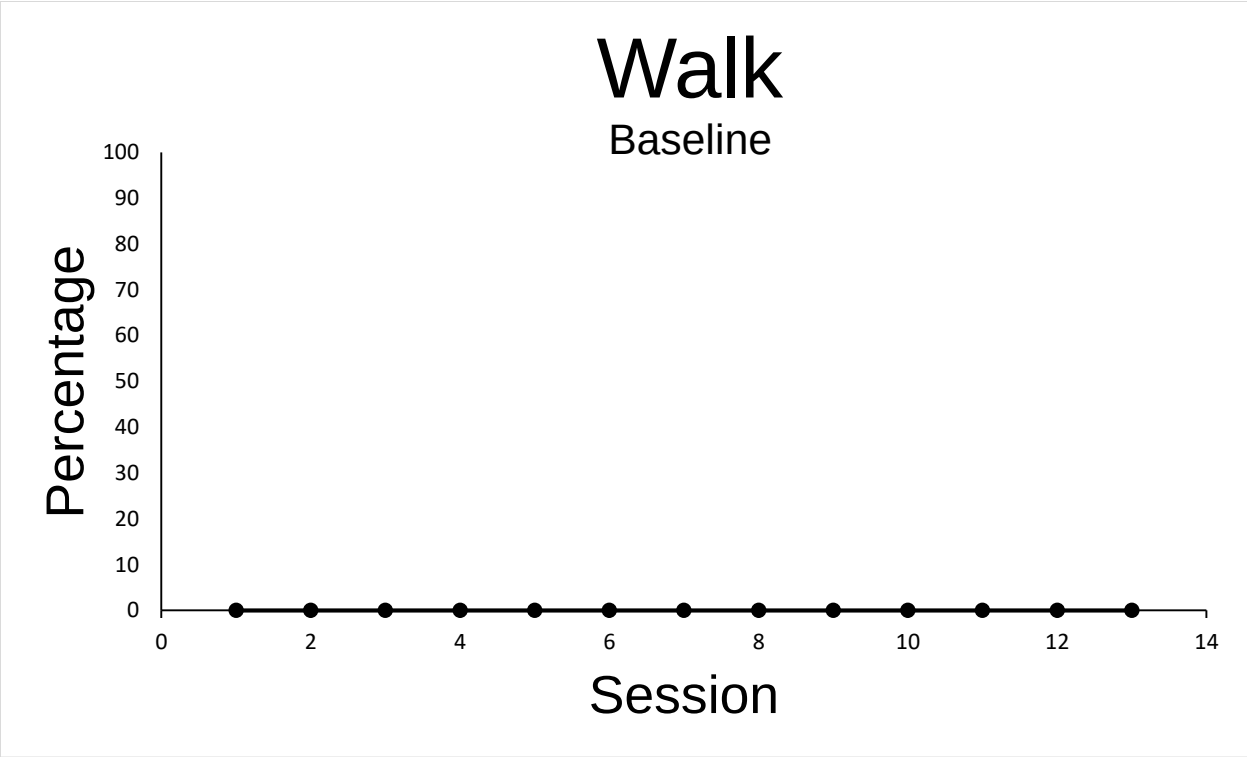

Figure 5. The percentage at the end of each session for Walk during baseline.

Discussion

The theory was correct because when using reinforcement, it is possible to increase correct responses to the icon ring. Things could have been done differently but there is nothing major that needed to be changed. Possible errors included that before the iPad© and coloring was introduced motivation was really low so that could have contributed to not getting correct responses, the location of the child's booth in the classroom caused for high distraction as motivation was lost once he saw that the buses were at the school to pick him up, or his discrimination skills were not as high as was originally thought and that was why when he was only attending to the icon that the correct response was not done, as he could not discriminate the response from the others. The reason that this would have affected the outcome was because if the child was not reacting to the proper S^D then it is not showing how our intervention would work with a child that could discriminate properly, if motivation was higher then H may not have

whistle-blown, or if the location of H's booth had controlled for less distractions then more correct responses could have occurred. The results from this intervention can help start a new program at our school for training instructional icons around the classroom which can help students advance to higher education faster; it could also be used at other schools to help more children learn to follow instructions better. Future research that can be done for this project is generalizing the instruction following skills to more than just the few icons discussed. Also, replications can be done for children older than the ages used in this project and should work the same if instruction following skills are at a lower level. The data sheets and icons used for this project were simple to use and can be easily changed for future studies.

References

Green, G. (2001). Behavior analytic instruction for learners with autism: Advances in stimulus control technology. *Focus on Autism and Other Developmental Disabilities 16*(2), pp. 72-85.

DOI: 10.1177/108835760101600203

Lequia, J., Wilkerson, K. L., Kim, S., & Lyons, G. L. (2015). Improving transition behaviors in students with autism spectrum disorders. *Journal of Positive Behavior Interventions 17*(3), pp. 146-158.

DOI: 10.1177/1098300714548799

Siegel, E. B. & Lien, S. E. (2015). Using photographs of contrasting contextual complexity to support classroom transitions for children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities 30*(2), pp. 100-114.

DOI: 10.1177/1088357614559211

Appendix A

*Icon Ring used for Phases 1 through 3.

Appendix B

Explicit Programming for the Icon Ring- **Baseline**

Date:

Participant:

Chelsea or Sam

No consequences (reinforcement or correction) provided for Sit Down, Stand Up or Walk!

Target	**Data**	**Correction**
Sit Down		No Correction
Walk		
Stand Up		
Sit Down		
Walk		
Stand Up		
Walk		
Sit Down		
Stand Up		
Sit Down		
Stand Up		
Walk		
Sit Down		
Walk		
Stand Up		
Stand Up		
Walk		
Sit Down		
Sit Down		
Stand Up		
Walk		
Sit Down		
Walk		
Stand Up		
Sit Down		
Stand Up		
Walk		
Sit Down		
Stand Up		
Walk		

Target	% Correct
Sit Down	
Stand Up	
Walk	

*This is an example of a data sheet used to take baseline data.

Appendix C

Explicit Programming for the Icon Ring- **Phase 1 (Sit Down)**

Date:

Participant:

Chelsea or Sam

No consequences (reinforcement or correction) provided for Stand Up or Walk!

Target	Data	Correction
Sit Down		G P F
Walk		
Stand Up		
Sit Down		G P F
Walk		
Stand Up		
Walk		
Sit Down		G P F
Stand Up		
Sit Down		G P F
Stand Up		
Walk		
Sit Down		G P F
Walk		
Stand Up		
Stand Up		
Walk		
Sit Down		G P F
Sit Down		G P F
Stand Up		
Walk		
Sit Down		G P F
Walk		
Stand Up		
Sit Down		G P F
Stand Up		
Walk		
Sit Down		G P F
Stand Up		
Walk		

Target	% Correct
Sit Down	
Stand Up	
Walk	

*This is an example of a data sheet used to take Phase 1 Data.

Appendix D

Explicit Programming for the Icon Ring- **Phase 2 (Stand Up)**

Date:

Participant:

Chelsea or Sam

No consequences (reinforcement or correction) provided for Walk!

Target	**Data**	**Correction**
Sit Down		G P F
Walk		
Stand Up		G P F
Sit Down		G P F
Walk		
Stand Up		G P F
Walk		
Sit Down		G P F
Stand Up		G P F
Sit Down		G P F
Stand Up		G P F
Walk		
Sit Down		G P F
Walk		
Stand Up		G P F
Stand Up		G P F
Walk		
Sit Down		G P F
Sit Down		G P F
Stand Up		G P F
Walk		
Sit Down		G P F
Walk		
Stand Up		G P F
Sit Down		G P F
Stand Up		G P F
Walk		
Sit Down		G P F
Stand Up		G P F
Walk		

Target	% Correct
Sit Down	
Stand Up	
Walk	

*This is an example of a data sheet used to take Phase 2 data.

Appendix E

Explicit Programming for the Icon Ring- **Phase 3 (Walk)**

Date:

Participant:

Chelsea or Sam

Target	**Data**	**Correction**
Sit Down		G P F
Walk		G P F
Stand Up		G P F
Sit Down		G P F
Walk		G P F
Stand Up		G P F
Walk		G P F
Sit Down		G P F
Stand Up		G P F
Sit Down		G P F
Stand Up		G P F
Walk		G P F
Sit Down		G P F
Walk		G P F
Stand Up		G P F
Stand Up		G P F
Walk		G P F
Sit Down		G P F
Sit Down		G P F
Stand Up		G P F
Walk		G P F
Sit Down		G P F
Walk		G P F
Stand Up		G P F
Sit Down		G P F
Stand Up		G P F
Walk		G P F
Sit Down		G P F
Stand Up		G P F
Walk		G P F

Target	% Correct
Sit Down	
Stand Up	
Walk	

*This is an example of a data sheet that would have been used to take Phase 3 data.

Appendix F

Treatment Integrity Form
Phase 1

Date: Student:

1. Remove everything except reinforcers from booth	Y N
2. Conduct PA	Y N
3. Records data at least every three trials	Y N
4. Totals % correct for all targets	Y N
5. Presents “Stand Up” & “Walk” icons but delivers no consequence	Y N
6. Conducts at least 1 ELO before presenting “Sit Down” icon	Y N
7. Presents “Sit Down” icon and delivers consequence immediately (error correction or reinforcement)	Y N
8. Follows error correction procedure correctly	Y N
Total Points	/8 = %

Treatment Integrity Form
Phase 1

Date: Student:

1. Remove everything except reinforcers from booth	Y N
2. Conduct PA	Y N
3. Records data at least every three trials	Y N
4. Totals % correct for all targets	Y N
5. Presents “Stand Up” & “Walk” icons but delivers no consequence	Y N
6. Conducts at least 1 ELO before presenting “Sit Down” icon	Y N
7. Presents “Sit Down” icon and delivers consequence immediately (error correction or reinforcement)	Y N
8. Follows error correction procedure correctly	Y N
Total Points	/8 = %

*This is an example of the Integrity Form used to make sure I was running my project correctly.