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AN EVALUATION OF FADING PROCEDURES ON THE EFFECTS
OF CHILDREN USING ACTIVITY SCHEDULES TO PLAY
ON THE PLAYGROUND APPROPRIATELY

by

Kylee Lewis

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Special Education

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2016

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ABSTRACT

An Evaluation of Fading Procedures on the Effects of Children Using Activity
Schedules to Play on the Playground Appropriately

by

Kylee Lewis, Master of Science

Utah State University, 2016

Major Professor: Thomas S. Higbee, Ph.D.
Department: Special Education

Previous researchers conducted activity schedule studies and used them on unstructured areas such as the playground. This study investigates the ability of fading procedures on the effects of using activity schedules on the playground. This study displayed that fading procedures can be used and determined based on the level of the individual. The results showed that two participants were able to fade to more portable forms of activity schedules from the typical activity schedule binder. This study provides many possibilities for conducting future research involving the use of fading procedures on activity schedules.

(41 pages)

PUBLIC ABSTRACT

An Evaluation of Fading Procedures on the Effects of Children Using Activity
Schedules to Play on the Playground Appropriately

Kylee Lewis

Children with autism often have difficulty playing appropriately and independently. Activity schedules have been shown to be effective at teaching children with autism to play. Some individuals with autism engage in repetitive behaviors, especially on the playground. A previous study showed that activity schedules were effective at reducing repetitive or patterned behavior on the playground by teaching three students with autism to play appropriately and independently. This study investigated the effects of fading procedures on teaching independent and varied play skills to young children with autism during free play on the playground.

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Kylee Lewis

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CHAPTER I

INTRODUCTION

Many children with Autism Spectrum Disorder display behavior excesses in areas such as insistence of sameness, repetitive behaviors and adherence to routines (American Psychiatric Association [APA], 2013). This can limit the ability for children with autism to play appropriately. A lack of play skills can be socially stigmatizing to a young child with autism, limiting their play interactions with peers.

Activity schedules consist of texts or pictures to break general activities (like free play or recess) into a sequence of specific activities (Krantz, MacDuff, & McClannahan, 1993). Activity schedules have been used as cues for children with autism to engage in appropriate play skills independent from adult prompts (Brodhead, Higbee, Pollard, Akers, & Gerencser, 2014).

Akers, Higbee, Pellegrino, and Pollard (2016) assessed whether activity schedules could serve as cues for children with autism to play in the specific unstructured setting of the playground. Activity schedules were presented in the form of activity schedule binders. Results indicated that using activity schedules successfully increased the independent appropriate play of three children with autism between the ages of 3-8 years when used during recess on the playground.

Despite the documented success of activity schedules, this form of visual support could become socially stigmatizing to a child with autism, especially in areas such as play. For example, peers might engage with children using activity schedule less, and it also might disrupt the natural flow of free play. Photographic activity schedules might

also limit the contact with natural reinforcers in the environment, thereby decreasing the ability of children with autism to become independent. Based on my review of the literature, there have been no studies on the effects of fading these visual supports. Therefore, research is needed to evaluate the extent to which activity schedules can be faded while maintaining independent and appropriate play skills on the playground.

CHAPTER II

LITERATURE REVIEW

I searched multiple sources for articles relating to activity schedules and play including: ERIC, Psych info, Google Scholar, textbooks on activity schedules, and articles recommended by committee members, and colleagues. I initially generated a search result of 16 articles when I used the search terms: *activity schedules*, and *play*. I was able to reduce that number down to four articles by searching more specifically for increasing play in less structured environments. I chose articles more relevant to my area of research.

Bryan and Gast (2000) conducted a study evaluating the effectiveness of activity schedules on on-schedule and on-task behaviors. Four students with autism ranging in ages 7 to 8 years old participated in the study. This study specifically assessed whether visual activity schedules and graduated guidance could be used to cue students with autism to engage in on-task and on-schedule behaviors. Researchers then assessed whether those behaviors would generalize to novel activities. On-schedule behavior was recorded after each completion of the task analysis, which involved returning the task activity card, finding and removing current task activity cards, and walking to the corresponding area. On-task behavior was recorded when the student was on-schedule and visually attending to his/her activity schedule. This study used an ABAB withdrawal design.

The researchers included a generalization condition to determine whether students could use activity schedules with novel activities. In this condition the researchers

presented the activity schedule with novel activity pictures and did not provide prompts. This condition was assessed before the “no book” (i.e., absence of activity schedule) condition, and after the “book only” condition of the study. In baseline (no book), the activity schedule was not present for the class literacy centers instruction. In the graduated guidance condition, students were taught to use their activity schedules during circle time. The researcher announced at the beginning of each session; “We will begin literacy centers now.” The researchers provided physical prompts for participants to begin each step in the picture activity schedule. The researchers then used graduated guidance to teach participants to complete each activity, clean up after each activity, and then move to the next activity in the sequence. Students were given 40 min to finish all work in the sequence. In the “book only” condition, procedures were similar to baseline, but the activity schedule was present and no prompts were provided (other than the announcement at the beginning of the session, “We will begin literacy centers now”). On-task and on-schedule behavior was praised during this condition on a variable interval (VI-13) schedule.

During the initial generalization probe, 20 % or less of the activity schedule steps were independently and accurately completed by all participants. During the “no book” (i.e., no book) condition, steps completed were equally low. When the graduated guidance condition began, completed steps increased after the 4th session to 90% or above for all participants. When procedures went back to the “no book” condition, responding again reduced to baseline levels. However, all participants independently completed 100% of steps in the “book only” and generalization conditions.

Results for this study show that activity schedules were effective at increasing on-

task and on-schedule behavior during academic work in the context of classroom literacy centers. A limitation of this study is that it was conducted during a more structured task; literacy centers. Research should consider examining activity schedules in less structured activities, such as free play activities.

To extend the literature to play activities, Morrison, Sainato, Benchaaban, and Endo (2002) developed a procedure for using activity schedules and correspondence training to increase the play skills of children with autism. The participants included four preschool children with autism as well as eight typically developing preschoolers. Researchers measured the percentage of intervals when the child was on task and total number of occurrences of correct correspondence of play selection to play behavior to assess the effects of activity schedules and task correspondence on independent play skills. On-task behavior was defined as the child visually looking at the activity schedule or presented play materials. The definition also included the child appropriately manipulating the toy presented, and appropriate interactions between the child and another person. Play correspondence was defined as the child making a selection from three pictures of each play area presented, putting the selected picture on the activity schedule, and following the behavior sequence selected. A multiple baseline across participants design was used to measure the effects of the independent variables.

During baseline, the therapist brought the child to the table and asked, "Where do you want to play?" If the child selected a picture of a play area, they were prompted by the therapist to attach it to the clipboard. The therapist then asked, "Where do you want to play next?" The same procedure was repeated until the third selection. If the participants had three selections on the clipboard they were then told to "Follow your schedule." If

the child did not play within 15 s the instruction to follow the schedule was repeated. Researchers provided general prompts (e.g., gestural prompts) to play when the child was off task or engaged in stereotypic behavior for more than 20 s. The training condition procedures were similar to baseline; however, the experimenter used graduated guidance (systematically faded physical prompts) to teach the child to follow the activity schedule depicted on the clipboard. In the Say + Reinforcement condition the procedures were again similar to baseline, except the child was given verbal praise and a stamp on his or her hand for correctly telling the experimenter what he or she was going to do. The experimenter gave the child verbal prompts, and were given to the child if they were not following the activity schedule. In the play correspondence package, the same general procedures were followed, but the researcher provided no prompts if the child did not go to the correct play area. If the child was not in the correct play area and was off task, the experimenter prompted the child back to the activity schedule and said, "Follow your play schedule." At the end of the sequence in this condition, the participants were brought back to the table and the experimenter gave the participants feedback on whether or not they correctly corresponded to the selected play area and play behavior.

The results from baseline indicated that on task behavior was low for all participants. In the training condition, on-task behavior increased for all participants, but prompts from experimenters were high. In the Say + Reinforcement condition, on-task behavior decreased to baseline levels; however, on-task behavior again increased in the play correspondence package phase.

For the second dependent variable, play correspondence, baseline results showed that only one participant exhibited any instance of the behavior. In the activity schedule

training condition, play correspondence increased for all participants, but, as with the training condition, experimenter prompts were high. In the Say + Reinforcement phase, play correspondence decreased back to baseline levels. Levels of correspondence increased for all participants in the play correspondence package condition to levels even higher than the activity schedule training condition.

Overall, the results indicated that activity schedules and task correspondence training were effective at increasing on task and play correspondence behavior. However, this study was conducted in an inclusive classroom setting. Future researchers need to determine if activity schedules can be effective in other settings, such as the playground.

Therefore, Machalicek et al. (2009) examined the effects of activity schedules and task correspondence training to increase play and decrease challenging behavior on the playground. Three children ages 6-12 with moderate to severe autism were included in this study. Researchers used a multiple baseline across participants design to measure the effects of activity schedules and task correspondence training on play, challenging behavior, and correct completion of the task presented.

The procedures included graduated guidance to prompt the participants to correctly match the picture with the activity and the consequence included a small edible paired with praise for completing the activity presented. All challenging behavior was ignored. In baseline, the activity schedule, in the form of a clipboard with four numbered squares with Velcro, was placed on a bench that the participants passed on their way to the playground. Four pictures were chosen at random and placed in the numbered squares, and the participants were physically guided to the activity schedule and told, "Show me what you will play today." No other prompts were provided in baseline. In the

correspondence training condition, procedures were similar to baseline: the participant had 5 s to engage in the completion of the step and if the child did not respond within 5 s, the experimenter used graduated guidance to complete the step presented. The child needed to take the picture selected and match it to the appropriate area on the playground to engage in play. The student was then expected to play in the planned play area for 2 min. Data were taken on challenging behavior, and play activities. At the end of 2 min, the teacher praised the child and delivered a small edible. The teacher used verbal prompts to direct the child back to the activity schedule, and the procedures were then repeated.

In baseline, two participants showed high levels of challenging behavior and all three participants showed low levels of play. When activity schedules and task correspondence training were introduced, play increased for each participant and for two participants challenging behavior decreased while levels remained low for the third participant. However, one participant required more intervention to acquire the correspondence training steps. Following intervention all participants demonstrated correct activity schedule following with limited prompts. Additionally, challenging behavior decreased or remained at low levels for all participants.

Although the results show that activity schedules were effective in increasing appropriate play and decreasing challenging behavior, there are two limitations to this study. First, 2 min seemed to be a difficult amount of time for a young child with autism to stay engaged in a particular play area without being taught a designated pattern, especially if the activity is something like playing on a slide. Second, the adult or therapist was present for the entire 2 min of play. The need for constant adult supervision

seems contrary to the purpose of activity schedules (i.e., facilitate independence).

To continue this research, Akers et al. (2016) examined activity schedules in the context of gradually fading adult prompts to teach children with autism to independently move from one activity to another on the playground. Akers et al. 2016 did not require the child to stay in the particular area for more than 2 min, and the student was taught to complete multiple activities, some of which were natural to complete in a limited amount of time and some that required an extended amount of time.

Akers et al. (2016) used a multiple baseline across participants design to evaluate the effectiveness of activity schedules on appropriate and independent playground skills in three preschool children with autism. The researchers used momentary time sampling to measure the number of different playground activities completed and engagement. The researchers scored the participant as being engaged when the participant was playing on, or with, the equipment appropriately, or moving toward the completion of the targeted activity. Before the study began, students were taught picture correspondence so that they were able to match the picture with the location of the activity. Activity schedules were set up in the form of a binder that was placed on a chair in the play area.

During baseline, participants were brought to the play area and told to “Go play.” No additional prompts were given, unless the child tried to leave the designated play area. A schedule probe was then conducted, which involved the same procedures described in baseline, except that the activity schedule was present. In the teaching condition researchers used most-to-least prompting (errorless teaching) to teach the child to use the schedule and complete each activity. The prompts were faded as quickly as possible to ensure independent use of the activity schedule (e.g., most-to-least prompting). A no

schedule probe was conducted using the same procedures as in baseline. In the novel activities condition, procedures were the same as teaching, except that new activities were put into the schedule. A follow up condition assessed the maintenance of skills two weeks after the completion of the study.

During baseline and the schedule probe condition, the participants engaged in a range of 0 to four activities. Once the teaching condition began the total number of activities completed quickly increased, and the number of independent completed activities increased as well. During the no schedule probe responding decreased to near baseline levels, but increased again when the novel activities and maintenance conditions were implemented.

The researchers demonstrated that the activity schedules were effective at teaching three children with autism to play independently and appropriately on the playground. When the binder was removed, responding went back to baseline levels, indicating that the presence of the activity schedule was essential. The authors suggested that future research could assess fading procedures to remove the activity schedule binders while maintaining appropriate play behavior.

Although numerous studies have shown that activity schedules can be effective at increasing independent behavior by reducing the prompts given by caregivers (Krantz et al. 1993), the results of my literature review failed to find any studies that have investigated the effects of systematically fading the activity schedule itself. Therefore, the purpose of this study was to evaluate the effects of fading the activity schedule binders on participants' independent play behavior on the playground. Another primary purpose was to extend the previous study conducted by Akers et al. (2016) by fading. The fading

process involved attaching photographic cues to a lanyard and systematically fading the photographic schedule until no cues remained. Specifically, the research question to be investigated was the following: To what extent can a photographic activity schedule be faded, while independent play remains consistent, as measured by percent of activities completed, for three preschool-age children with autism who have learned to play on the playground using a photographic activity schedule?

CHAPTER III

METHODS

Participants

Three children, ages 3-5 years old, diagnosed with autism spectrum disorders (ASD) were recruited to participate. All of the participants (Aaron, Warren, and Evan) attended the same preschool. Two participants (Warren and Evan) had some prior history with the activity schedules before beginning. Warren was able to use his activity schedule at about 80% or higher proficiency. Evan had to do his activity schedule away from others and with minimal distractions. One participant (Aaron) had no prior history with activity schedules that we were aware of before beginning the study.

Setting and Materials

The study took place on an outdoor grass area on the Utah State University (USU) campus. Activities were set out in a circle-like manner in the same position each day. The activity schedule consisted of a three-ring binder with photographic cues attached to each page with Velcro (Figure 1). During baseline, all participants had six pages for their activity schedule with five pictures of activities, and one page consisting of either an edible reinforcer or a tangible reinforcer. For two participants (Aaron and Warren), there were seven pages consisting of six activities and the last page with an edible reinforcer. They both had a pool of eight activities that were randomly selected by using a random list generator each day. For the other participant (Evan), he had five pages (four pages with pictures of activities and the last page with a tangible reinforcer) and a phone picture



Figure 1. Picture of the activity schedule binder.

to signal music being played. Evan had a pool of six activities that were randomly selected by using a random list generator each day. Preference assessments were performed to select the designated reinforcer for each participant. Four activities were added to the number of activities that each participant completed in baseline. We based this decision on replicating and extending the Akers et al. (2016) study, which is also why we ultimately chose 10-minute sessions in baseline. When the fading procedures were in place, a vertical clear plastic strip was used with two long pieces of Velcro one on the right side and one on the left side (Figure 2). A lanyard was then used to allow the clear plastic strip to be attached to it (Figure 2). Two pieces of Velcro were also attached vertically to a page similar to the ones placed inside the activity schedule binder for the fading condition as well (Figure 3). The schedules used in this study were different than the ones used in the other studies as discussed above except for the activity schedule binder, which was the same schedule, used in the Akers et al. (2016) study. A flip/video camera was used to record all sessions.



Figure 2. Picture of the clear plastic strip with lanyard.



Figure 3. Picture of one page with two pieces of Velcro.

Dependent Variables and Measurement

The primary dependent variable was the number of different playground activities completed. The activities needed to be different than the previous activities completed to count as an activity. For some activities only one response was required (e.g., slide, tunnel, airplane). For other activities two responses were required (e.g., basketball hoop, t-ball, Frisbees, soccer, ball toss, bowling). Frequency data was taken to count the number of completed activities.

The secondary dependent variable was engagement. Engagement was defined individually for each participant (e.g., looking at, or touching the pictures as well as working towards the completion of an activity, letting the experimenter prompt the participant), and a 10 s momentary time sampling measure was used. Engagement was defined as playing on or with the equipment appropriately. Participants were required to be continuously moving on the equipment and on the ground to be scored as engaged. Two participants (Aaron and Warren) were given four intervals of 20 s to walk towards an activity and to complete that activity (e.g., walk towards the slide go down the slide). One participant (Evan), was given five intervals of 10 s. Participants were marked off-task if they were engaging in stereotypy (e.g., playing with the plastic strip) or playing on or with the equipment in a way other than it was intended (e.g., laying on the slide, throwing soccer balls at others, etc.).

A third dependent variable was the percentage of independently completed steps when activity schedule materials were present. The number of independently completed steps was recorded and divided by the total number of steps completed. Steps included

(a) point to the picture, (b) go to the activity, (c) complete the activity, (d) return to the schedule, (e) turn the page and (f) repeat the previous steps.

Design

This study used a multiple baseline across participants design to evaluate the effects of the photographic activity schedule to increase playground activity completion and the effects of the fading procedures in children with ASD.

Pretraining and Assessment

Before beginning sessions, we pretaught picture-location correspondence to ensure all the participants could proceed to correct locations after being shown a picture of the activity. We showed the picture to the participant and gave the direction “go here.” The mastery criterion for each activity was 100% independent correct responding for the initial teaching session or 100% independent correct responses for three sessions if instruction was required. The participants were also taught that each activity was close ended (e.g., the soccer net, the participants were taught to kick both soccer balls in the net and then they were done, the airplane, they were to ride from one cone to the other.) Activities were chosen based on if the participant could master them. If not, then a different activity was chosen for that given participant.

Baseline

In baseline, the therapist brought the participant to the outdoor area and the experimenter gave the instruction “Go play.” The activity schedule was present during

this condition. No prompts or programmed reinforcers were provided, and the session lasted for 10 min.

Activity Schedule

In the Activity Schedule phase, the participants were brought to the play area and given the instruction, “Go Play.” If the child did not engage in an appropriate activity or component of the activity schedule (specified below) within 5 s, the experimenter used most-to-least prompting (Wolery & Gast 1984) to promote this engagement. This procedure was designed to ensure errorless teaching and to gain responding to levels above 90% independence. The components of activity schedule following included (a) point to the picture, (b) go to the activity, (c) complete the activity, (d) return to the schedule, (e) turn the page and (f) repeat the previous steps. The activity schedule phase continued until the participant completed 90% or more of the activity schedule components independently (without adult prompts) for three consecutive sessions.




Fading

During fading, the participants were brought to the play area and given the instruction, “Go Play.” The participants were taught using most-to-least prompting (Wolery & Gast 1984). The fading steps that were implemented for each session are displayed in Table 1. The graphs in each figure also display the number for each session that corresponds to the fading steps described below.




If participants responded at levels of 90% or higher, then they were allowed to move on to the next step in the fading procedures. If the participant dropped below 90%

Table 1




Fading Steps Outlined

Fading steps numbered	Fading step defined
1	Pictures were placed on the activity schedule pages of the size 3.2 x 3.2 inches. The activity schedule binder was used.
	
2	Pictures were placed on the activity schedule pages of the size 2.56 x 2.56 inches. The activity schedule binder was used.
	
3	Pictures were placed on the activity schedule pages of the size 2.04 x 2.04 inches. The activity schedule binder was used.
	




(table continues)

Fading steps numbered	Fading step defined
4	Pages from the activity schedule were removed entirely, and the pictures were then attached in a vertical position along a plastic strip, that was placed in the activity schedule binder in the size of 2.04x 2.04 inches.
	
4 (b)	Only one page was left in the activity schedule binder. Two long strips of Velcro were placed on the page. Pictures were attached in a vertical position along one strip of Velcro on the page in the size of 2.04 x 2.04 inches.
	
5	The plastic strip with pictures of the size 2.04 x 2.04 inches were attached to the lanyard, and was guided around the child's neck to create portability. The activity schedule binder was not used.
	





(table continues)

Fading steps numbered	Fading step defined
5 (b)	The plastic strip with pictures of the size 2.04 x 2.04 inches was attached to the lanyard, and was left on the chair during the session. The activity Schedule binder was not used. 
5 (c)	One page was left in the activity schedule binder. The pictures were faded to the size 1.6 x 1.6 inches. 
6	The plastic strip attached to the lanyard was used. The pictures were faded to the size 1.6 x 1.6 inches. 

(table continues)

Fading steps numbered	Fading step defined
6 (b)	The binder will be taken away and one page will be left with pictures attached in the size of 1.6 x 1.6 inches. 
7	The plastic strip attached to the lanyard was used. The pictures were faded to the size 1.3 x 1.3 inches. 
7 (b)	One page was used, and left on the chair. The pictures were faded to the size of 1.3 x 1.3 inches 

(table continues)

Fading steps numbered	Fading step defined
8	The plastic strip attached to the lanyard was used. The pictures were faded to the size 1 x 1 inch
	
8 (b)	One page was used, and left on the chair. The pictures were faded to the size of 1 x 1 inches
	
9	The pictures were removed, but the lanyard was left to signal varying play behavior.
	
9 (b)	The pictures were removed, but the one page remained to signal varying play behavior.
	
10	All materials were removed entirely

for one session, then the participant remained on that given step. If the participant dropped below 90% for two sessions, then the participant returned to the previous step in the sequence until they regained responding to 90% or above. Each step of the fading procedures is defined and pictures shown in Table 1.

Interobserver Agreement

For the purpose of producing a permanent product to facilitate recording of interobserver agreement (IOA), researchers videotaped all sessions. IOA was assessed for 33% of all sessions and was evenly dispersed across conditions. IOA was calculated by taking the number of agreements of activities completed divided by the number of agreements plus disagreements for the number of completed activities. Mean agreement was 100% for Aaron, 100% for Warren, and 100% for Evan. IOA was calculated by taking the agreements of the number of independent steps completed by participants divided by the number of agreements plus disagreements and multiply by 100. Mean agreement was 99% (range 97% to 100%) for Aaron, 99% (range 97% to 100%) for Warren, and 99% (rang 97% to 100%) for Evan. Dividing the number of agreements of intervals by agreements plus disagreements and multiplying by 100 was IOA for engagement. Mean agreement was 99% (range 98% to 100%) for Aaron, 99% (range 95% to 100%) for Warren, and 95% (range 86% to 100%) for Evan.

Treatment Integrity

Treatment integrity was assessed at least 33% of sessions, evenly dispersed across conditions, by scoring whether the experimenter (a) gave the correct instruction (i.e., “Go

Play”), (b) sequenced the activity schedule in the correct order, (c) only provided manual prompts (i.e., no verbal prompts), (d) had the correct play materials available, (e) recorded the sessions, and (f) faded the appropriate materials for the designated session. Treatment integrity was calculated by dividing the number of completed components by total number of components, and multiplied by 100. Mean integrity was 97% (range 83% to 100%) for Aaron, 100% for Warren, and 100% for Evan.

CHAPTER IV

RESULTS

The results for Aaron show that during baseline the participant engaged in 0 to two activities (upper panel, Figure 4). During the activity schedule condition, Aaron began engaging in six activities (Upper panel, Figure 4). In the Fading condition, Aaron was still able to maintain the six activities when the activity schedule was present (Upper panel, Figure 1.). When the activity schedule was removed and the one page was left as a signal to vary, Aaron was able to complete seven activities (upper panel, Figure 4.). When everything was removed, Aaron's responding went back to baseline levels and he completed only one activity (upper panel, Figure 4.).

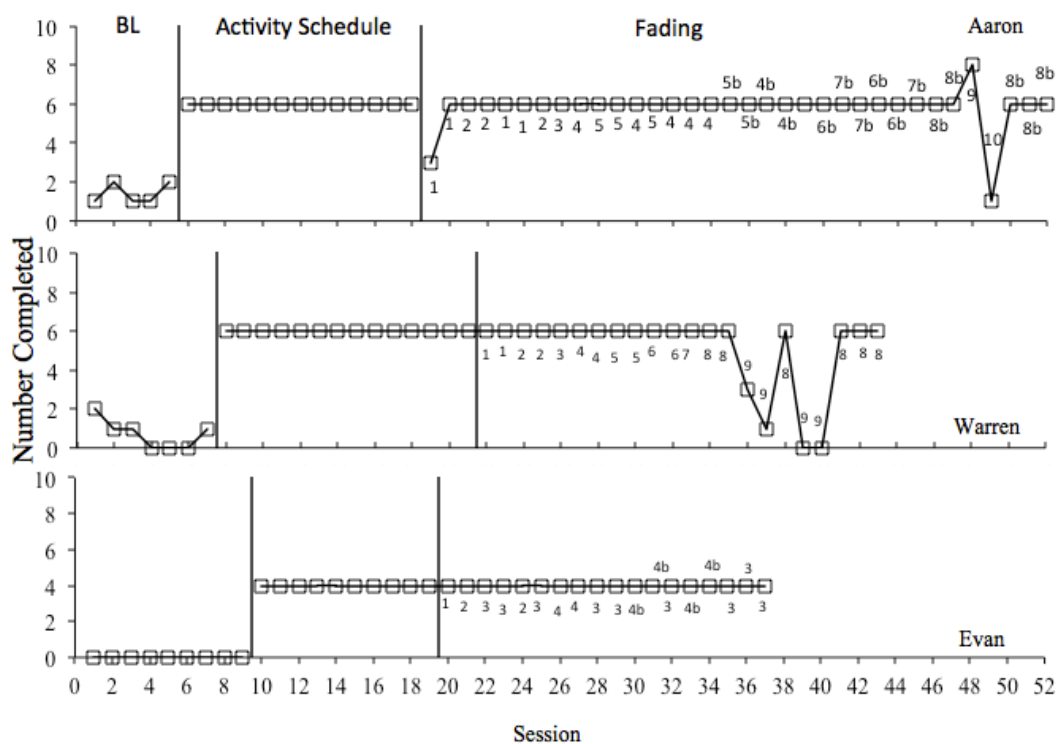


Figure 4. Data on the number of activities completed.

In baseline, although the activity schedule was present, Aaron did not engage in any of the activity schedule components so the percentage of independently completed steps was 0 (upper panel, Figure 5.). For the activity schedule components responding was on an increasing trend, and levels stayed high until he was able to meet the criterion of three sessions at 90% (upper panel, Figure 5.). For the fading condition, Aarons responding was a little more variable but initially levels of responding were still higher than in baseline (upper panel, Figure 5.). Some of Aaron's steps needed to be modified for him to meet the 90% criterion to continue through the process of the fading procedures. Instead of using the clear plastic strip, Aaron's sessions included using the one page with pictures attached. The break in the percentage of independent steps graph for Aaron is where there was no activity schedule present.

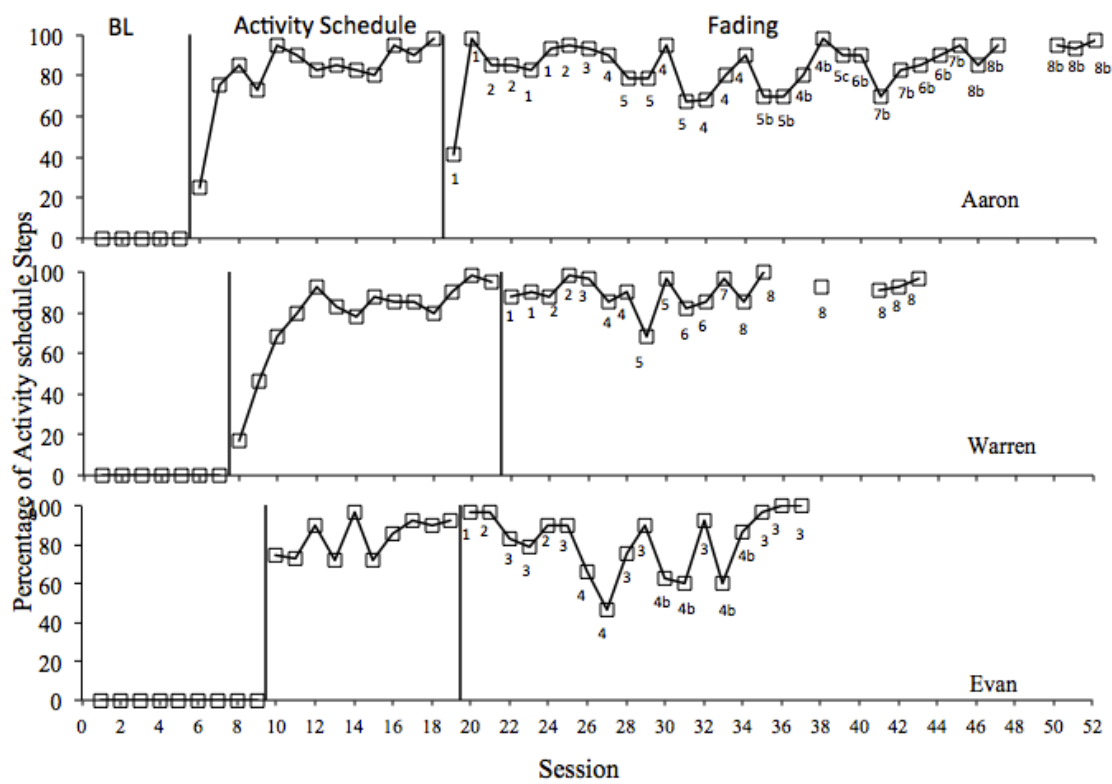


Figure 5. Data on the percent of independent steps completed.

During baseline, Aaron's engagement levels were low ranging from 13% to 45% (upper panel, Figure 6.). Levels of engagement increased and stayed high and were stable when the activity schedule condition was in place (upper panel, Figure 6.). For the fading condition, Aaron's levels of responding were variable but still higher than in baseline (Upper panel, Figure 6.). When the pictures were removed (step 9 [b]), and when the schedule was removed (step 10) the percent of engagement immediately decreased and went back to baseline levels.

The results for Warren during baseline show that the participant engaged in 0 to two activities (middle panel, Figure 4.). In the activity schedule condition, the number of completed activities increased and Warren began engaging in six activities (middle panel, Figure 4.). During the fading condition, Warren was able to maintain engaging in six

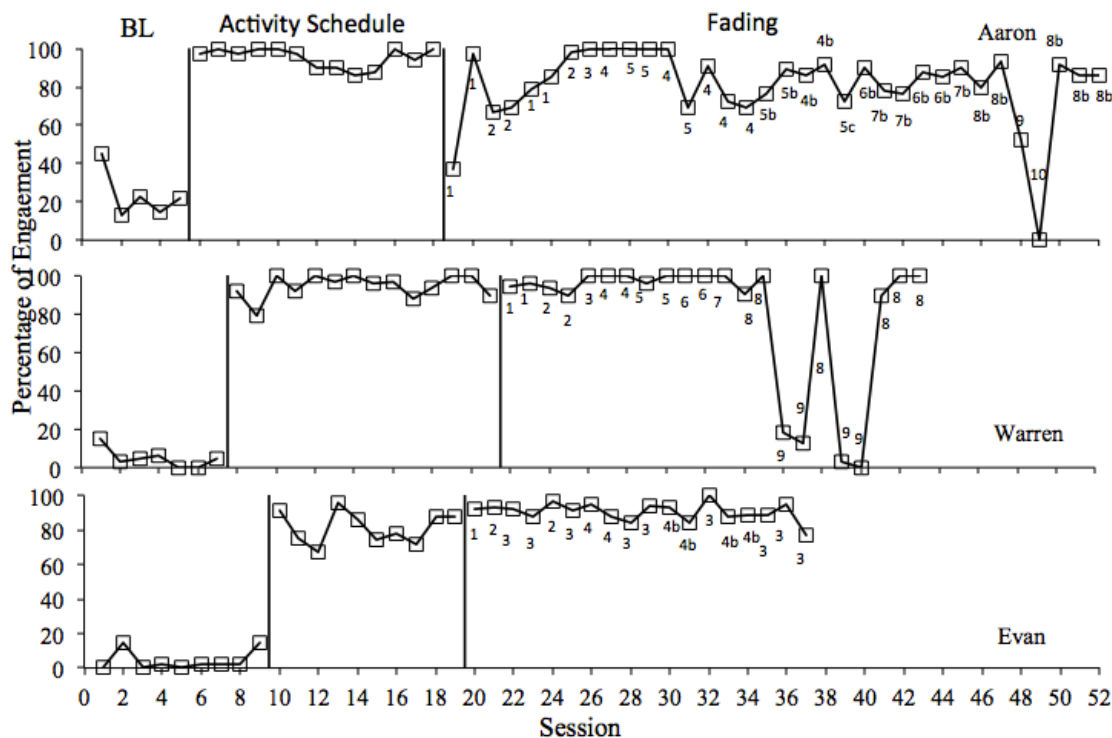


Figure 6. Data on the percentage of engagement.

activities when the schedule was present (middle panel, Figure 4.). When the pictures were removed and the lanyard was left to signal responding (step 9) and when the materials were removed entirely (step 10) responding immediately decreased to baseline levels (middle panel, Figure 4.).

In baseline, although the schedule was present, the percentage of independently completed steps remained at 0 (middle panel, Figure 5.). For the activity schedule components, responding immediately increased and levels remained high until Warren was able to maintain the three sessions at 90% criterion (middle panel, Figure 5.). For the fading condition, responding remained high with some variability (middle panel, Figure 5.).

During baseline, the percent of engagement remained low and ranged from 0% to 20% (middle panel, Figure 6.). For the activity schedule components, the percent of engagement increased and responding remained high (middle panel, Figure 6.). During the fading condition, Warren's percent of engagement levels were stable and high until the schedule was removed, and then engagement went back down to baseline levels (middle panel, Figure 6.). Responding immediately increased when the schedule was put back into place (middle panel, Figure 6.).

The results for Evan show that during baseline the participant did not engage in any activities so responding remained at 0 (lower panel, Figure 4.). During the activity schedule condition, responding increased, and the participant immediately began responding in four activities (lower panel, Figure 4.). In Fading, Evan was able to maintain engaging in four activities throughout sessions (lower panel, Figure 4.).

The percentage of independent completed steps also remained at 0 since Evan did

not engage in any of the components of the activity schedule (lower panel, Figure 5.). For the activity schedule components responding increased, and remained at high levels until Evan was able to maintain the three sessions at 90% criterion (lower panel, Figure 5.). For the fading condition responding was variable depending on the steps that Evan proceeded to. Since responding dropped off and Evan was not able to maintain the 90% criterion to proceed through the entire fading sequence he ended on step 3 (Table 1.) and was able to reach the three sessions at 90% for that step (lower panel, Figure 5.).

During baseline, the percent of engagement also remained low for Evan ranging for 0% to 15% (lower panel, Figure 6.). For the activity schedule components, engagement increased for Evan, and was variable but overall levels were higher than in baseline (lower panel, Figure 6.). The percent of engagement remained high during fading, and levels were even slightly higher than in the activity schedule components (lower panel, Figure 6.).

CHAPTER V

DISCUSSION

The number of activities that participants engaged in during baseline and the schedule probe ranged from 0 to 2 (Figure 4). Participants immediately began engaging in more activities once the teaching sessions were initiated (Figure 4.). The percentage of independently completed steps also immediately increased (Figure 5.). All three participants were able to go through the fading procedures, however each participant ended at different steps and/or personally modified steps (Figure 6.).

Given the results of this study, we were able to successfully replicate the results of the study conducted by Akers et al. (2016). The findings show that activity schedules were able to be faded back to more portable forms of visual supports for two participants, Aaron, and Warren (i.e., the bookmark with pictures and lanyard, and the one page with pictures). For Evan, the pictures were able to be faded to the smallest size in the activity schedule binder.

Using pictures attached to a lanyard may be found to be a valuable tool for teachers who might have more than one student on the playground. It is not only easier to carry, but it may also serve as the cue to vary responding on the playground, rather than requiring the teacher to physically prompt the student with autism. Using pictures attached to one page might also be beneficial because it may be easier to keep track of than an entire binder. However, even using an activity schedule binder is still valuable because the student spends more time engaged in the activities on the playground maximizing the benefit of spending more time with typical peers. To further show this, in

baseline, sessions lasted 10 min. and the participants were only able to complete one to two activities appropriately. For two of the participants (Aaron and Warren), sessions during the activity schedule condition and fading session when a schedule was in place lasted around five to six minutes. The two participants were able to complete six activities in that amount of time. For the other participant (Evan), sessions during the activity schedule condition, and fading conditions lasted around 7 to 8 mins, and he was able to complete four activities. Therefore, having a schedule in place increased responding in completing more activities and spending more time engaged in the activities presented.

One limitation to this study is that only three participants were included. Future research could examine the effects of fading activity schedules with larger samples of preschool children with autism spectrum, other populations (i.e., ages and disabilities), and in other settings. Fading activity schedules could be shown more successful in a structured environment, with more structured activities.

A second limitation to this study is that some of the steps had to be modified for participants because of essentially fading and teaching a new behavior. Future research could examine the effects of fading the activity schedule binders only (i.e., instead of fading to other forms such as one page, and plastic strip with the lanyard.)

A third limitation to this study is the amount of time learning and fading to a new step. Future research could examine putting the protocols clinically into programming and following up after more exposure to the fading procedures. More time spent on using the activity schedule outside during play activities, and more time spent on fading steps may help facilitating a transfer a stimulus control to the environment of outside and play

activities.

Even though the activity schedules were not able to be completely faded, future researchers might increase the number of training steps and find other ways to facilitate transfer of stimulus control. Additionally, researchers could examine adding a social component during play to initiate peer interaction. Researchers could also examine other forms of teaching children with autism to play on the playground appropriately (i.e., varied play), such as using signal training. This might be a less intrusive form of cueing the participant to vary responding, while maintaining independent and appropriate play on the playground in the presence of a particular stimulus.

This study extends the literature on fading procedures and activity schedules by demonstrating that schedules of different forms can be used to maintain independent and appropriate play on the playground. Two of the three participants were able to fade to other visual aids besides the typical activity schedule binder. The results demonstrate that each individual should be taken into consideration and that the schedule should be at the level of the individual as you can see supported by the data above. A primary limitation of this study was that in fading some of the steps included teaching a new behavior. Future research could look at increasing steps, and facilitating a better way to facilitate a transfer of stimulus control.

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