The Use of a Visual Aid to Facilitate Transitional Periods for Children with Autism Spectrum Disorder

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THE USE OF A VISUAL AID TO FACILITATE TRANSITIONAL PERIODS
FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

A Thesis Presented to
The Graduate Faculty of
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In Partial Fulfillment
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Master of Science
Applied Behavior Analysis

By
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December 2016
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ABSTRACT

THE USE OF A VISUAL AID TO FACILITATE TRANSITIONAL PERIODS FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

By

Stevi Barrio

December 2016

Transitioning is described as moving from one activity or place to another and has been often recognized as an event that can provoke problem behaviors in children diagnosed with autism spectrum disorder (Sainato et al., 1987). Past research has concentrated on facilitating transitions by using both functional behavior assessments and visual aids. A type of functional behavior assessment is the Questions About Behavioral Function, which is a measurement system designed to determine the function of a given behavior and the environmental stimuli that surround that behavior. This questionnaire rates how often the individual engages in the behavior for situations where it usually occurs in order to identify the reasons why that behavior is occurring by identifying the functional purpose. Additionally, visual aids that have been used in past research included tools that resembled a picture schedule that were presented to various participants at the end of one activity and before beginning another activity in order to facilitate that transitional period. The purpose of this study was to train a child to utilize a picture schedule by using a least-to-most prompting strategy to help facilitate transitions and reduce those problem behaviors associated with transitions. The findings from the current study were expected to show two different outcomes. First, the problem behavior would occur at a high frequency or for longer durations prior to implementing the
condition with the visual aid. Secondly, the proposed method of presenting a picture schedule to each participant before transitioning between activities would reduce the frequency or duration of problem behaviors that occur during that time. The results demonstrated that the implementation of the picture schedule reduced the occurrences of both of the problem behaviors for the participant. In addition, using the least-to-most prompting strategy helped him learn how to use the picture schedule independently so he could transition to activities with little prompting.
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CHAPTER I

INTRODUCTION

Autism Spectrum Disorder (ASD) is a developmental disorder that is identified on the basis of early-emerging social, communicational, and behavioral impairments (Frith & Happe, 2005). These impairments vary significantly amongst persons diagnosed with ASD and include complications in areas of socialization, verbal or nonverbal communication, self-help skills, academic skills, and various other behaviors. According to the CDC’s Autism and Developmental Disabilities Monitoring (ADDM) Network, 1 in 68 children are diagnosed with ASD and this rate of diagnoses are continuing to increase. Given the prevalence of ASD, it is important to provide effective systems that encourage early identification of the disorder to provide early intervention services. This would benefit children with ASD and their families so they get the support they need. There are many intervention strategies for individuals with ASD. For example, speech/language therapy and occupational therapies are common practices used to treat ASD to promote better communication skills and motor skills needed to perform daily activities. Another growing treatment for individuals with ASD is Applied Behavior Analysis (ABA) therapy, which focuses on promoting communication, socialization, self-help skills, academic skills, and various other individualized goals while at the same time reducing problematic behaviors that can occur within these individuals.

Applied Behavior Analysis and Autism

Applied Behavior Analysis is an evidence-based practice that is centered on the foundations that explain how learning develops by understanding the environmental factors that surround behavior. There are various studies that have been published
focused on the capability of long-term applied behavior analytic interventions for children diagnosed with autism to determine if these services make a difference for these individuals. For instance, a study by Virues-Ortega (2010) examined the combined effectiveness of different ABA interventions for individuals with autism by analyzing various studies and their characteristics including the measurement procedures (e.g., duration, magnitude, and frequency), the study design, the intervention model, and how each intervention was implemented. Afterwards, the analyses from each of these studies were used to estimate an overall effectiveness of the different ABA interventions. This research analysis involved 22 articles that recounted the long-term effects of different ABA interventions. The results of this analysis confirmed that long-term ABA services showed positive effects in regards to academic functioning, communication skills, daily living skills, social skills in children diagnosed with autism. Therefore, providing long-term ABA services to individuals diagnosed with autism could provide society with a positive perspective about the long-term benefits of ABA and could establish a large increase for the acquisition functional skills and a reduction in problem behaviors for these individuals.

There are various problem behaviors that an individual with ASD may engage in. These behaviors may include aggression, non-compliance, behavior that is self-injurious, or verbal protests (yelling or screaming). Many of these behaviors are triggered by past learning experiences, overstimulation, or simple changes in the environment. For example, one such environmental trigger for individuals with ASD is transitioning. This is defined as moving or changing from one activity or environment to another, which can
provoke problem behaviors for children diagnosed with autism (Lefebvre, Rapp, Sainato, & Strain, 1987).

**Transitioning Skills and Autism**

Transitioning is very a very important skill for any individual to acquire because a day may involve multiple different environmental, activity, or situational changes. Past research has projected that these changes or transitions account for 20% to 35% of an individual’s day and as a result it is key for people to learn appropriate transitional behavior (Lyon & Sainato, 1983). Various intervention strategies have been researched to aid these transitional periods and support the learning acquisition of transitioning skills for individuals diagnosed with autism or other developmental disabilities. Many of these studies focus their interventions on pre-school aged children diagnosed with autism and other developmental disabilities that might have problems transitioning between multiple activities in the classroom setting. Creating interventions to facilitate these periods can teach the child the necessary transitional skills to be successful in their educational environment. Some of these interventions include conducting functional assessments of such behaviors before creating a treatment plan in order to determine the environmental events that maintain these problem behaviors for the individual.

**Functional Analyses of Transitioning Behavior Problems**

Functional behavior assessments (FBA) involve questionnaires, interviews, and observations that surround a given behavior and are used to determine the reasons why that behavior is occurring. FBA’s include both indirect methods and direct methods in order to define specific antecedents and consequents of a behavior to understand its function (e.g., attention, non-social, escape, physical, or tangible). Indirect methods
include interviews, questionnaires, or surveys that are conducted between a therapist and a parent, teacher, caregiver, or anyone with direct experience with the behavior being measured. Direct methods involve the therapist directly observing the behavior to record what precedes the behavior (antecedents) and what immediately comes after the behavior (consequences). These methods are used in conjunction with one another to understand the overall reasons why a behavior is occurring in order to create the most appropriate intervention.

Multiple interventions have been studied to facilitate transitional periods and promote acquisition of these skills, many of which involve the use of an FBA. Atwell, Pritchard, Chen, Weinstein, and Wilder (2006) used a functional behavior analysis to observe transitions between activities for two children in pre-school that engaged in tantrums during transitional periods (from the end of one activity to the start of another activity). For the first participant, the results of the functional behavior analysis found that the tantrums were occurring because it allowed the participant to have access to the activity before the transition occurred. The results of the functional analysis determined that the second participant’s was engaging in tantrums to avoid the change of activities. The authors of the study used two intervention techniques, based on the results of the FBA’s, to potentially reduce the problem behaviors. The techniques involved giving an instruction of the upcoming transitions or utilizing a strategy where they differentially reinforced other appropriate behaviors while ignoring the tantrums (DRO plus extinction). The results suggested that providing an instruction before the transition was ineffective at decreasing tantrums with both participants. However, the DRO plus extinction was able to decrease tantrums for both participants. For that reason, this
research study recommends that functional behavior analyses can be utilized to possibly identify the reasons for problem behaviors during transitional periods with preschool-aged children. These can be used to create and implement appropriate interventions for those individuals’ behaviors throughout different transitions.

Additionally, a functional analysis was used by Iwata, McChord, and Thomson (2001) to identify the factors that were reinforcing and sustaining problem behaviors during transitions. These researchers examined a continuous chain of interventions from least to most intrusive that were created on the results of functional behavior analyses. Involved in this study were two individuals diagnosed with developmental disabilities. They demonstrated to engage in self-injurious behavior throughout transitional periods. The research sessions were lead in various settings in each of their homes to include the different activities and environmental stimuli that were paired with the transitions that the participants had in each of their daily routines. Assessments were completed to determine preferred (phase 1) and non-preferred (phase 2) activities. Phase 3 included completing a functional behavior analysis in which the participants were presented with environmental changes in different combinations of activities. During this time, the researchers observed whether these changes had effects on the participants’ self-injurious behaviors. Phase 4 involved evaluating different treatments by implementing various interventions during transitions and measuring the effects of the interventions on the participants’ self-injurious behavior during those periods. The results of the preference (phase 1) and avoidance assessments (phase 2) were completed to identify environmental stimuli that were exposed to the participants during various transitional periods.
The functional behavior analysis demonstrated the specific reasons that were sustaining each of the participants’ self-injurious behavior. The first participant’s SIB was occurring because they were trying to escape from the change of one activity to another. In addition, the second participant’s SIB was also occurring because of escape contingencies, but only of certain non-preferred activities. These results were used to develop interventions during transitions that were appropriate for a given transitional situation and the specific function of the behavior. The interventions they developed for phase 4 involved reinforcing alternative behaviors (DRA), providing an advance instruction of the upcoming change, and DRA plus blocking escape behaviors. During the DRA plus blocking condition, the amounts of self-injurious behavior reduced further than the other two treatments for both participants. Conclusively, the authors recommend when problem behavior is exhibited throughout transitional periods for individuals diagnosed with developmental disabilities, they could potentially benefit from treatments that involve creating interventions based on results of functional behavior analyses. Furthermore, these analyses can be used to find the precise factors that surround a given problem behavior associated with transitioning to be able to create the most beneficial intervention for that individual.

There are various interventions that can be implemented to aid transitional periods (Waters et al, 2009), some of which involve the use of a visual aid (picture schedule) to give the individual a visual cue about the upcoming change in activities. These picture schedules can be individualized to fit the specific person and the activities they prefer in order to facilitate transitional periods.
Visual Supports to Aid Transitional Periods

Hovanetz, Lerman, and Waters (2009) examined visual schedules as a function-based treatment separately and in combinations with other methods to potentially reduce problem behaviors that occurred during transitional periods. The participants in their study included two 6-year-old boys, with autism spectrum disorder, and were shown to behavior during transitions in multiple different environments/settings. The researchers conducted functional analyses of the problem behavior for each participant. They found that the problem behaviors were occurring because the participants were attempting to avoid non-preferred activities so they could have access to preferred activities. After demonstrating these results through the FBA, a treatment phase (visual picture schedule) was implemented during the transition to facilitate this change from the preferred activity to the non-preferred activity. However, the results of this study showed that visual schedules alone were not effective at lowering the behavior problems when transitioning from preferred to non-preferred activities. The problem behavior was able to decrease for both participants when the behavior was ignored (extinction) and other behaviors were reinforced instead (differential reinforcement of other behavior), regardless of whether the picture schedule was used.

In addition, Dettmer, Ganz, Myles, and Simpson (2000) utilized an arrangement of different visual intervention for two elementary–aged boys diagnosed with autism. They used multiple different visual aids to determine if they would have an effect on the latency of transitional periods. Therefore, the purpose of this study was to examine the effects of using various visual supports that included visual schedules, sub-schedules, finished boxes and timers to facilitate during transitional periods. The efficiency of the
visual aids were analyzed using a reversal design that consisted of a two baseline phases and two treatment phases in an alternating fashion (ABAB). The results of the data presented a large reduction in the latency between the times the participants were given instructions to begin a new activity and the time they began that next activity when the different visual aids were used. The utilization of visual aids also reduced the total number of support and prompts provided by the teacher in order for the participants to successfully transition from one activity to the next. Overall, this study supports the concept that visual treatments can benefit students diagnosed with Autism.

**Purpose**

Transitioning skills have been identified as problematic for individuals with autism spectrum disorder because they can potentially result in problem behaviors. The purpose of the proposed study was to teach a child to utilize a picture schedule by using a least-to-most prompting strategy and two different procedures that have been used in previous research. These procedures were used to implement a visually oriented intervention to help facilitate transitions and reduce those problem behaviors associated with transitions. The first procedure included conducting a functional behavior assessment (FBA) to determine that the problem behaviors were a function of escape. This will demonstrate that the behaviors were a result of those transitional periods because the child was trying to escape or avoid that change from one activity to another. The second procedure included implementing a picture-schedule between activities throughout the participant’s school day. The picture schedule was presented to the participant following the end of one activity and preceding the start of another activity. The proposed study was expected to show that problem behavior would occur at a high frequency or for a longer duration during baseline condition (prior to treatment). In addition, it was predicted that the
proposed method of presenting a picture schedule before transitioning between activities would reduce the frequency or duration of problem behaviors that occurred during this time on behalf of the participant.
CHAPTER II
METHOD

Participants

The participant was one 4-year-old boy diagnosed with autism spectrum disorder that attended an early intervention classroom for 3 hours a day, 4 days a week. This participant was identified to present problem behaviors during transitional periods between the various activities included in the classroom schedule. These problem behaviors included him often becoming distracted or yelling (verbal protests) at the behavioral therapists after he finished one activity and was instructed to move on to another activity.

Recruitment of Participants: The student in the classroom was recruited once he was identified by the program supervisor to present problem behaviors while transitioning between activities. Once he was identified as such, we discussed with his parents about the problem behaviors that occurred during these situations and asked them if they were interested in participating in the study. Once they agreed, they were given a copy of the Parental Consent Form to read over, sign, and return. (See Appendix C)

Materials

Data Sheets: There were two different data sheets used for this study. The first data sheet that was used included 15 days/sessions where the participant’s data was recorded daily by tallying the occurrences of problem behavior that correspond with that day/session. The participant’s problem behavior was operationally defined with their corresponding measurement procedures before any data were recorded. (See Appendix A) The second data sheet that was used included 10 treatment sessions where the participant’s total number of prompts needed could be recorded by tallying the occurrence of each prompt necessary throughout the day during
transitional periods. The prompts that were included in this data sheet were independent, gestural, verbal, model, partial physical, and full physical. (See Appendix A)

Functional Behavior Assessment: (See Appendix B) Questions About Behavioral Function (QABF) was conducted to identify the function of the participant’s problem behavior during the transitional periods. This questionnaire is a measurement system designed for the functional assessment of a given behavior and rates how often the individual engages in the behavior for situations where it usually occurs in order to identify the reasons why that behavior is occurring by identifying its functional purpose. The QABF is an indirect assessment of behavioral function that consists of 25 items. Each item is directly correlated with one of five categories reflecting the behavioral functions of attention, escape, physical, tangible, and non-social. In addition, each item is presented in a ranking format to be scored as either X (Doesn’t apply), 0 (Never), 1 (Rarely), 2 (Some), or 3 (Often). The goal of this assessment was to identify a function for each problem behavior to determine that the behavior’s function was a result of the transitional period by scoring highly in the escape category of the assessment. This assessment was conducted between the primary investigator and another behavior therapist that worked in the classroom that had direct experience with the participant’s problem behavior during transitions. The assessment was completed in an interview format with the behavior therapist to cover each of the 25 items and was completed in the work office to eliminate any possible distractions. Afterwards, an intervention was created to potentially decrease the frequency of problem behavior demonstrated during that transitional period.

Picture schedule: The picture schedule was a laminated strip of paper with two vertical Velcro strips to place the various pictures on. Also, an envelope was attached at the bottom of the strip of paper to place pictures in when the activities were finished. The left Velcro strip
presented all of the pictures that were included in the participant’s day in the classroom. The pictures were lined up in a corresponding way to match the overall schedule in the classroom. The right Velcro strip was utilized for the placement of a single picture corresponding to the current activity that the participant was engaging. The individual pictures paralleled the activities that were included in that day’s activities in the classroom (e.g., circle time, work-time, free-choice, gym, recess, and snack-time). It also included various pictures of toys and activities that were individualized for the participant and were based on the toys/activities that they preferred to engage in throughout their day and free-choice time.

*Hand counter:* This device was used to track the frequency of problem behavior during baseline and treatment conditions. Inside the hand counter there were four number rings that each range from 0-9 allowing the counter to reach a maximum of 9,999. Pressing a button located beside the numbers activated the counter and caused the first ring to advance one number. To reset the counter, a knob was located on the side and could turn all the rings back to zero.

**Setting**

Baseline and treatment condition sessions took place in the early intervention classroom that the participant attended 4 days a week. Each session was conducted throughout the day when the participant had to transition between all of the different activities that were scheduled in the classroom. The classroom consisted of many different toys and activities for the child to engage with, plus a working area where the behavioral therapists conducted discrete trial training sessions to work on specific goals for each of the students. The work area included a small table and two chairs for the student and the behavioral therapist to sit across from each other while working on their goals.
**Dependent Measures**

The primary dependent variable was the frequency of problem behaviors for the participant during baseline and treatment conditions. Each problem behavior was operationally defined for the participant. The first problem behavior that the participant exhibited was the amount of redirection. Once it was time to move from one activity to another, the participant would often become distracted by running away and playing with various toys rather than engaging in the next activity that was instructed to him. He would then need to be verbally or physically redirected to the appropriate activity. The second problem behavior that he presented during transitional periods was the frequency of verbal protests/outbursts. The participant would often yell or scream at the behavior therapist when it was time to end an activity and move to another activity.

The primary independent variable was the implementation of the picture schedule before the transitional period occurred to provide a visual cue before changing activities. This was used to measure the effect the picture schedule had on the participant’s problem behavior during the transitional phase.

*Inter-Observer Agreement (IOA):* Total count IOA was calculated for the participant’s defined problem behaviors before any baseline or treatment data was recorded. This indicated the degree to which two independent observers reported the same values for the occurrences of problem behavior that the participant engaged in during each transitional phase throughout a given day. The primary investigator and a behavior therapist that worked within the classroom conducted this. The 2nd observer had direct experience with the participant’s problem behavior during transitions. They were provided with the operational definition of the problem behavior and its corresponding measurement procedures to record it throughout the day during transitional
periods. At the end of the day, total count IOA was calculated by dividing the smaller of the two observers’ counts by the larger count and multiplying by 100. An IOA of 80% or greater would indicate that the observed problem behaviors were accurately being recorded.

*Redirectation* was defined as any instance of the participant running away and needing to be verbally or physically redirected to the appropriate activity that was instructed of him during transitional periods. *Verbal Protests* were defined as yelling or screaming loudly towards the behavioral therapist during transitional periods. Total count IOA resulted in a mean agreement of 84% for distractibility and 80% for verbal protests.

**Research Design**

An AB design was used in this study to visually analyze the effects across a baseline and a treatment condition. The baseline condition started on the first session and lasted until the participant showed a stable rate of responding. A stable rate of responding was described as at least three sessions in a row that have no more than 3 data points in difference. When stable baseline responding had been attained for the participant, the independent variable (activity schedule) was implemented to that subject. Additionally, treatment did not finish until the data measured during this phase regained stability.

**Experimental Conditions**

*Questions About Behavioral Function (QABF)*

This functional behavior assessment was conducted before the baseline and treatment conditions in order to determine that the participant’s problem behavior was a direct function of the transitional period that occurred. Since the behavioral therapists in the classroom were most familiar with the occurrences of problem behavior associated with each transitional phase, one of them was asked to participate in the QABF interview that the primary investigator lead in the
work office before any data on the behavior was recorded. The behavior therapist was asked to rank each of the 25 items that were included in the assessment. During the interview process, we went over each item individually and related it to the behavior that was being measured.

**Baseline**

During baseline conditions, the frequency of each problem behavior during transitional periods between activities were observed and recorded for the participant without the implementation of the picture schedule that preceded the transition. This gave an idea of how often the problem behaviors occurred naturally during those transitions before progressing to the treatment condition. Therefore, data was recorded starting at the end of one activity until the participant began the next activity by measuring the occurrence of each separate problem behavior with a hand-counter.

**Treatment**

During treatment condition, the frequency of each problem behavior was also recorded during each transitional period throughout the day for the participant with the implementation of the picture schedule. The treatment condition was implemented for the participant once he demonstrated stable baseline data. The treatment condition involved implementing a picture-schedule at the end of one activity and preceding the transition to the following activity to facilitate the transition between those two activities.

This process involved presenting the picture schedule at the end of a given activity, and then the primary investigator would verbally say “__(Activity)__ all done”. Afterwards, a least to most prompting hierarchy (described below) was used to engage the participant to take the picture correlated with the present activity, and place that picture in the envelope at the bottom of the Velcro strips (indicating that activity is finished). Following this, the participant was
instructed to look at the next picture in the schedule by verbally asking, “What’s next?” Again, a least to most prompting hierarchy was used to engage the participant to move that picture to the right Velcro strip (indicating the current activity that the participant needed to transition to). Data was recorded during this phase by counting the frequency of each problem behavior after the picture-schedule was presented until the participant started to engage in the next activity.

The least to most prompting hierarchy that was previously mentioned involved utilizing the least intrusive prompt needed to successfully engage the participant to move the pictures on the picture schedule to their appropriate spots. When the participant was unsuccessful at independently grabbing the picture and moving it to its appropriate spot after the least intrusive prompt was delivered, then the primary investigator would move to the next intrusive prompt as necessary to successfully engage the participant to complete the procedure. Therefore, progression up the hierarchy would occur only when the participant failed to respond to the given prompt.

The least intrusive prompt involved the natural cue of either saying “all done” or “what’s next?” The next prompt in this hierarchy was a gestural prompt and involved pointing to the given picture and its correct spot to move it to for the participant to see. If the participant was still unable to complete the task using these prompts, the researcher proceeded to a verbal prompt of saying, “move the picture”. The next intrusive prompt included modeling the procedure and involved the researcher showing the participant how to complete the task by taking the given picture and moving it to its appropriate spot and then giving the picture schedule to the participant for them to complete the task on their own. However, if they were still unable to complete this, the researcher would move to the next intrusive prompt of using a partial physical aid to guide the participant to reach for the picture, take it off the Velcro strip, and move it to the
appropriate spot on the schedule. The most intrusive prompt involved using a full physical prompt by means of hand-over-hand to have the participant complete the entire task.

**Hypotheses**

The following hypotheses were developed for this study:

1) **Null Hypothesis:** problem behavior will occur at a high frequency during baseline conditions (prior to treatment) for the participant.

2) **Problem behavior will decrease from the baseline data that is recorded after the treatment condition is implemented for the participant.**

3) **The proposed method of presenting a picture schedule before transitioning between activities will reduce the frequency of problem behaviors that occur during this time on behalf of the participant.**
Questions About Behavioral Function (QABF)

Figure 1 demonstrates the results of each QABF assessment that was completed for the participant’s problem behaviors before any baseline or treatment data was collected. The first problem the participant exhibited during transitional periods was the amount of times he became distracted and needed to be redirected. This would occur after an instruction was given to him to end one activity and move on to another activity. During this time, he would often run away to play with other toys in the classroom or try to engage in other activities that were not instructed of him, he would then need to be redirected to the appropriate activity. The QABF rated distractibility/redirection highest in the escape category of the assessment with a score of 10. It also rated the behavior high in the automatic and the tangible category of the assessment with scores of 7 and 6 accordingly. The second problem behavior the participant showed during transitions was the frequency of verbal protests towards the behavioral therapists. This behavior would also occur after he was instructed to end one activity and begin a different one. The verbal protests included him screaming or yelling “no!” at the behavioral therapist. The QABF rated this behavior highest in the escape category of the assessment with a score of 9 and second highest in the tangible category with a score of 6.
Figure 1 - Results of the Questions About Behavioral Function for each problem behavior
Baseline

Baseline data began on the first session after a successful IOA was observed and lasted 5 sessions. Overall, the five sessions demonstrated a stable rate of responding for both behaviors between each session’s data points. Stable rate of responding was defined as data points within a three-point range of the previous session. Figure 2 presents the baseline data for the first 5 sessions of the study. This is displayed on the left side of the dashed line before any treatment sessions began. The closed circle represents how often the participant became distracted and needed to verbally or physically redirected to the appropriate activity. The data for this behavior ranged anywhere from 10-13 instances per session between the various activities in the classroom for the three hour period. The closed triangle represents the frequency of verbal outbursts towards the behavioral therapist that the participant would engage in during transitional periods. The data for this behavior ranged between 5-8 instances per session during the transitional periods for the three-hour period.

Treatment

Treatment data began on the sixth session after a stable rate of responding was observed during baseline. Data was recorded during treatment sessions throughout each transitional phase with the implementation of the picture schedule. Figure 2 also presents treatment data for each session and is displayed on the right side of the dashed line. Again, the closed circle represents the total frequency that the participant became distracted and needed to be redirected to the current activity for each session. The data for this behavior reduced to 8 instances on the first treatment session and continued to decrease to 3 instances per session by the last two days of treatment. The closed triangle
represents the total frequency that the participant engaged in verbal protests towards the behavioral therapist between activities for each session. This behavior reduced to 3 instances on the first day of treatment and continued to decrease to zero by the last treatment session. Overall, there was a gradual descending trend across the treatment phase for both problem behaviors once the picture schedule was implemented.

Figure 2- Frequency of problem behavior during baseline and treatment sessions
Furthermore, during this phase, the participant was taught to use the picture schedule between the various activities in the classroom routine by using a least to most prompting hierarchy. During the first treatment session, the participant needed various prompting strategies to successfully move the pictures to their correct spots. During this session, the participant was only able to independently move the pictures to their correct spots 13% of the time after the picture schedule was presented to him. However, the participant showed a large increase during the second treatment session by demonstrating 60% independence when moving the pictures to their appropriate spots on the picture schedule before transitioning to the next activity. On the 3rd session, the participant continued to show an increase of independence to 68% when engaging with the picture schedule and sometimes only needed a gestural or verbal prompt to successfully move the pictures. Between the 4th treatment session and the last treatment session, the participant continued to increase his independence skills to 80% or higher when engaging with the picture schedule. In addition, when he needed to be prompted to correctly move the pictures he would only need either a gestural prompt or a verbal prompt rather than the intrusive prompting strategies that he needed before (modeling, partial physical, or full physical). By the last treatment session he exhibited 93% independent responses when using the picture schedule. Figure 3 presents the results of the percentages of prompts needed for each session to successfully engage with the picture schedule during transitional periods.
Figure 3- Percentage of prompts needed during treatment sessions
CHAPTER IV
DISCUSSION

Distractibility was rated highest in the escape category of the assessment, which demonstrated that the participant tended to engage in this behavior during transitions to avoid the task that is being asked of him. In addition to those functions, the QABF also rated the behavior fairly high in the tangible and automatic portions of the assessment showing that the participant would also tend to become distracted because it was reinforcing for the child outside of social influences and that it allowed the participant to have access to tangible items in the classroom that the participant wanted.

Verbal Protests was also rated highest in the escape category of the assessment, demonstrating that the participant engaged in the verbal protests to escape work, learning situations, or when the child was instructed to go an activity that the child didn’t want to focus on at the time. Verbal protests was also rated second highest in the tangible section of the QABF showing that the participant would also start protesting to the behavioral therapist when the child wanted to have access to a specific toy or activity in the classroom that was different then the activity that was instructed to them to proceed to.

Baseline and Treatment

It was hypothesized that problem behaviors would occur at a higher frequency during baseline conditions (without the picture schedule). The participant presented a high stable rate of responding during this phase for 5 consecutive sessions. Between all of the transitions in the classroom during the daily routine, the participant consistently needed to be verbally/physically redirected to the appropriate activity because the participant would often become distracted and try to engage with other items in the
classroom or activities that were not instructed of the participant. Once the child was being redirected, they would then start yelling “no!” or scream towards the behavioral therapist.

After 5 days of stable baseline data the treatment phase was implemented. During this time, a picture schedule was presented to the participant before a transition would occur and a least to most prompting hierarchy was used to successfully teach the participant how to use the picture schedule. At first, the participant needed more intrusive prompting strategies to get them to successfully move the pictures to their appropriate spots on the picture schedule. This included using partial or full physical prompting, modeling, and verbal prompting during the first 3 days. However, after the first treatment session, the participant demonstrated that they learned how to move the pictures to their appropriate spots on the schedule by showing an increase in independent responses from 13% to 60% on second session. By the fourth treatment session, the participant continued to show an increase in using the picture schedule by demonstrating 80% independent responses. From the 5th treatment session to the last treatment session, the participant was able to increase his independence with picture schedule to 93% and would occasionally need gestural prompts (pointing to the correct picture or pointing where to move the picture) to move the pictures to their appropriate spots.

In addition to learning how to use the picture schedule, the participant’s frequency of both problem behaviors reduced from the baseline condition and continued to reduce till the last treatment session. For example, if an activity was finished and it was time to move to a new activity, the picture schedule would be presented to him and the researcher would say “___ (activity) ___ is all done”, the participant would then move the
corresponding picture into the envelope. The researcher would then ask the participant, “What’s next?” and the participant would look at the next picture on the schedule and say the next activity on schedule while moving that picture over to the next Velcro strip (indicating current activity). Once the participant moved the picture, they would walk over to the next activity with little redirection or verbal protests towards the behavior therapist. By the last treatment session, the participant’s verbal protests reduced to 0 instances per day and the amount of verbal/physical redirection also reduced to 3 per day throughout all the transitions in the classroom routine. However, there was a spike in responding from 0-2 verbal protests on the 11th session. This occurred because a new bathroom picture was introduced to the picture schedule because the participant started potty training. Once it was time to use the bathroom, the picture schedule was presented to the participant and they would move it to its appropriate spot independently.

Conversely, the participant did not want to actually go to the bathroom so they started yelling at the behavior therapist during this transition. By the last treatment session, the picture of the bathroom did not cause the verbal protests and the participant was able to walk over to the bathroom with little to no redirection.

Furthermore, after the study was completed, the participant’s parents received a picture schedule to use in their home with any pictures they would need. After about a week, the researcher discussed with the parents about how the picture schedule was working for the child and they reported that their child consistently uses it between mealtimes, hygiene routines (bath time, brush teeth, getting dressed, etc.), bedtime, and for other activities in their daily routine at home. Moreover, they also reported that they do not need to instruct their child where to go every time their child is done with one
activity as much as they needed to before they had a picture schedule. This is an important development because it highlights that the participant was able to generalize this skill to another setting (home) and across other people (parents).

Past research has also focused on implementing visual aids during transitional periods. This was often used with children with autism spectrum disorder that had behavioral problems when transitioning from one activity to another. The study by Dettmer, S., Ganz, J. B., Myles, B. S., Simpson, R. L. (2000) used a variety of visual supports for two elementary-aged children diagnosed with autism that had trouble during transitions. Their study focused on the latency (how long it took the participants to end one activity and begin a new activity) of transitions for each participant. They found that with visual supports, the latency decreased from both baseline phases for both of the participants. They also found that with the visual supports in place, the researchers did not need to prompt them as much as they needed to before in order for them to successfully transition to the appropriate activity. This relates to the current study because the participant in this research also showed an increase in independent responding while using the picture schedule, demonstrating that he did not need to be prompted as much as before to transition to the next activity. Furthermore, while the past research demonstrated a decrease in the time it took to transition using visual aids, the current research demonstrated a decrease in the problem behaviors associated with transitional periods using a picture schedule. Therefore, using visual supports during transitions could possibly reduce the latency and the problem behaviors associated with these periods for children diagnosed with autism that have similar transitional concerns.
In conclusion, the use of a picture schedule by the participant resulted in a reduction of both of the participants’ problem behaviors to a low stable amount. In addition, using the least-to-most prompting strategy helped the participant to learn how to use the picture schedule independently so the participant could transition to activities with little prompting. Overall, this highlights a possible effective tool to deal with problem behaviors during transitional periods for children with autism spectrum disorder or other developmental disabilities.

**Limitations**

The results of the study should be interpreted with caution. First of all, only one participant could be recruited for the current study due to lack of students with transitional concerns. Therefore, the picture schedule demonstrated to have an effect on these specific participant’s problem behaviors during transitional periods but may not generalize to other children with similar behavior concerns. In addition, the participant for the current study was able to respond very quickly with the least-to-most prompting hierarchy teaching method but this may not be the case for other children with different learning styles. Consequently, the results of this study might not be representative of other children with autism spectrum disorder.

Past research has shown that visual aids do not always work during transitional periods for some children with similar transitioning concerns. For example, the study by Hovanetz, Lerman, & Waters (2009) evaluated the effects of both visual aids and interventions that involved differential reinforcement procedures for two 6 year old boys with autism spectrum disorder that had transitional problems. They found that the visual aids alone were ineffective at reducing the participant’s problem behavior. However, they
determined that using procedures that involved reinforcing other behaviors (besides problem behaviors) during transitions, the behaviors decreased for both participants regardless if the picture schedule was used. This highlights the fact that using visual aids during transitional periods might not work for other children with autism that have similar transitional concerns.

Next, the design of the study did not involve any replication of phases since it was an A-B design. This design was able to show an affect across one baseline and one treatment phase. However, if there were multiple baseline and treatment phases showing the same results, there would be greater reliability.

**Recommendations for Future Research**

Future research should focus on implementing similar methods, but with multiple participants and more replication. For example, it might be beneficial to collect data on a multiple baseline design across different participants to find that similar results would be produced for each participant. Another possible method might involve implementing an ABAB design for the participant to show that the data would be consistent across all baseline and treatment phases.

Furthermore, per parent report, the participant was able to continue this skill and use the picture schedule in his home environment with his parents after the study was completed. Therefore, the participant was able to generalize using the picture schedule across different situations and with other individuals. Future research should also focus on the generalization of this skill for each participant involved. This could be determined by collecting data in other environments (classroom, home, community settings, etc.) for
each participant after they originally learn the skill to determine if they demonstrate the same results across multiple places or with different people using the picture schedule.
References


### Data Sheet for Occurrences of Problem Behavior

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### Data sheet for Prompts Needed for Each Treatment Session

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Appendix B- Questions About Behavioral Function

**QUESTIONS ABOUT BEHAVIORAL FUNCTION (QABF)**

*Paclawskyj et al (2000)*

Rate how often the student demonstrates the behaviors in situations where they might occur. Be sure to rate how often each behavior occurs, not what you think a good answer would be.

\[ X = \text{Doesn't apply} \quad 0 = \text{Never} \quad 1 = \text{Rarely} \quad 2 = \text{Some} \quad 3 = \text{Often} \]

<table>
<thead>
<tr>
<th>Score</th>
<th>Number</th>
<th>Behavior</th>
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<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Engages in the behavior to get attention.</td>
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<tr>
<td>2.</td>
<td></td>
<td>Engages in the behavior to escape work or learning situations.</td>
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<tr>
<td>3.</td>
<td></td>
<td>Engages in the behavior as a form of &quot;self-stimulation&quot;.</td>
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<td>4.</td>
<td></td>
<td>Engages in the behavior because he/she is in pain.</td>
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<td>5.</td>
<td></td>
<td>Engages in the behavior to get access to items such as preferred toys, food, or beverages.</td>
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<td>6.</td>
<td></td>
<td>Engages in the behavior because he/she likes to be reprimanded.</td>
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<td>7.</td>
<td></td>
<td>Engages in the behavior when asked to do something (get dressed, brush teeth, work, etc.).</td>
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<td>8.</td>
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<td>Engages in the behavior even if he/she thinks no one is in the room.</td>
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<td>9.</td>
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<td>Engages in the behavior more frequently when he/she is ill.</td>
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<td>10.</td>
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<td>Engages in the behavior when you take something away from him/her.</td>
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<td>11.</td>
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<td>Engages in the behavior to draw attention to himself/herself.</td>
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<td>12.</td>
<td></td>
<td>Engages in the behavior when he/she does not want to do something.</td>
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<td>13.</td>
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<td>Engages in the behavior because there is nothing else to do.</td>
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<td>14.</td>
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<td>Engages in the behavior when there is something bothering him/her physically.</td>
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<td>15.</td>
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<td>Engages in the behavior when you have something that he/she wants.</td>
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<td>16.</td>
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<td>Engages in the behavior to try to get a reaction from you.</td>
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<td>17.</td>
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<td>Engages in the behavior to try to get people to leave him/her alone.</td>
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<td>18.</td>
<td></td>
<td>Engages in the behavior in a highly repetitive manner, ignoring his/her surroundings.</td>
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<td>19.</td>
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<td>Engages in the behavior because he/she is physically uncomfortable.</td>
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<td>20.</td>
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<td>Engages in the behavior when a peer has something that he/she wants.</td>
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<tr>
<td>21.</td>
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<td>Does he/she seem to be saying, &quot;come see me&quot; or &quot;look at me&quot; when engaging in the behavior?</td>
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<tr>
<td>22.</td>
<td></td>
<td>Does he/she seem to be saying, &quot;leave me alone&quot; or &quot;stop asking me to do this&quot; when engaging in the behavior?</td>
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<td>23.</td>
<td></td>
<td>Does he/she seem to enjoy the behavior, even if no one is around?</td>
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<td>24.</td>
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<td>Does the behavior seem to indicate to you that he/she is not feeling well?</td>
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<tr>
<td>25.</td>
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<td>Does he/she seem to be saying, &quot;give me that (toy, food, item)&quot; when engaging in the behavior?</td>
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<tr>
<th>Attention</th>
<th>Escape</th>
<th>Non-social</th>
<th>Physical</th>
<th>Tangible</th>
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Total | Total | Total | Total | Total
QABF Scoring

Attention
1. Engages in the behavior to get attention.
6. Engages in the behavior because he/she likes to be reprimanded.
11. Engages in the behavior to draw attention to him/herself.
16. Engages in the behavior to try to get a reaction from you.
21. Does he/she seem to be saying “come see me” or “look at me” when engaging in the behavior?

Escape
2. Engages in the behavior to escape work or learning situations.
7. Engages in the behavior when asked to do something (brush teeth, work, etc.)
12. Engages in the behavior when he/she does not want to do something.
17. Engages in the behavior to try to get people to leave him/her alone.
22. Does he/she seem to be saying “leave me alone” or “stop asking me to do this” when engaging in the behavior?

Non-social
3. Engages in the behavior as a form of “self-stimulation”.
8. Engages in the behavior even if he/she thinks no one is in the room.
13. Engages in the behavior because there is nothing else to do.
18. Engages in the behavior in a highly repetitive manner, ignoring this/her surroundings.
23. Does he/she seem to enjoy the behavior, even if no one is around?

Physical
4. Engages in the behavior because he/she is in pain.
9. Engages in the behavior more frequently when he/she is ill.
14. Engages in the behavior when there is something bothering her/him physically.
19. Engages in the behavior because she/he is physically uncomfortable.
24. Does the behavior seem to indicate to you that he/she is not feeling well?

Tangible
5. Engages in the behavior to get access to items such as preferred toys, food or beverages.
10. Engages in the behavior when you take something away from him/her.
15. Engages in the behavior when you have something he/she wants.
20. Engages in the behavior when a peer has something he/she wants.
25. Does he/she seem to be saying “give me that (toy, item, food)” when engaging in the behavior?

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<td>14. physical prob</td>
<td>15. you have</td>
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<td>16. reaction</td>
<td>17. alone</td>
<td>18. repetitive</td>
<td>19. uncomfortable</td>
<td>20. peers has</td>
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Central Washington University
Research Participant Informed Consent/Parent/Guardian Permission Form

**Research Title:** The Use of a Visual Aid to Facilitate Transitional Periods for Children Diagnosed with Autism Spectrum Disorder

**Principal Researcher:** Stevi Barrio, Graduate Student (MS Applied Behavior Analysis), Department of Psychology, brownste@cwu.edu, (360) 589-9819

**Faculty Sponsor:** Dr. Ralf Greenwald, Associate Professor, Department of Psychology, greenwar@cwu.edu, 509-963-3630

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1) **What you should know about this form:**

- Your son/daughter is being asked to join a research study.
- This form explains the research study and your son/daughter’s participation in this study.
- Please read this form carefully.
- Feel free to contact the researcher if you have any questions about your child participating in the study.
- Your son/daughter is a volunteer.
- If at any point you do not feel comfortable with your child’s participation in the study, you may remove them at any time.
- Verbal agreement will be obtained from your son/daughter throughout the study.
- The researcher will be sure to talk with you about any new information that may affect your son/daughter’s participation in the study.

2) **Why is this research being done?**

This study is being done to see if visual supports could possibly help children with Autism Spectrum Disorder who have problems transitioning between activities. The purpose of the study is to use a visual tool as a method to help increase smooth transitions. It is also being done to see if it lowers any problem behaviors connected to those transitions. The study will use two different procedures that have been shown to be successful in past research. First, it involves using an assessment of your child’s problem behavior to determine if that behavior...
happens because of the transition between activities. It also involves teaching your child how to use a picture schedule. The picture schedule will be shown to your child after finishing one activity and before beginning another activity. It is hoped that showing a picture schedule before transitioning between activities will lower how many problem behaviors that each child has during this time. I hope this research helps each of the children involved with the skill of transitioning.

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3) **Who can take part in this study?**
Children who are part of this study must be between the ages of 2 and 6. They must also have Autism Spectrum Disorder and attend the ABA Classroom Program at the Yakima Children’s Village. The child needs to show difficulty with transitional periods by having problem behavior. These behaviors can include not following directions, hitting, kicking, biting, flopping on the floor, running away, or any other problem behaviors. These behaviors need to happen between the different activities during class time.

4) **What will happen during this study?**
The study will take about 6-8 weeks (24-32 days) during your child’s regular 4 days week in the classroom. The study procedures will be in the following order:

1) **Behavior Assessment (QABF):** The functional behavior assessment (FBA) will determine each child’s problem behavior that happens between activities. The FBA consists of 25 questions and measures how often the child has the behavior. This assessment will be completed between the researcher and another behavior therapist that works in the classroom and has direct experience with your child’s problem behavior during transitions. It will be completed in the work office, not in the classroom or in the presence of your child. This assessment will be finished before any other phases begin. *The behavior assessment (QABF) will happen on a single day and take about one hour to complete.*

2) **Inter-Observer Agreement (IOA):** This phase will be done to determine how well a given behavior is measured between two different observers. This is to make sure that a behavior is being measured accurately. This will be completed between the primary investigator and another behavior therapist that works in the classroom. The behavior therapist will be provided with a description of the given behavior and how to measure it. If the behavior is frequency based, it will be recorded with a hand counter by counting the number of times the behavior occurs. If the behavior is duration based, it will
be recorded with a timer. The timer will start when the behavior begins and will stop when the behavior ends. The total duration or frequency will be recorded by each observer on a data sheet at the end of a day. The totals obtained by each observer will then be compared to determine if they recorded a similar amount of the given behavior.

3) **Baseline:** Problem behavior between activities will be recorded for your child to determine how often the problem behavior happens. Data will be recorded starting at the end of one activity until the child begins the next activity. This will be done by recording each problem behavior with a hand-counter or the length of each problem behavior with a timer.

*This phase will take about 8-20 days depending on the extent of your child’s behavior. Data will be recorded between each activity while your child is going to class during the 3 hour period.*

4) **Treatment:** Problem behavior will be recorded for your child between activities using a picture schedule. A picture schedule involves showing a picture schedule to your child at the end of a one activity. Then, the researcher will say “__ (Activity) __ all done”. After this, your child will be guided to take the picture that matches the current activity and put that picture in the envelope at the bottom of the picture schedule. This will indicate that the activity is finished. Next, the child will be told to look at the next picture in the schedule by asking, “What’s next?”. Again, your child will be guided to move the next picture to the right Velcro strip on the picture schedule. This will indicate the current activity that the child will need to transition to.

A least-to-most prompting procedure will be used to engage your child to use the picture schedule appropriately. The least-to-most prompting procedure (described below) will involve using the least intrusive prompt needed to successfully engage your child to move the pictures on the picture schedule to their appropriate spots. If your child is unsuccessful at independently grabbing the picture and moving it to its appropriate spot after the least intrusive prompt is delivered, then the researcher will move to the next intrusive prompt. This strategy will be used as necessary to successfully engage the participant to complete the procedure. Therefore, progression up the hierarchy will only occur only if your child fails to respond to the given prompt. The prompts include the following:

- **Least intrusive prompt:** involves the natural cue of either saying “all done” or “what’s next?”
- **Gestural prompt:** involves pointing to the given picture and its correct spot to move it to for your child to see.
- **Verbal prompt:** involves saying, “move the picture”.
- **Model prompt:** the researcher will visually show your child how to complete the task by taking the given picture and moving it to its
appropriate spot. Then, the picture schedule will be given to your child for them to complete the task on their own.

- **Partial physical prompt**: involves partially guiding your child to reach for the picture, take it off the Velcro strip, and move it to the appropriate spot on the schedule.
- **Full physical prompt**: involves using hand-over-hand to have your child complete the entire task.

The amount of problem behavior will be recorded with a hand-counter or a timer. This will be recorded after the picture-schedule is shown to the child until he/she starts the next activity.

*This phase will take about 10-22 days to finish depending on how long it takes for your child to show a decrease in behavior.*

5) **What are the risks or discomforts of this study?**

There is a possibility of discomfort while your son/daughter is in this study. Picture schedules are commonly used in classrooms and do not usually have any negative results. However, your child may have some level of discomfort if they are unable to complete what is asked of them when using the picture schedule between activities. This discomfort is no greater than any other discomfort they may have while learning different tasks in the classroom on a daily basis.

Before beginning the study procedures, your child will be asked “are you ready for class today?” If he/she exhibits any problem behaviors after asking this question (ex: aggression, yelling, non-compliance, etc.) or can verbalize that they are not ready (ex: saying “no”), then the study procedures will not be carried out for that day’s session.

6) **Will it cost anything to be in this study?**

This study will be done at no cost to you or your child.

7) **What are your options if you do not want to be in the study?**

Your son/daughter does not have to join this study. If they do not join, it will not affect any benefits to which they are entitled, nor will it change the way your child is treated at the Yakima Children’s Village.

8) **Can you leave the study early?**

If at any time you wish to end your child’s involvement in the study, you can do so immediately and with no negative results. If you wish to have your child stop at any time, please tell the researcher right away. If your child does leave the study early, the researcher may use information already collected from them.
There might be times in which the study may be ended for a short time. For instance, the session will be ended if your son/daughter has a high level of discomfort and begins to act in an irregular manner. If this happens, the researcher will then inform the classroom supervisor about your child’s behavior and why the session was ended early. Also, if at any point the classroom supervisor asks that a session be ended, it will be ended with immediate effect.

9) What information about you will be kept private and what information may be given out? 
Your son or daughter’s name will not be used in any report or write-up of the study. All data that is collected will be kept on a password-protected computer. Data will be entered using an identification number assigned to each child that is involved in the study. Only the researcher will know the password to the computer and the ID numbers for each child.

The study findings will be shared with the behavior therapists directly involved in the study. All data is confidential, however, confidentiality cannot be guaranteed. There will be approximately three students participating in this study and behavior therapists from your child’s program assisting with the behavior assessment. Consequently, some program staff may be able to identify the children who participated. Data that could be possibly shared with the program staff include the amounts of behavior that occur with each child during a session. The larger report will include only your child’s ID number when sharing the findings.

10) Will your child benefit from joining this study?
Your child may benefit from being in this study if the picture schedule/visual aid reduces the occurrences or durations of problem behavior during transitional periods.
After the study is over, your child will be provided with the same picture schedule they used during the study to use at home, school, or other environments that is a part of your child’s routine.

11) What other things you should know about this study?

a) Institutional Review Board (IRB):
This study has been reviewed by the CWU Human Subject Review Council. HSRC is made up of faculty from many different departments, ethicists, nurses, scientists, nonscientists and people from the local community. The HSRC’s purpose is to review human research studies and to protect the rights and welfare of the people participating in those studies. You may contact the HSRC if you have questions about your rights as a participant or if you think you have not been treated fairly. The HSRC office number is (509) 963-3115.
b) **What do you do if you have questions?**

If you have questions or concerns about the study, feel free to contact the researcher- Stevi Barrio at (360) 589-9819.

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**What does it mean if you sign this paper?**

You are not giving up any rights by signing this form. Your signature means that you understand the study plan. It also means that you have been able to ask questions about the information given to you in this form and that you are willing to allow your child to participate under the conditions we have described.

You have received a copy of this form.

Participants Name (Print): __________________________________________

Name of Parent/Guardian (Print): __________________________________________

Parent/Guardian Signature: _______________________________ Date: __________

Principle Investigator: _______________________________ Date: __________