Descriptive Assessment of Problem Behavior in Transitions Between Activities

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Abstract

Transitions between activities are reported to be difficult for children with autism. In this study, descriptive data from 6 children with autism were analyzed to determine which of the following six conditions were associated with the most frequent occurrence of problem behavior: non-preferred activities, preferred activities, transitions from non-preferred to other non-preferred activities, transitions from non-preferred to preferred activities, transitions from preferred to other preferred activities, and transitions from preferred to non-preferred activities. A preference assessment was later conducted which verified that the activities were in fact high- and low-preferred. Results of the descriptive assessment indicated that for all but one participant the highest proportion of transitions with problem behavior occurred when transitioning from high-preferred activities to low-preferred activities. These results indicate that examining the interaction between activities is important when studying problem behavior in transitions.
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Transitions from one activity to another are encountered in every person’s daily life. When children begin preschool, transitioning between activities becomes especially important (Sainato, 1990). Changes in activities take place regularly where the student might have to end preferred activities to begin activities that are less preferred, for example transitioning from recess to school work. Other transitions might occur throughout the day where the student changes between various work activities, from work activities to leisure activities or between different leisure activities. In addition, transitions might also involve physically moving from one location to another. Research in children with autism suggests that transitions can be difficult and may provoke challenging behaviors (Kern & Vorndran, 2000; Mash & Wolfe, 1999; Olive, 2004; Sterling-Turner & Jordan, 2007; Stoner, Angell, House, & Bock, 2007).

Although there is little empirical study of procedures for aiding in transitions, there are many general recommendations for making transitions easier. Structure, consistency and cues have been characterized as being important in transitions for children with autism (Flannery, O’Neill, & Horner, 1995). A prevalent and widespread intervention involves signaling the transition (Buck, 1999; Sterling-Turner & Jordan, 2007). This procedure derives from the hypothesis that the unpredictability of transitions is associated with increased likelihood of problem behavior (Flannery & Horner, 1994). Children with autism are reported to have behavioral difficulties when unexpected changes occur or there are inconsistencies in their daily routines (Mash & Wolfe, 1999). Also, due to delays in receptive and expressive language skills these children might not comprehend regular instructions regarding where they are going or what activity is next (Quill, 1995).

Making the environment more predictable and structured is a technique that has been
used to decrease problem behavior during difficult transitions or activities. For example, Sainato, Strain, Lefebvre, and Rapp (1987) used a bell that signaled the occurrence of a transition. The authors compared the effects of a peer-mediated versus an antecedent prompt on the rate of appropriate behavior of children with disabilities during transition times. Although the antecedent prompt, sound of a bell, was more effective in increasing the rate of movement during transitions it was not clear whether the sound was superior because of its predictability or reinforcing properties (Sainato et al., 1987).

To examine if the predictability of upcoming events affected transitions, Flannery and Horner (1994) evaluated the difference between signaled and un-signaled transitions. The authors implemented two conditions; in one the upcoming activity was signaled and in the other it was not. Participants engaged in less problem behavior in the signaled condition. To further confirm the results of Flannery and Horner (1994), Schreibman, Whalen, and Stahmer (2000) used a video priming method as a treatment for problem behavior during transitions. All the participants were exposed to a videotape of the upcoming event that was reported to be problematic in transitions. The hypothesis was that watching the video would increase the predictability of the transition and thereby decrease disruptive behavior associated with those specific transitions. Participants’ problem behavior decreased in the treatment phase. Although the authors noted that these results provided additional support for the predictability hypotheses, it was unclear what accounted for the decrease in problem behavior. The authors did not note what consequences were delivered for problem behavior. The decrease in problem behavior may have resulted if the children were not allowed to escape the aversive situation. Extinction effect of escape maintained behavior. Additionally it is possible that with repeated exposure to the transition, problem behavior could have improved without the video cue.
There have been studies that used more than one modality of cueing to facilitate transitions. Dooley, Wilczenski, and Torem (2001) used pictures, lights and a verbal cue to signal transition. When studying preschool child’s aggressive and disruptive behavior during transitions from one activity to another Dooley et al. used a picture schedule that signaled what daily activities were occurring and in what setting. When it was time to change between activities the researcher would turn off the lights and deliver a verbal cue. In addition the student received a pretzel for the completion of each task. The results implicated that a picture board and daily schedule improved the child’s behavior and independence. Although their treatment was effective it is not apparent what part of the treatment was effective (e.g., whether it was the use of the pictures, verbal cues or the pretzel). Signaling transitions has also been studied in terms of the effects on stereotypic behavior. Tustin (1995) investigated if giving advanced notice for a change would decrease the rate of stereotypy with a participant diagnosed with autism. His results indicated that with the advance notice the participant engaged in less stereotypy compared to when not given an advanced notice.

Although these studies have shown the effectiveness of cues there is more recent evidence that do not support these results. Also, the above mentioned research provides no clear explanation of how visual schedules or prompts affect transitions. More recent research has directly examined the effects of prompts on problem behavior during transitions or the conditions under which they might be effective. In Cote, Thompson and McKerchar (2005) the effects of two antecedent strategies were compared for compliance during activity transitions. The authors used a warning where the child was given 2-min notice before the delivery of the initial instruction. The second strategy was informing the participant that she or he could bring a toy during the transition. The results showed that both interventions, warning and a toy, were
ineffective in increasing compliance with transitions. When the authors combined the two procedures with extinction, however, improvements in compliance were observed for all of the children (Cote et al.).

Waters, Lerman, and Hovanetz (2009) evaluated the separate and combined effects of visual schedules problem behavior during transitions. In addition, they implemented a function-based intervention for problem behavior that occurred during transitions. For both of their participants visual schedules alone were ineffective in reducing problem behavior when they transitioned from preferred to non-preferred activities. Also, when adding extinction and differential reinforcement of other behavior (DRO), both participants aberrant behavior during transitions decreased regardless of whether visual schedules were used.

Cues might be ineffective for transition problems when they are unrelated to the maintaining variables of problem behavior. Difficulties with transitions could also be related to what the individual did before the transition or what they are supposed to do after the transition (Kern & Vorndran, 2000). If the activity that is up-coming is aversive the student might engage in aberrant behavior (e.g., screaming, aggression, self-injurious behavior) to escape or avoid the activity. If the activity that the student is engaging in is preferred, the student might emit problem behavior when instructed to end the activity. Using functional assessment has proved to be successful for finding the maintaining variable and treatment for problem behavior (Iwata, Dorsey, Slifer, Bauman & Richman, 1994). To identify what is maintaining problem behavior during transitions recent studies have applied functional assessments. For instance, Kern and Vorndran attempted to identify whether particular transitions with one participant were associated with occurrence or non-occurrence of dropping to the floor (flopping). First the authors implemented a descriptive assessment where they collected data throughout the day.
Two hypotheses of the maintaining variables for flopping was tested. One was that flopping functioned as an access to preferred activities and the other was flopping was maintained by an access to adult attention. The hypotheses were evaluated with interventions based on those hypotheses. Both of the interventions resulted in reduction in challenging behavior but the intervention related to the access to adult attention eliminated challenging behavior.

McCord, Thomson and Iwata (2001) extended previous research by isolating the specific components of a transition and identifying the functions of problem behavior that occurred during transitions. The authors applied the functional analysis methodology to assess self-injurious behavior that was reported to be occasioned by transitions from one activity or location to another. Transition problems were examined as a function of a change from a preferred activity to neutral situation or from neutral situation to a non-preferred activity. The authors choose the preferred activities based on preference assessment and non preferred activities were chosen according to teachers reports. In addition transition in it self was assessed, irrespective of the on going activities. For both of their participants self-injurious behavior was maintained by avoidance of changing location regardless of the activity that was presented or terminated. To evaluate appropriate treatments McCord, Thomson and Iwata included a treatment analysis. They found that providing advance notice of a transition had little effect on SIB. Extinction and differential reinforcement of alternative behavior, however, was successful in decreasing SIB.

Using the same method as McCord et al. (2001), another study evaluated the utility of functional assessment of problem behavior during transitions with children with no developmental disabilities (Wilder, Chen, Atwell, Pritchard, & Atwell, 2006). The transitions that occasioned problem behavior for one of the participants was ending a preferred activity. For the other participant, it was the initiation of a certain activity. Differential reinforcement of other
behavior and extinction was effective in decreasing problem behavior for both of the participants. These recent studies not only illustrate the importance of identifying the function of a behavior before implementing a treatment but also that visual support is not often effective as a treatment.

Although in McCord et al. and Wilder et al. functional analysis was shown to be effective in identifying the function of problem behavior in transitions, these studies have not examined interaction between different activities that occur during transitions. For example, different effects on a child’s behavior may have been observed if the transition is between two non-preferred activities or between a preferred and non-preferred activity. Although this aspect of transitions has not been examined by applied researchers, it has been examined by basic researchers on transitions between different schedules of reinforcement. Transitions between different schedules of reinforcement could be analogous to transitions between different activities if we conceptualize preferred activities as a rich schedule of reinforcement and a non-preferred activity as lean schedule of reinforcement.

When looking at the basic literature pausing in laboratory animals is believed to be maladaptive as it results in delay in reinforcement. Usually pausing has been examined with animals when responding on a fixed ratio schedule or a fixed interval schedule. In a fixed ratio schedule the number of responses reinforced is constant from one reinforcer to the next (Catania, 2007). For example a pigeons’ peck is reinforced after every twenty pecks. With a fixed interval schedule the reinforcement is contingent responding after some period of time. For example on a fixed interval 5 min the response is reinforced every five minutes. Because pausing has been observed after the delivery of a reinforcer, this pausing has been called the post reinforcement pause (Catania, 2007). When examining more closely what causes the post reinforcement pause,
researchers have found that both the ratio size and the reinforcer magnitude affect pausing (Felton & Lyon, 1966; Powell, 1969). When Felton and Lyon increased a fixed ratio schedule in successive steps from a FR50 to FR150 a consistent increase in the length of the pause was observed. Powell (1969) was interested in examining the effect of holding the FR size constant but changing reinforcer magnitude. Results showed that the size of the reinforcer also affected the pause: the longer the reinforcement time, the shorter the pause (Powell, 1969).

Perone and Courtney (1992) attempted to examine these variables more closely. FR pausing was measured as a function of past and upcoming reinforcers of varying magnitudes in both mixed and multiple schedules. The mixed and multiple schedules consisted of alternating between two schedules of reinforcement. In mixed schedules stimuli are not correlated with each schedule component, however, in a multiple schedule, a stimulus is correlated with each schedule component (Catania, 2007). In Perone and Courtney’s study, a single color light was lit through all the conditions in the mixed schedule. For the multiple schedule, different color lights accompanied each of the ratios ending in either a small and large reinforcer magnitude. The procedure involved transitions of four types, categorized according to the magnitudes of the past and upcoming reinforcers were by in each session half of the ratios ended with a small magnitude of the reinforcer and half with a large magnitude of the reinforcer. This produced four types of transition schedules; small to small (a ratio with a small magnitude reinforcer followed by another small magnitude reinforcer). Small to large (a ratio with a small magnitude reinforcer followed by a ratio with a large magnitude reinforcer), large to small (ratio with a large magnitude reinforcer followed by a ratio with a small reinforcer) and, a large to large (a ratio with a large magnitude reinforcer was followed by another large magnitude reinforcer).
This manipulation of the past and upcoming reinforcer magnitudes allowed assessment of the overall effect of the past and upcoming reinforcer magnitudes as well as the interaction between them on pausing (Perone & Courtney, 1992). The study demonstrated that pausing was affected by two factors, immediate history of reinforcement and stimuli correlated with the upcoming condition. The longest mean pause was observed when the previous reinforcer was large and when there was a signal that the upcoming reinforcer was small. The effect of the upcoming and previous reinforcer was not observed under the mixed schedule. These results were replicated with rats in Wade-Galuska, Perone and Wirth (2005).

Wade-Galuska et al. investigated the generality of the effect from a transition of a favorable condition to an unfavorable condition. For that purpose the authors used rats and defined favorability in terms of response effort. Response effort was the amount of force required to press the lever. Two levers were in the operant chamber where one lever required high force and the second lever required a low force. As in Perone and Courtney (1992) Wade-Galuska et al. (2005) had the rats transition between four conditions; from low force requirements to high force requirements, from high force requirements to low force requirements, from high force requirements to high force requirements and finally from low requirements to low requirements. The study replicated Perone and Courtney’s findings that the rats’ pauses were longest in the transition from a schedule requiring presses on a low force lever to one requiring high force (Wade-Galuska, Perone & Wirth, 2005). In addition when the response requirements were increased for the high force lever the pause increased in the transition from low to high for some of the rats. These results raised the question if similar effects could be detected with human subjects.

Bejarano, Williams and Perone (2003) attempted to replicate these results with one
participant with developmental delays. The authors reinforced matching to sample responses on a multiple schedule. The responses were reinforced with money, either resulting in a rich component which was a quarter or a lean component, one cent. In addition they added another variable to those components were the lean component had also a larger response requirement than the rich component (Bejarano et al., 2003). Consistent with prior findings the longest mean pause occurred when the past schedule was rich and the signaled upcoming schedule was lean (Bejarano et al., 2003).

Although these studies demonstrate that stimuli correlated with rich to lean transitions increase pausing, this phenomenon has not been investigated thoroughly with human subjects in more natural settings. Could pausing under rich to lean transitions be a laboratory analogue for aberrant behavior seen in clinical populations when transitioning between different activities? In general school setting there is a difference in what activities students are changing from and to. For example there might be a frequent change from one work activity to another, or there might be a change from a play activity to a work activity. With that in mind it is likely that the past and the upcoming conditions affect responding as the basic literature has demonstrated.

Because literature on problem behavior and transitions has either focused on the activity that the child was previously presented or the activity that is signaled to come, interaction between activities has to be examined.

The purpose of this study was to develop a descriptive analysis of challenging behavior that considers the conditions both before and after a transition, and the interaction between those conditions.
GENERAL METHOD

Participants and settings

Participants were six children ranging from 6-8 years of age and diagnosed with autism spectrum disorders. All participants lived at home and attended a day school for children with developmental disabilities where they were staffed with a ratio of 1:1 to 1:2 during the school day (9 pm to 3 pm). The participants were noted by their clinical team to have problem behavior during transitions.

Jack was a six-year-old boy. His challenging behaviors were reported to occur when stereotypic behavior and repetitive routines were interrupted, when demands were placed, denied access to a preferred item or ending a preferred activity. Anne was a seven year old girl reported to display challenging behaviors that typically occurred in response to demands, denied access, and transitions. David and Jon were both seven-year-old boys. David’s challenging behaviors were reported to occur across environments and settings and Jon’s problematic times were reported to occur when ending a preferred activity (e.g., movie, computer and playground) as well as denied access or waiting for preferred items. Peter and Sven were both eight-year-old boys and their problem behavior were reported to be preceded by the presentation of non-preferred demands or denied access to preferred items, activities or routines.

The Descriptive Assessment (phase 1) and Preference Assessment (phase 2) were both conducted in the participant classroom setting.
PHASE 1: DESCRIPTIVE ASSESSMENT

Procedure and response measurements

Teachers in the participants’ classrooms collected the descriptive data. All of the teachers were graduate students either enrolled in special education or applied behavior analysis program. The experimenter met twice with the teachers to discuss the assessment and examples and non examples were reviewed.

Data collection was conducted for three days from 9 am to 3 pm and the teachers recorded on a data sheet their initials, time, location, activity, transitions between activity, and whether a problem behavior occurred during that activity or in transition between activities. The data sheets included definitions for transition and each participant’s problem behavior was identified.

Problem behavior was defined as those specified in participants’ behavior intervention plan with examples and non examples.

Jack’s target behavior were flopping, crying, trashing and aggression. Flopping was defined as any instance in which Jack moved from a standing or sitting position to the floor. Crying was defined as any instance crying with tears and aggression was defined as any instance of head-directed hitting (open or closed fist) or hair pulling, kicking, scratching, grabbing, or pinching another person with one or both hands, or grabbing another person’s clothes. Trashing was defined as any instance of ripping, throwing or intentionally pushing program and/or leisure materials onto the floor.

Anne’s target behavior was crying, screaming self injurious behavior, aggression and flopping. Self injurious behavior was defined as follows: Any instance of Anne using a closed or open hand, body part, or object to hit any area of head or face from a distance of 1 inch or
greater. This included hitting the top of the head, forehead, or the mouth. **Aggression** was defined as: Any instance Anne grabbing at another person’s body, hair, or clothing with hands including scratching and pinching. Also any instance of biting another person. **Flopping** was defined as falling to the floor from standing or seated position, falling over her knees with head down in a seated position or over her chair with stomach or back on the seat bottom.

David’s target behavior consisted aggression, self injurious behavior, flopping, elopement and property destruction. **Aggression** was defined as any instance of hitting, slapping, kicking, hair pulling, or scratching to another person. **Self injurious behavior** was defined as follows: Hitting his head to stationary object from a distance of 2 inches or greater, open or closed handed hit to any part of his head from a distance of 2 inches or greater, closed fisted hit to any part of his chin, neck, or mouth area from any distance, open or closed handed hit or kick to any part of body in a non-functional manner from a distance of 2 inches or greater. **Flopping** was defined as any instance of David’s buttocks or knees touching the floor without being instructed to do so. **Elocomotion** was defined as any instance of David moving more than 1 foot away from his teacher without being instructed to do so. Finally **property destruction** was defined as follows: Any instance of sweeping materials off desk/table, breaking materials, or throwing materials.

Jon’s target behaviors were flopping, crying and non compliance. **Flopping** was defined as any instance in which Jon moved from a standing or sitting position to the floor or leaning over to lie on the table. This included hands, head or any other part of the body making contact with the floor or table. **Crying** was defined as any instance in which Jon cried (with tears) for longer than 10 s, episode ended when Jon was free of crying for 10 s or longer. Finally **non compliance** was defined as any instance in which Jon was resistant to a teachers prompt or required a prompt for an independent skill, paired with flopping, pushing hands away or crying.
Peter’s target behavior were aggression, flopping, elopement and climbing. **Aggression** was defined as any instance of kicking, pushing, slapping, punching, pinching, or hair pull towards another person. **Elopement** was defined as any instance of moving more than 3 ft away from his teacher without being instructed to do so. **Flopping** was defined as follows: After initial instruction to transition between environments, Peter’s buttocks or knees touching the floor and not responding to the initial cue to stand up (within 10 s). **Climbing** was defined as any instance of attempted or actual standing / lying on furniture.

Sven’s target behavior were aggression, bolting, flopping, screaming, climbing and property destruction. **Aggression** was defined as any instance of engaging in head-directed hits (open or closed fist) or hair pulling, any instance of engaging in other than head-directed hitting (open or closed fist), kicking, scratching, grabbing, or pinching another person with one or both hands, or grabbing another person’s clothes. **Bolting** was defined as any instance of walking/running more than 3 ft from teacher without permission. **Flopping** was defined as any instance of falling to the floor without being instructed to do so when outside of his cubby, or not taking a rest and refusing to stand up within 10 s of an instruction to do so. **Screaming** was defined as any instance of screaming or emitting vocalizations above conversation level. **Climbing** was defined as any instance of standing / lying on furniture and refusing to get down within 10 s of an instruction to do so. Finally **property destruction** was defined as any instance of ripping, throwing or intentionally pushing program and/or leisure materials onto the floor, or any instance of pushing over furniture.

**Transition** was operationally defined as a change from one activity to another. Transition was recorded to begin when there was some signal, auditory or visual, that the activity was over (e.g., “trade in is all done”) and ended when the student made the first response to the new
activity. Activities were those that the student was engaging in at that time (e.g., work, playground, computer).

**Reliability**

A second observer simultaneously collected data during each activity and transitions. An agreement was defined if both observers agreed on whether a participant engaged in problem behavior when engaging in activity or transition. Agreement was calculated by dividing the number of agreements by the number of agreements and disagreements. Interobserver agreement was assessed for 30% of total hours for four of the participants with 99.4% agreement. It was not possible to collect IOA for the other two participants due to staffing constrains.

**Data Analysis**

Activities were divided into high and low preference activities. Those activities that involved leisure or trade-in activities were defined as high-preference (e.g., computer, play with toys, playground). Activities that involved daily academic activities for the student were defined as low-preference (e.g., academic work sessions, washing hands). Proportion of activities or transitions with problem behavior was analyzed in six conditions; low preferred activities, high preferred activities, transitions from low-preferred to other low-preferred activities (low-low), transitions from low-preferred to high preferred activities (low-high), transitions from high preferred to other high preferred activities (high-high) and transitions from high preferred to low-preferred activities (high-low). The proportion of low preferred activities with problem behavior was calculated by dividing total instances of problem behavior during low preferred activities with the total opportunities of engaging in low preferred activities. The proportion of high
preferred activities with problem behavior was calculated by dividing total instances of problem behavior during high preferred activities with the total opportunities of engaging in high preferred activities. For the transition conditions the proportion of each transition type with problem behavior (e.g., low-low, low-high, high-high, high-low) was calculated by dividing total instances of that transition type with problem behavior with the total opportunities of that transition type. For example if the student transitioned 12 times from high preferred activity to a low preferred activity and had problem behavior in 7 of those transitions the probability of transition from high-low with problem behavior would be 0.58 for that student.

Results

Figure 1 illustrates mean proportion of transitions with problem behavior. For Peter, Sven, Jon, David and Anne problem behavior occurred in highest proportion in transitioning from high preferred to a low preferred activity. Jack engaged in problem behavior in highest proportion of leaving high preferred activity irrespective of what the upcoming activity was. For Anne problem behavior occurred in highest proportion of transitioning to a low preferred activity. There was not much of a difference if the previous activity was high or low preferred. The results for David illustrate a similar profile to Anne. Peter, Sven and Jon all had similar results where the highest proportion of transitions with problem behavior was when going from a high preferred to a low preferred activity. Other transition types did not result in problem behavior. For all of the participants the transition type with the lowest proportion of problem behavior was when the previous activity was either low or high preferred and the upcoming activity was high preferred.

The mean proportions of activities with problem behavior are presented in table 1. All participants engaged in problem behavior in highest proportion of low preferred activities with
the exception of Jon. All participants, except David engaged in problem behavior in higher proportion during a specific transition type than actually when engaging in the activity. For David problem behavior occurred in higher proportion when engaging in low preferred tasks than when transitioning to low preferred tasks.

PHASE 2: PREFERENCE ASSESSMENT

To verify that the activities identified as preferred and non-preferred in the Descriptive analysis a preference assessment was conducted for all the participants.

Procedure

Prior to the start of the evaluation the researcher chose two work activities based on what the participants had engaged in the Descriptive assessment and two leisure activities based on teachers reports what the participant engaged in throughout the day. Sessions were conducted in the participant’s cubby in their classroom.

To evaluate the participant’s preference a concurrent-chain procedure was used. For the assessment 1.87 x 2.1 in pictures were used that matched each activity. For each participant there were four pictures, two for leisure and two for work activities. Responding by pointing to one of the pictures resulted in access to the corresponding activity. Prior to the concurrent choice trials, forced choice trials were conducted for each of the stimuli. Participants were physically guided to point to the picture presented and immediately were given the correspondent activity. Directly after the forced trials, six choice trials were conducted where two pictures were presented on a discrimination board in front of the participant. The student’s response, pointing to either of the two pictures, resulted in access to the activity. For example pointing to a picture of a computer resulted in access to the computer. The experimenter would wait 30 s. for a response and if none was emitted the next trial was presented. A total of two sessions were conducted so that the total
number of forced trials was eight and concurrent choice trials were twelve. Items were paired together in a randomized order.

When presenting the work activities the experimenter followed each of the students’ behavior guidelines so that the experimental sessions would be similar to work sessions that occurred throughout the school day. In addition, participants would engage in the leisure item for the same amount of time as they would normally during the school day.

Jack’s work activities were social question (e.g., “how old are you?”), “what is your name”?) and counting up to five (e.g., count to one, count to four). Watching a movie and playing with toy animals were the leisure activities for the assessment. During the work activities Jack would earn token for each correct respond. For the leisure activities Jack would have three minutes and then ask for an additional minute.

For Anne the two work activities chosen were matching picture to picture and zipping. For matching the researcher would present a picture as a sample and then three comparison pictures. Upon being presented with the comparison Anne would retrieve the correct comparison picture and put it beside the sample picture. For each correct response Anne would receive a penny and for ten pennies she was able to exchange for an edible. Each session of matching to sample consisted of nine trials. When running the zipping activity Anne would put on a vest and upon hearing the researcher say “zip up” she would start zipping up the vest. The experimenter followed an eight step task analysis in which Anne would earn a token for the training step. Each trial was run three times and for three tokens she could exchange for an edible. For the leisure items the researcher choose watching a video and reading a book. Anne engaged with the leisure items for three minutes and at the end of those three minutes she could ask for an additional minute by exchanging a picture.
David’s work activities were tying his shoe and telling time. When running the tying shoe program the researcher followed a 6 step task analysis where David was manually guided through untrained steps. For telling time David was working on whole hours (e.g., ten o’clock, twelve o’clock) which he was able to identify independently. David would earn a token for every other response and could exchange the tokens for an edible after earning five tokens. Leisure activities were playing on a carpet with toys and playing on the computer. David had three minutes plus one if he requested more time.

Cutting paper with scissors and identification of objects (cup, spoon and book) were the two work activities chosen for Jon. For the cutting program Jon would cut with scissors through a line that was drawn on a piece of paper. Jon was provided with full manual guidance when cutting. Each session consisted of five trials. When identifying objects the researcher would put cup, spoon and book in front of Jon, next the researcher would say the name of the target object and simultaneously sign the object. The experimenter manually guided Jon to point to the right object. The position of the target object varied throughout the sessions. Jon received a token for each response and after five tokens he could exchange them for an edible. Watching a movie and playing with moon sand were the leisure activities with which Jon engaged.

Work activities selected for Peter were addition and telling time. For addition the experimenter would give Peter a piece of paper with five addition problems. Peter would solve the problems with a pencil and give to the teacher after completion. For telling time the experimenter would hold up a clock and ask Peter “what time is it”? Peter was being trained on half hour time telling and earned a penny for each correct response. When he had earned nine pennies he could exchange them for an edible of his own choice. For leisure activities the experimenter selected drawing and taking a ride in the elevator. Peter could spend three minutes
with his leisure activities and get an extra minute if he requested.

The two work activities chosen for Sven were telling time and labeling coins. For telling time the researcher would hold up an analogue clock and ask what time it was. Sven was being trained on half-hour time telling. The prompts used for that program were full verbal model with a 2 s delay. For example the experimenter would ask Sven “what time is it?” while holding up an analogue clock, wait for a response for 2 s and if no response would occur the experimenter would say “five thirty” and Sven would repeat. For labeling coins the experimenter would vary between the questions “what is it” and also “how much is X worth”. For example if the experimenter would hold up a penny he would say “how much is a penny worth?”. Sven would earn a token for each response which after 15 tokens he could exchange for an edible. The two leisure items that were chosen for Sven were playing on the computer and watching television. Sven would engage with the leisure items for five minutes and could ask for an additional one more minute.

**Response measurement**

The dependent measure was the participant selection. This was defined as the participant pointing with an isolated finger to either of the stimuli presented.

**Reliability**

The experimenter collected data on which activity the participant choose. Interobserver agreement data was collected during 33% of sessions. Agreement was recorded if both observers recorded the same item chosen in each choice trial. Agreement was 100% for all the participants.
Results

Figure 2 illustrates the results obtained from the preference assessment. Percentages are based on the number of times an activity was chosen out of the number of times it was presented. For all the participants the activities chosen as high preferred were in fact more preferred than those that had been identified as low preferred. Although moon-sand and cutting were chosen equally for Jon, when summed together, the two leisure activities were more preferred than the work activities.

Discussion

The present study demonstrated a different way to assess problem behavior and transitions. Descriptive assessment was conducted to evaluate problem behavior in different transition types. Transitions were defined as going from one activity to another and activities were divided into high and low preferred. A preference assessment later verified those activities were in fact high- or low preferred. Four types of transitions were analyzed from the descriptive assessment; going from a low preferred activity to a high preferred activity, from low preferred activity to a low preferred activity, from high preferred activity to low preferred activity and from high preferred activity to a high preferred activity.

If we conceptualize going from a rich to lean reinforcement as going from high preferred activities to low preferred activities the results are consistent with what basic research has found. The longest pausing occurred on a schedule from a rich to lean reinforcement (Perone & Courtney, 1992; Bejarano, Williams & Perone, 2003). For five out of six participants problem behavior occurred in highest proportion of transitions from high preferred to low preferred activities. When analyzing activities with problem behavior all participants except one engaged in problem behavior in higher proportion of low preferred activities then in the high preferred
activities. For that participant, CC, when engaging in the high preferred activity he would start whining when the teacher could not start the video he was watching on a specific location.

In addition these results confirm what basic studies have shown (Perone & Courtney, 1992) that it is the context of the activity not the activity itself that determines if the activity is aversive. In the current study Jack, Jon, Peter and Sven did not engage in problem behavior leaving low preferred activity to another low preferred activity. But when leaving high preferred activity and going to a low preferred activity problem behavior occurred in the highest proportion of that transition type. Additional interpretation could be noted from participants’ individual differences. Anne and David had problem behavior occur in higher proportion of transitions from low preferred activity to another low preferred activity. These results suggest that each individual is sensitive to certain types of transitions. For some children it might be aversive to go to a low preferred activity regardless of what the previous activity was. Other students, like Jack, might have problems in leaving high preferred activities, regardless what activity is next. For these students it might be interesting to conduct a functional analysis to confirm that their problem behavior is maintained by escape from demands (Anne and David) or access to tangibles. The results also demonstrate that the predictability of an upcoming activity is not always a plausible treatment for problem behavior in transitions. In the present study all of the transitions were signaled and as in the basic literature when signaling transitions the probability of problem behavior in certain transition types increases.

The current study extends previous research on problem behavior and transitions in several ways. First, although research has been conducted on transitions and problem behavior no study has considered the interaction between different activities in natural settings. Previous studies have examined transition as a change to an activity or from an activity, for example
initiating a work activity or ending a leisure activity, but they have not examined the interaction between two activities. For treatment purposes it might be relevant to assess if interaction between activities are relevant to problem behavior and transitions. Also for clinicians this type of an assessment might be useful when developing a program for children with disabilities. A common daily schedule for children is changing from a high preferred activity to a low preferred activity (e.g., trade in to work) but for some students that transition type might cause additional problems. Second the results demonstrate the similarity between pausing with laboratory animals and problem behavior with humans in the natural environment. This study contributes to the translational research in behavior analysis were basic behavior principles were applied to an applied settings.

Several limitations should also be noted. First because experimental analysis was not conducted it is not possible to determine the function of the problem behavior during specific transition types. By experimentally manipulating specific transition types it would be possible to verify the results from the descriptive assessment. Second, because IOA was only collected for four of the participants it is possible that in spite of definition of the variables, the individuals could have collected the data differently, which is a threat to the accuracy and reliability of the data collection. Last, the experimenters conceptualized the work and leisure activities as low and high preferred without doing an assessment. Although the preference assessment was conducted after the analysis it might have been better to assess them before the descriptive assessment.

To verify further the results and practice of the descriptive assessment it would be interesting to include the activities assessed as low – and high preferred in an experimental analysis on transition types and problem behavior.

Individuals with and without special needs encounter transitions between different
activities frequently every day. Because transitions from different activities are reported to cause problem for children with autism further research on using an analysis which takes into account the interaction between those activities is needed.
References


<table>
<thead>
<tr>
<th>Participant</th>
<th>Low %</th>
<th>High %</th>
</tr>
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<tbody>
<tr>
<td>Anne</td>
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<td>10</td>
</tr>
<tr>
<td>Sven</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>David</td>
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</tr>
<tr>
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<td>20</td>
</tr>
<tr>
<td>Peter</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 1. Percent of problem behavior during engagement with low and high preferred activities.
Figure Caption

Figure 1. Proportion of transitions with problem behavior.

Figure 2. Percentage of times activity was chosen in a preference assessment.