

Increasing On-Task Behavior in a Developmentally Delayed Preschooler Using a Picture Activity Schedule

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Autism is at the forefront of research in early childhood education. The CDC reports a prevalence rate of 1 in 88 children having an Autism Spectrum Disorder (CDC, 2012). For children with autism, school can be a scary and stressful place. Classrooms are loud, bright, and chaotic. They also consist of one transition after another. Transitioning is often difficult for children with autism. This difficulty can lead to feeling withdrawn from the social environment of the classroom. One way teachers in early childhood special education have helped children with autism navigate classroom activities is through the use of activity picture schedules. A large body of research has been conducted specifically on how educators can help children with autism access educational curriculums in their own, productive way. An article by Banda, Grimmert and Hart (2009) raised the important point that children with autism “respond to visual input as their primary source of information” (p.17). With this in mind, picture activity schedules have been one intervention that has evidence of success in sequencing a student’s day in a way that is easily accessible to the child and has also been found to increase on-task behavior (Banda, Grimmert & Hart, 2009).

A literature review by Banda and Grimmert (2008) adds to the growing amount of research documenting the positive effects activity schedules have in enhancing social and transition behaviors for individuals with autism. In a review of thirteen studies with a total of thirty-one participants, activity schedules were found to be effective across all participants. Results from across the studies reported an increase in on-task and transition behavior, as well as an increase in social exchanges and self-determination (Banda & Grimmert, 2008). The activity schedules used in these studies all contained visual supports that were placed in a folder or album. The authors of this literature review explained that perhaps one reason for the effectiveness of this intervention was that the activity schedules served as a discriminative stimulus for initiating the next behavior in the activity and gave the student adequate warning for what came next.

O’Reilly, Sigafoos, Lancioni, Edrisinha & Andrews (2005) demonstrated evidence that a functional analysis could be an important tool when developing an activity schedule. A functional analysis was used to determine during what parts of the school day an activity schedule would be beneficial for a twelve-year-old boy with autism. The goal of the intervention was to increase levels of engagement and decrease self-injurious behavior. The functional analysis concluded that a schedule of demand followed by no interaction, play, and then demand was the most successful in reducing self-injurious behavior. The intervention used an ABAB design with no schedule as the baseline and the use of a schedule throughout the experimental stages. The activity schedule was successful in reducing challenging behavior and increasing engagement for this particular student (O’Reilly, Sigafoos, Lancioni, Edrisinha & Andrews, 2005).

In a study by Spriggs, Gast, and Ayres (2007), four students with moderate intellectual disabilities with high rates of off-task behavior were observed using picture activity

schedule books in a self contained classroom. The purpose of this study was to increase on-schedule and on-task behaviors during an independent work time in the classroom. This particular study used an ABCBAB design. The students were able to learn how to appropriately use the picture schedules and teacher prompts were faded. The student's on-task and on-schedule behaviors increased only in the conditions where the picture schedule books were used. Students were also able to generalize the use of the picture schedules to other parts of the day (Sprigg et al., 2007).

Most of the current research on the use of activity schedules consists of single subject designs that are not as practical for students in an inclusion setting, where the one-to-one ratio of students to teachers is not always possible. Betz, Higbee, and Reagon (2008) conducted a study that added a social element to the use of activity schedules. The participants in the study were two preschoolers in an inclusive setting who used an activity schedule working together. Each student got the chance to pick one activity and then put the picture on the activity schedule. They then followed the schedule and completed the activities together. The study consisted of baseline, teaching, maintenance, re-sequencing and generalization phases. A 20-second momentary time sampling measurement system was used. Results indicated that using this strategy peer engagement increased without prompting (Betz, Higbee, & Reagon, 2008). This article is of particular interest because positive reinforcements were not used at the completion of the schedule. It is interesting to think that children with autism, who are generally perceived to lack social skills, could be so motivated by doing activities together that they would not need reinforcement.

In the present study, a functional behavior analysis indicated that off-task behavior in a four-year-old boy with developmental delay might be maintained by the lack of structure in parts of his school day. Based on these results, a differential reinforcement of incompatible behavior (DRI) intervention, using a picture schedule during unstructured parts of the day, was implemented and its effectiveness was observed. It was hypothesized that off-task behaviors would decrease and on-task behaviors would increase when the picture activity schedule was used. This includes increasing the time the student can attend to an activity during his center time without getting up and wandering around.

Method

Participant and Setting

Jerry is a four-year-old who currently attends a small public charter preschool in Northwest D.C. Jerry has been diagnosed as Developmentally Delayed and currently has an IEP that addresses difficulties in language, sensory and academic areas. This is Jerry's second year at this school where he is taught in an inclusive classroom. The class is made up of eighteen students and five teachers. The teachers in the classroom have different roles but have a common purpose of supporting all of the diverse learners in the classroom. There is a special education teacher, a lead teacher, a teaching fellow, an assistant teacher and a one-to-one paraprofessional who works specifically with Jerry in the classroom. An outside observer coming into this setting would be able to quickly realize that Jerry has difficulty with body control and sensory integration in the classroom. The paraprofessional who is designated for Jerry supports him in participating in the daily routine and classroom activities.

Materials

A picture activity schedule was used for this intervention. The schedule consisted of a laminated tan folder with Velcro pictures of the seven centers in the classroom on the front. On the inside was space for three pictures with the numbers 1-3 next to it. On the back of the folder was space for the three tokens Jerry could earn and a picture of the reinforcer, which was "Thomas the Tank Engine."

A visual timer was also used. It had a clock face and as time passed the red space representing minutes would become smaller, representing time passing.

Target Behavior

The behavior Jerry worked on was increasing on-task behavior during his center time. On-task behavior was defined as looking at the current activity with his eyes, using materials appropriately, keeping his hands to himself and following the teacher's directions. Center time is a free choice activity time for students lasting approximately sixty minutes each day. In Jerry's classroom, there are seven different centers available for the children to play in and explore, all relating in some way to the current unit of study.

During the baseline and intervention phases, data were collected using time sampling for twenty minutes each day during Jerry's center time. The time intervals lasted one minute. At the end of each interval the observer recorded whether or not Jerry was on-task.

Research Design

A single-subject AB design was implemented to determine the effects of the intervention for Jerry. An AB single-subject design was chosen because the intervention was conducted in a classroom setting and the researcher did not think it was appropriate to take away the intervention and return to baseline. A withdrawal design was not recommended for concern that the inappropriate behaviors displayed by the student would increase to disruptive levels.

Assessment Procedures

A functional behavior assessment (FBA) was conducted to identify the main setting events, antecedents and consequences for Jerry's behavior. The FBA consisted of interviewing Jerry's teachers and conducting direct observations of Jerry throughout his school day.

Intervention Procedures

These behavioral objectives were achieved through a differential reinforcement of incompatible behavior procedure (DRI) paired with the use of an activity picture schedule and token board. At the beginning of center time Jerry was taken into a quiet corner with a teacher and choose the three centers he was going to begin with for the day.

Photographs of the classroom centers were on the front of his activity schedule. He then placed the three pictures next to the numbers 1-3 on the other side of his activity schedule. The other students in the class used a card system where they wait for their name to be called, and then walk up to the centers chart and make a choice in front of their peers of what center they will choose first. This proved challenging for Jerry because he often displayed inappropriate behavior, as defined above, when the attention of his teachers and peers was solely on him. Planning with a teacher in a quiet spot in the classroom proved beneficial for Jerry.

With the help of a teacher, Jerry placed the photographs on the activity schedule board. He would then proceed to the first center where a teacher set a visual timer for seven

minutes. The visual timer is an effective way of showing Jerry when a transition is approaching. His teachers would call attention to the timer throughout his time at a center. When the time was up, if Jerry had been on-task for a majority of the one-minute intervals during that center, he was given a piece of a railroad track to put on the back of his schedule and then moved onto the next center. Seven minutes was chosen as the time interval for each center because Jerry's teachers felt, from previous observations, that this was an appropriate amount of time he was able to attend. Therefore, if Jerry was on-task for four out of the seven minutes in a particular center, he received a railroad track piece. If he was not on-task, no piece of the train track was given and Jerry was asked to move onto his next center.

Throughout this time his teacher gave verbal praise for on-task behavior. The teacher working with Jerry also gave suggestions every other minute of appropriate language to use with the other children at the center. Phrases such as "want to play" and "can I have a turn," were verbally prompted by a teacher. Verbal praise was also given to Jerry when he used such statements successfully with his peers. If Jerry was off-task for more than two minutes, a teacher redirected him and helped him become engaged again in the activity through physical and verbal prompting.

The railroad theme was chosen because it is very motivating for Jerry and was a topic the student talked about frequently. After Jerry completed his third center, if he earned three pieces of his railroad track, he was allowed to watch five minutes of a "Thomas the Tank Engine" video with a teacher. If he did not receive the three pieces he took a sensory break that a teacher choose and then returned to the classroom for the remainder of center time.

Results

Assessment Results

A functional behavior analysis revealed insightful information into Jerry's behaviors. Jerry's difficulty with modulating his level of arousal and his sensory defensiveness, as termed by an occupational therapist, impede his ability to participate appropriately during many parts of the school day including center time and other free choice activities. This manifests itself in touching other students, running around the classroom, and what appeared to be attention seeking behaviors.

When Jerry is playing at a center, he demonstrates off task behaviors in the form of inappropriate language and misuse of classroom materials to gain attention from peers and teachers. Jerry's off-task behaviors most often looked like inappropriate language, yelling out, running from teachers, and aggressiveness. The problems occurred throughout the day, most often during unstructured times of the day. If the behavior was not redirected it could last long amounts of time. The behaviors were both disruptive and dangerous and occurred with all staff members. It was decided that there was a sensory link to the function of the behavior, which caused him to have attention seeking behaviors. The FBA revealed that the negative behaviors occurred most frequently when Jerry experienced sensory overload during unstructured parts of the day such as center time, and he was unable to monitor it. In addition, when Jerry did not understand what was being taught during whole group time on the carpet, he would occupy himself by trying to get the attention of others.

Intervention Results

Six sessions of baseline data were collected. During baseline, rates of off-task behavior

ranged from 45% to 65% of the intervals observed. Jerry was off-task for a mean of 9.7 out of the 20 one-minute time intervals in which data were collected. In other words, Jerry was off-task for 49% percent of the time intervals. Data were collected for eleven days of the intervention stage. Rates of off-task behavior during the intervention ranged from 10% to 30% of the observed intervals. During the intervention stage, Jerry was off-task for a mean of 4.1 out of the 20 one-minute intervals or 20% of the intervals. The highest rate of off-task behavior occurred on the last day of baseline (Session 6) where Jerry was off-task for 65% of the time intervals observed. The lowest rate of off-task behavior occurred during the eighth and ninth sessions of the intervention stage. On this day, Jerry was off-task for only 5% of the time intervals. The days in which data were collected spanned over a month and a half. Due to outside factors such as absences, therapy sessions and field trips, the days in which data were collected did not follow one another consecutively. Despite these factors, Jerry's off-task behavior decreased from baseline to intervention and in turn, his on-task behavior increased as well.

Discussion

The results of this intervention supported previous research on the effectiveness of using picture schedules for students with autism to help increase on-task and appropriate classroom behavior. In this study, a DRI was used to decrease off-task behavior and increase on-task behavior for a four-year-old boy with developmental delay. There was an immediate increase in on-task behavior from baseline to the intervention stage. If a similar intervention was to be done to target the same behavior with this student, it may be beneficial for the positive reinforcements to occur immediately after each center, instead of waiting until all three centers were completed. The railroad tokens themselves were not as motivating as actually watching the video. One concern of the researcher was that the participant was not associating the on-task behavior from the beginning of the center time with the reward at the end. If the student was off-task for some of the intervals in the last center he still earned the reward if he had done well in the previous centers.

By studying the effects of the intervention, the researcher became aware of the aspects of the classroom and centers that made it challenging for Jerry to stay on-task. Due to his sensory processing difficulties, centers such as the block area and the dramatic play, made it very hard for Jerry to concentrate in and stay on-task. He was more successful in quieter centers such as the library and the art studio. When Jerry was working with his one-on-one paraprofessional he was able to stay on-task for a longer amount of time, than if he was with the researcher alone. It is also interesting to note that Jerry worked well with certain students versus others. Before starting the intervention it would have been beneficial to record how long exactly Jerry spent at each center. It would also have been insightful to let Jerry go through centers for a period of time by himself. He is rarely without a teacher by his side for safety reasons, but stepping back and observing how he interacts with peers alone would have been interesting.

The success of this intervention is proof that the strategy of using a picture schedule during more unstructured parts of the day can be beneficial for students who need more guidance and structure. The schedule was easy to implement and inexpensive to make and could be helpful for a number of students with similar difficulties. This is an intervention that could be used across classes and age levels. It is important to keep in

mind that the reinforcement plans must be concise and immediate, contingent on the appropriate behaviors. In the future it would be interesting to have students team up and use a schedule together. In an inclusive classroom such as Jerry's, this could be an appealing strategy. Having Jerry and a peer work together to decide what centers they will visit and then do so together could help Jerry work on appropriate social skills as well as staying on-task. Overall, picture schedules can help students with sensory and attention difficulties navigate successfully through the school day.

References

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Apendix A
Data Collection Sheet

JS--> On task Behavior	Time Interval =1 Mintue	20 minute observation
Time Intervals	Yes =	No = X
12:25		
12:26		
12:27		
12:28		
12:29		
12:30		
12:31		
12:32		
12:33		
12:34		
12:35		
12:36		
12:37		
12:38		
12:39		
12:40		
12:41		
12:42		
12:43		
12:44		
12:45		

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