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The Effects of a Package Treatment: Picture Activity Schedule and Functional Communication Training

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### Abstract

The purpose of this study is to investigate the effects a package treatment containing a picture activity schedule and functional communication training on the reduction of problem behaviors on a child with developmental delays. The study was conducted by first establishing discrimination between pictures, to be used in the picture activity schedule. Then the tutors progressively advanced through the six phases of the picture activity schedule. Each phase taught fundamental rules such as “first this, then that”, and built the schedule to more complex structure. In this way, the student could anticipate upcoming tasks, and preferred activities. The predictor strategy provides practical advantages such as increasing the individual’s autonomy, decreasing problem behaviors by means of altering the perspective of the aversive tasks by incorporating the reinforcing properties of choice, increasing motivation to work through tasks by provided clearly identified incentives. The combination approach to this treatment package incorporated intervention tools already built into the child’s working environment such as the picture exchange communication system (PECS) and token economy. These tools aided in establishing a more elaborate means of communicating expectations between the educator and student.

Picture Activity Schedule, Functional Communication Training, PECS, Problem behaviors

## The Effects of a Package Treatment: Picture Activity Schedule and Functional Communication Training

Young children in early education special education struggle with autonomy in various ways. One of the challenges facing this population is the ability to complete a variety of tasks that may be interpreted by the child as aversive due to their low preference. Previous observations and studies have concluded that these children may benefit from the opportunity to make more choices in their daily environments.

Many studies have been conducted on children with learning disabilities, incorporating a picture activity schedule, and proven successful at reducing problem behavior. The usage of picture activity schedules has been reported in numerous cases to help students independently transition from one activity to another. The visual prompts provided in the activity schedule “provide a structured teaching environment, make expectations clear, and lessen the need for continuous adult prompting” (Bryan & Gast (2000) p. 554). Another study, demonstrated a drastic reduction in problem behaviors simply by the presentation of choice between both tasks and reinforcers. According to this study, “higher levels of task engagement and lower levels of disruptive behavior were associated with the choice relative to the no-choice condition” (Fisher, Thompson, Piazza, Crosland, & Gotjen, 1997, p. 424). Hence the incorporation of choice is significant as it is a method proven to promote individual autonomy and reduce inappropriate behaviors.

Currently the student has a choice of toys and leisure activities that are used as reinforcers for task completion. Dyer’s study discovered that the opportunity to choose tasks as well as reinforcers may be considered a reinforcer in its own right (Dyer, Dunlap, & Winterling (1990) p. 523). This intervention will mostly focus on the effect of choice on task order.

Additionally, the student will be presented with a schedule that will depict activities to be completed throughout the school day. This schedule should aid the child in understanding what is to be expected of him to do in his upcoming activities. The goal of this design is to reduce assumed escape-maintained problem behaviors and increase on-task compliance.

This intervention also allows for an opportunity to teach rule following. The child can learn the expectations for a given task and the associated earned reinforcer upon task completion. This is accomplished by establishing the rule “first ‘this’, then ‘that’”. The idea of rules is a practical skill set useful in many environments and situations. For instance, the parents of the child may state the rule “first brush your teeth, then you can listen to a bedtime story”. In this example, the child is motivated to work through the potentially perceived aversive task of teeth brushing in order to earn the preferred activity of hearing a bedtime story.

By consequating the completion of an aversive task with a preferred activity, the child’s motivation to work through the task is elevated. When motivation to earn a preferred activity is heightened, the likelihood of the child engaging in disruptive problem behaviors is inversely decreased. Therefore, the rule allows the child to complete self-care tasks, increasing autonomy, and alleviates the care giver from troublesome and problematic behaviors that previously may have interfered with daily living skills.

This research is beneficial because many educators struggle to create conducive learning environments for children with developmental or communication delays due to detrimental problem behaviors. By reducing those problem behaviors, educators can increase productivity in learning, and subsequently strengthen the individuals’ autonomy.

Based on prior studies concluding that picture activity schedules are proven to reduce problem behavior, the experimenters expected a drastic decrease in problem behavior, and a

reciprocal, noticeable increase in on-task compliance. The student will have the opportunity to choose the most preferred tasks in the order of preference, and engage in appropriate reinforcing activities. The combination approach of highlighting expectations and empowering the student with the option of task scheduling should induce positive effects for the student, family, and educators. Additionally, this approach will prepare the student for a transition from a one-on-one setting, to a group skills environment.

The purpose of this intervention is to examine the effects of a picture activity schedule on the frequency of problem behavior (escape maintained) for children in an early childhood special education preschool. This intervention is particularly relevant to the field of applied behavior analysis. By decreasing problem behaviors and conversely increasing appropriate behaviors (i.e. independent skills) one empowers the student to make choices; which will increase autonomy; thus allowing the student to have a little bit more control over their environment than would normally be available without this kind of an intervention.

## **Method**

### **Participants**

The intervention was implemented on a 4 year old male student currently enrolled in an early special education program. The child was specifically chosen to participate in this study due to the strong prevalence of problem behaviors which historically has impeded his opportunities to learn in an educational setting. Such problem behaviors have been observed by tutors, and other staffed educators responsible for creating learning opportunities. As indicated by the observers, an intervention was necessary to increase skill acquisition.

This intervention necessitated that the child be fluent in PECS, and meeting mastery criteria for the discrimination phases. PECS fluency is crucial for this intervention because the picture activity schedule incorporates PECS icons to illustrate the upcoming activities.

Therefore, the participant was chosen also because he meets this requirement.

### **Settings and Materials**

The child's education setting was facilitated through WoodsEdge Learning Center. The child's working space was located in the middle of the classroom, at a horseshoe shaped classroom activity table. The table top surface is approximately 24 inches height. The diameter of the table is approximately 60 inches wide. The student and tutor sat on children chairs approximately 12 inches height. The student worked through procedures while seated at the table.

The materials manipulated during working time varied across procedures including letters (matching), pencils and paper (draw lines), various correspondence items (ID objects) and the PECS book.

The picture activity schedule materials included picture icons, representative of the numerous procedures and activities anticipated for the student to encounter throughout the class time. These icons were laminated pictures with approximate dimensions of 2.5" by 2.5", with small pieces of Velcro glued to the backing. These icons were to be affixed to the picture activity schedule; which is a plastic strip with a Velcro strip down the center.

**Independent Variable**

The independent variable in this study is a package treatment to include a picture activity schedule (PAC) and functional communication training (FCT).

**Dependent Variable**

The dependent variable is problem behaviors to include: flopping, eloping, biting, swiping materials, hitting, and spitting. The intervention aims to reduce the frequency of all problem behaviors and also reduce the duration of elopements.

**Example**

An example of flopping is any occurrence when the student thrusts his body from the chair or upright standing position onto the floor; where more than 50% of his body mass is in contact with the floor (outside the topographical form as required by a procedure such as “roll ball”).

Examples of elopements include any instance when the child makes an effort to flee from the tutor or working environment as in running away from the table.

An example of biting would entail the student opening his mouth, planting the open mouth on a bodily portion of the tutor and placing a substantial amount of force down on his mouth to inflict pain for the tutor.

An example of swiping materials would entail the student throwing any procedure materials away from the working station.

An example of hitting would be when the student thrusts his arms or legs in the tutor's direction with significant force, and the tutor is hit with the thrusting appendages.

An example of spitting includes any instance where the student holds a measurable amount of saliva within his mouth, and projects this saliva outward with force.

#### Non-Example

A non-example of flopping would include an instance where the child deliberately sits down in order to engage in a procedure such as "roll ball".

A non-example of elopement would include the act of running away from the tutor in the functional procedure "tag" as a means to evade being tagged "it".

A non-example of biting may take the form of the child opening his mouth, placing the open mouth on a body part of the tutor and blowing out to create a "raspberry".

A non-example of swiping materials might occur if the child accidentally knocks procedure materials off the table with his elbow, while attending to some other stimuli.

A non-example of hitting might take the form of the student reaching out in a stretch, and his appendage accidentally swipes the tutor in its course.

A non-example of spitting might look like drool culminating about the student's mouth while eating.

#### **Measurement**

During the baseline phase, ABC (antecedent-behavior-consequence) data was collected in order to best hypothesize the function of the problem behaviors. The observer recorded all

instances of problem behaviors and the corresponding stimuli that preceded and followed the problem behaviors. From this data, an intervention data log sheet was created itemizing the specific behaviors observed during baseline.

During the intervention phases, the observer tallied each occurrence of spitting, flopping, elopements, hitting, biting and swiping of materials. The start and stop time to define the duration of elopements was also recorded.

### **Procedure**

This experiment is a single subject research design (AB). The research design will only include baseline and intervention due to the severity of the problem behaviors. These behaviors inhibit the child from progressing toward independent learning as would be necessary within a “normal” classroom. Time is of utmost importance, and a reversal phase back to baseline would hinder the child’s progress toward the goal of enrollment into a normal classroom. Additionally, these problem behaviors are destructive, and a reversal design would not be beneficial to the student.

At baseline phase, only ABC data was collected.

The intervention began with a pairing procedure. The purpose of the pairing procedure was to create an association between the icons and their represented procedures and activities. This phase was broken down into two sub-phases. Phase 1, the tutor held the icon for the child to see, and gave the discriminative stimulus (Sd) “time for procedure”. Once the child looked at the icon, he earned one token on his token economy board. Phase 1a, the tutor held up the icon and gave the Sd “time for procedure”. The child was required to look at the icon and engage in one correct trial of represented procedure, and then he was granted one token.

Phase 1 of the Picture activity schedule, the tutor would hold up two icons, place the first one in front of the child and say “first procedure” then, show the second icon and say “then second procedure”. The child earned one token for attending to the icon and engaging in one correct trial for each icon presentation.

Phase 2, the schedule strip was introduced. The tutor would present two icons, and say “first procedure” then placing the icon on the strip, show the second icon and say “then second procedure” and place it below the first icon on the strip. The child earned one token for attending to the icon and engaging in one correct trial for each icon presentation. At the completion of each procedure, the tutor would prompt the student to remove the icon representative of the completed procedure and the next procedure would be added below the remaining procedure.

Phase 3, included three icons; the first icon was a procedure, the second icon to be an activity of high preference (such as play time on the castle), the third icon must be a transition back to the working table. The same Sd was provided for progressing to each subsequent icon on the schedule.

Phase 4 incorporated the student’s choice. The tutor would hold up two icons and prompt the student to choose one. The tutor would then indicate the chosen icon would be the first procedure on the schedule, the icon not chosen would follow in the schedule.

Phase 5 is the choice and contrived phase of the intervention. The tutor would again hold up two icons, and prompt the student to choose one. Once the student indicated his preference, the tutor would indicate the icon not chosen as the first procedure on the schedule; the chosen icon would be the second procedure on the schedule.

Phase 6 is left open for design. The classroom teacher is able to alter the design of the intervention to best suit any deficits noticed throughout the previous phases.

The second portion of the package treatment includes functional communication training (FCT). This portion included five phases. FCT involves the use of picture exchange communication system (PECS) icons. In this intervention the student was provided with five icons representing: please wait, break, snack, toys, and play with friends. The student could choose an icon and present to the tutor in order to engage in the represented activities for 15 seconds. This segment of the intervention was intended to teach appropriate ways of requesting a break (escape) from demands. Throughout subsequent phases the token economy was incorporated in order to increase the amount of working time between requests.

Phase 1, the child was allowed to openly mand (request) for these activities (no tokens were required)

Phase 2a, the child was required to have earned 1 token on his token economy board (from correct procedure trials) prior to manding with the FCT board.

Phase 2, the child was required to have earned 2 tokens on his token economy board (from correct procedure trials) prior to manding with the FCT board.

Phase 3, the child was required to have earned 5 tokens on his token economy board (from correct procedure trials) prior to manding with the FCT board.

Phase 4, the child was required to have earned 7 tokens on his token economy board (from correct procedure trials) prior to manding with the FCT board.

Phase 5, the child was required to have earned 10 tokens on his token economy board (from correct procedure trials) prior to manding with the FCT board.

### **Results**

The intent of implementing a picture activity schedule and functional communication training is to decrease the frequency and duration of problem behaviors. As subsequent phases progress, a downward trend is observed, especially noticeable during the functional communication training phases. At this point, conclusive correlations between the picture activity schedule and the student's behaviors cannot be determined. Throughout the implementation of the picture activity schedule, other interventions are concurrently implemented including response redirection intervention.

#### *Baseline*

Total duration of elopements totaled 36 minutes over a frequency of 28 occasions of elopements. The student also engaged in the following problem behaviors, with their corresponding frequencies: biting 3, swipe/throw materials 13, flopping 40, spitting 35, and 35 responses of hitting.

#### *Pairing Procedure*

The frequency of all problem behaviors did not reflect a significant change in frequency during the pairing procedure. This procedure is not intended to effect the problem behaviors as the point is only to establish attending to the icons, and build a foundation for the picture activity schedule implementation.

*Activity schedule: Phase 1-3*

During the Activity schedule implementation, an increase in frequency and duration of problem behaviors was observed. Presumably, this increase may be attributed to the initial phases did not require any independent behaviors from the student. One may hypothesize future phases (i.e. 4 and 5) could result in a decrease of all problem behaviors due to the application of student-based decision making for selecting which procedures to work on. Hence the student may perceive the procedures as more preferable, less aversive, and therefore engage more in on-task behavior. Conversely, more time spent working on-task; there will be less opportunity to engage in problem behaviors.

*Functional Communication Training*

Problem behaviors show a decrease during functional communication training phases. One may hypothesize the decrease as a result to the opportunities implicit within this training. The student is given opportunities to mand for numerous tasks, such as “break, please wait, snack, play with friends, and toys”. These options all may be considered as highly preferred activities. Therefore, the student is engaging in activities that are more reinforcing than problem behaviors. Also, the student may not engage in escape tactics from activities which are deemed reinforcing.

**Discussion**

Picture Activity Schedules are proven to be effective in reducing problem behaviors and increasing on-task compliance in children with autism or other developmental/communication delays. Implementing a concise schedule allows for differentiation of appropriate reaction; the student is given clear indication of what lies ahead. A predictor strategy is a good method to

allow the student to anticipate what is expected of him. In this way, both the student and tutor are in the know of what to expect throughout the schedule. Several studies investigate the effects of different Activity schedule designs in order to discern which component manipulations result in the most generalized reduction of problem behaviors.

According to O'Reilly (2005) by first conducting a functional analysis, the researchers were able to identify precisely which antecedents resulted in problem behaviors. This in-depth analysis allowed for an activity schedule to be designed child specific. The resulting data indicates that the intervention was a huge success. However, a major drawback for this study in relation to practical implementation is a lack of resources available to conduct a functional analysis for every child exhibiting problem behaviors.

The antecedent most often identified as the trigger for problem behaviors is the student's perception of the task as aversive. Therefore, the problem behaviors seem to act as a means of escaping the aversive tasks. Now that the motivation to escape aversive tasks is considered common knowledge, the teachers are left to design an intervention that somehow alters the perception of required tasks in the classroom setting. One such popular method of transforming previously aversive tasks into preferred tasks is through a choice mechanism.

Several studies focus on the reinforcing, thus motivating effects of choice. There has been established a direct relationship of implementing choice on the reduction of problem behaviors. When the student is allowed an option of which tasks to complete, the result is a transformation of perception for some tasks to be less aversive; therefore reducing the motivation to escape chosen tasks resulting in the subsequent problem behaviors.

Alas, one major drawback to allowing students free access to choosing task order falls to impracticality. In an individualized, one-on-one setting, this design proves to be beneficial. However, once the student is academically or socially ready to advance into group work, this simply will not work. All students in a group will likely disagree as to the order of tasks on a daily schedule. The child, whom is overruled, may attempt to escape the now perceived aversive tasks due to his lack of choice power.

Overall, a picture activity schedule is an excellent means to introduce a working schedule by which the student will be motivated to respond appropriately to the demands of each task. This introductory phase may need additional adjustments to aid in more practical applications as the student is ready to transition to a group setting.

For future research, I would like to see a more in-depth look into slightly more aversive tasks incorporated in the student's schedule. Most of the studies investigated on remedial demands such as identifying body parts. The environment at WoodsEdge, requires more effort for many of the curriculum procedures.

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Figure 1. – Graph depicting frequency of problem behaviors across procedure phases

