

IMPLEMENTATION OF ANTECEDENT INTERVENTIONS FOR YOUNG CHILDREN  
WITH AUSTISM  
WITH ESCAPE-MAINTAINED BEHAVIORS

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## **ABSTRACT**

Young children with autism spectrum disorder (ASD) who engage in elopement are at a greater risk for aberrant behaviors due to a reduced ability to practice social skills and engage in learning opportunities. Because of their difficulty in these areas, aberrant behaviors tend to increase, such as elopement, aggression, self-injury, or tantrum related behaviors. With this, interventions targeting early prosocial behavior, such as the use of classroom preventive practices, are crucial for young children with autism to guide them to independence, connect with those around them, and achieve positive life outcomes. The experimental design of this study was a nonconcurrent multiple baseline design with embedded withdrawal across three participants. The intervention implemented aimed to address escaped-maintained behaviors (i.e., elopement). Results of this study revealed that targeting a child's function of behavior increased prosocial behavior and decreased aberrant behavior for two young children.

*Keywords:* Communication, aberrant behavior, prosocial behavior, autism spectrum disorder, classroom

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## **INTRODUCTION**

Individuals with Autism Spectrum Disorder (ASD) face many challenges and delays in terms of social interactions, language, and communication (National Resource Council, 2001). Because some children with autism have limited speech and communication, they are at a significant risk for developing perceived challenging behavior if evidence-based interventions are not implemented (Frea et al., 2001; Wong et al., 2015). Children with autism often demonstrate increased rates of challenging behaviors that hinder their learning and educational experience such as leaving a designated area without permission (Olive et al., 2008; Stockall & Dennis, 2016). Despite serious concerns about a child's safety when elopement behaviors occur, almost half of caregivers with children with autism report that their child demonstrates elopement behaviors (Stockall & Dennis, 2016). Children who elope may suffer from long-term consequences as they are likely to miss instructional stimuli, and opportunities to practice valuable skills alongside their peers, which can overall result in being moved into more restrictive educational placements (Pennington et al., 2012).

### **Importance of Supporting Children with Autism in Natural Contexts**

The Individuals with Disabilities Education Improvement Act (IDEA) is a federal law that requires "each state that receives federal funds to have a corresponding law regarding, among other things, nondiscriminatory evaluation procedures" (Ashcroft et al., 2021). With this, a major principle of IDEA is the least restrictive environment which states that each child has the right to be educated, to the maximum extent appropriate, with nondisabled children (Ashcroft et al., 2021). To correspond with the nondiscriminatory evaluation procedures, instruction in the least restrictive environment may include inclusion with a general education classroom. Inclusion provides children with autism opportunities to interact with peers who do not have

disabilities which broadens their educational experiences beyond the limitations that may occur from knowledge, skills, and abilities from individual instruction (DEC/NAEYC, 2009).

With inclusive practices, children learn to work with peers, follow routines, and develop skills that are beneficial to integrating them into the least restrictive settings. While the least restrictive environment aims to maximize positive outcomes for young children, it also requires advancements in intervention supports to ensure that children with disabilities have sufficient opportunities for learning and engagement.

### **Antecedent Interventions**

To address the repertoire of behaviors that children with autism may demonstrate in natural settings, teachers may implement antecedent-based interventions that prevent perceived challenging behaviors from occurring (Alberto & Troutman, 2022; Bambara & Kern, 2021). Use of antecedent-based procedures include manipulating environmental events to increase the likelihood that a learner would engage in improved behavior. Procedures are usually implemented in immediate context prior to occurrence of the target behavior (Cooper et al., 2020). Manipulations can be made to the classroom environment to reduce the frequency in which challenging behaviors occur (Fox et al., 2003). For example, providing children with choices, teaching routines and expectations, creating well-organized learning centers, or eliminating wide-open spaces. Interventions implemented within a Multi-tiered System of Support (MTSS), such as Positive Behavior Support (PBS), provide specific guidance for identifying antecedent interventions, such as examining environmental events, identifying specific triggers to problem behavior, learning about the purpose of problem behavior, developing support strategies for preventing problem behavior, and teaching new skills (Fox et al., 2003). Decades of research have shown the effectiveness of using strategies within this

framework to address perceived challenging behaviors (c.f., Horner & Sugai, 2020; Fox et al., 2003; Fox et al., 2002). Some outcomes of antecedent interventions used within a PBS framework include the development of social and communication skills, enhanced relationships with peers and adults, and an overall improved quality of life (Fox et al., 2003).

## **Literature Review**

For this literature review, studies that implemented antecedent intervention with young children (i.e., ages 2-5 years) with disabilities in classroom settings to increase prosocial behaviors and decreased aberrant behaviors were reviewed. Several studies have demonstrated positive outcomes for antecedent interventions to support prosocial behaviors in children with autism in classroom settings (c.f., Boyle et al., 2022; Pennington et al., 2012; Cote et al., 2005; O'Reilly et al., 2012), including sensory integration-based interventions (Pokorski et al., 2019). In one study, researchers found that implementation of preventative practices, such as functional communication training, extinction, and response blocking led to decreased perceived challenging behaviors (Boyle et al., 2022). In a separate study, researchers found that implementation of preventative practices, such as a warning transition and access to a tangible led to increase in young children's prosocial behaviors (Cote et al., 2005).

For example, Boyle et al. (2022) found that functional communication training (FCT) was the most common treatment for elopement but was always combined with another treatment component, most often extinction (withholding the functional reinforcer contingent on elopement) or response blocking (physically interrupting the response to prevent it from occurring). More specifically, in naturalistic settings, such as schools, reinforcement-based procedures (including FCT, differential reinforcement of alternative behavior [DRA], and noncontingent reinforcement [NCR]) were also combined with other treatment components,

including extinction and negative punishment (Gibson et al., 2010; Lill et al., 2022). Boyle et al., 2022 went on to say that regardless of function, using extinction to target elopement may be difficult because it can be hard to block access to an item before the individual obtains it, it can be unsafe to allow the individual to engage in the elopement behavior, and impractical to keep demands in place by transporting instructional materials. Boyle et al (2022) tried to extend on the research of elopement without using extinction or response blocking procedures in a naturalistic setting. This study included a tangible, escape, ignore, and attention phase combined with functional communication training. Here, elopement was decreased with the addition of FCT and without any additional treatment components for one function, access to tangibles; however, an additional treatment component was added for another function, automatic, specifically response blocking. Results indicate the benefit of antecedent interventions to address escape-maintained behaviors. A commonality between Boyle et al. (2022) and the current study is the implementation of a preventative practice, with a specific focus of function of behavior regarding elopement.

Another study evaluated the effect of differential reinforcement on elopement behaviors in a naturalistic school setting (Pennington et al., 2012). Because the participant's function of behavior was attention, his teacher provided praise on a variable interval schedule for appropriate behavior, such as sitting on carpet, looking, and pointing. Attention was withheld for problem behaviors. When the participant's teacher provided verbal attention contingent on his appropriate behavior, his elopement behavior decreased by 72% from baseline. When the verbal attention contingent on appropriate behavior was withdrawn, his elopement increased again. This study demonstrated how differential reinforcement, an antecedent intervention, could be applied into public school contexts to decrease elopement while focusing on the function of behavior.

Similarly, to the current study, Pennington et al. (2012) implemented a preventative practice, with a specific focus of function of behavior regarding elopement, such as differential reinforcement.

Another study by Cote et al. (2005) used two different antecedent strategies to increase compliance during activity transitions, such as a warning condition in which the children were given a two-minute warning before the transition began, and a condition in which the children were allowed a toy during the transition. Noncompliance was described as occurrences of problem behavior, such as hitting, kicking, biting, scratching, pushing, crying, screaming, whining, or dropping to the floor. Here, three typically developing children were included as participants. The effects of the two antecedent strategies were compared and deemed ineffective when implemented individually; however, when the strategies were combined with extinction, the children's compliance was observed to improve. The results of the study indicated that their compliance decreased with a return to baseline and increased again when one of the intervention conditions was reintroduced. Although neurotypical children were used for the study by Cote et al. (2005), their study results highlight the importance of preventative practices for young children within a naturalistic setting to decrease aberrant behaviors.

Lastly, O'Reilly et al. (2012) aimed to examine the influence of an antecedent intervention using communication to decrease challenging behavior of three children with developmental disorders. These children were taught to request tangible items, specifically reinforcers, identified in a prior functional analysis. A multi-element and reversal design were used to compare the antecedent intervention and no antecedent intervention for communication. Once the antecedent intervention was introduced, a tangible condition of the functional analysis was immediately introduced. Results showed that the antecedent intervention, specifically in the

subsequent tangible condition, reduced challenging behavior in all three children. Again, evidence for the effectiveness of preventative practices to decrease perceived challenging behaviors of young children in naturalistic settings is demonstrated. Across all studies, results demonstrate that antecedent interventions are particularly helpful for young children in naturalistic settings, particularly for children with disabilities.

### **Limitations & Future Research**

While elopement and wandering are common and serious problems for children with autism, scant literature exists on antecedent interventions that address elopement behaviors in young children with autism and few treatments have shown to be effective, particularly for classroom-based contexts (Stockall & Dennis, 2016). Limitations exist across the study literature which include few participants (Boyle et al., 2022) which makes it difficult to generalize study results to other children. In fact, researchers are unable to evaluate and generalize the treatment results with participants of similar or dissimilar profiles with few participants. Another limitation across studies is a lack of systematic procedures to identify variables that maintain target behaviors (Cote et al., 2005). It is unknown whether the target behaviors were maintained by access to the play area or escape from the toileting routine. A third limitation of the literature is that elopement behaviors did not fully return to baseline levels which may be an indication of child maturation (Pennington et al., 2012). An implication for future research would be to increase repetition of study results across participants to assess generality of effective treatments on specific child characteristics and increase the rigor of experimental design to control for the threats to history, such as maturation.

## **Purpose of Study**

Given the limitations provided in studies regarding generalization, lack of rigor design, and evaluation of students with similar or dissimilar profiles, the purpose of this current study was to extend and examine the impact of antecedent interventions to increase prosocial behaviors and decrease aberrant behaviors across participants in a natural context. Thus, the following research questions guided this study:

To what extent does the implementation of antecedent interventions to address escape-maintained behaviors of children with autism reduce aberrant behaviors?

To what extent does the implementation of antecedent interventions to address escape-maintained behaviors of children with autism increase prosocial behaviors?

## **METHOD**

### **Setting**

This research study occurred in a standard size public preschool classroom in an urban Midwestern City. The early childhood special education (ECSE) classroom was a half-day program with morning and afternoon sessions that occurred for three hours Monday through Thursday. Twelve children were enrolled in the morning session and 11 children enrolled in the afternoon session for about 12 hours each week. Adults in the classroom included a lead teacher, an assistant teacher, an assistant behavior analyst, and a behavior technician. The classroom contained spaces for shared center activities (e.g., house, block, and play areas) and access to an instructional setting where children engaged in activities such as puzzles, painting, and coloring. Child-size furniture was used in the classroom, such as chairs, desks, carpeted and tiled areas, including a designated space for children to store their belongings. All observations, including intervention, occurred during morning group instruction in the target classroom.

### **Inclusion Criteria**

Child participants were eligible for the study if they met the following criteria: 1) had a medical or educational diagnosis of Autism Spectrum Disorder (ASD) or Early Childhood Developmental Delay (ECDD); 2) exhibited high rates (more than three times within a 15-minute period) of elopement at morning group; 3) displayed low rates of prosocial communication (three or less attempts to initiate communication within a 15-minute period) during a target activity; and 4) were referred by the lead classroom teacher for intervention services. No participant inclusion criteria was established for classroom teachers.

## Recruitment

Participants were recruited from an early childhood special education classroom (ECSE) housed in an urban public elementary school. After Institutional Review Board (IRB) approval, consent forms were sent home to each child upon their enrollment in the classroom. Once consent was provided from their caregivers, target participants were selected to participate in the study who met the inclusion criteria. Thus, three children between the ages of two and five participated in this study.

## Measures

Two measures were used to collect data on children's developmental outcomes, as well as their prosocial skills: 1) *The Abilities Index*; and 2) *Social Skills Improvement Rating Scale (SSIS)*. The *Abilities Index* (Simeonsson & Bailey, 1991) allows for teachers to provide a description of children's abilities across nine areas of functioning (e.g., hearing, behavior & social skills, intellectual functioning, limbs, intentional communication, tonicity, physical health, vision, and structural status). Teachers rated child participants on a scale from 1 (normal ability) to 6 (lack of ability) across each domain. *The Abilities Index* has high agreement among professionals (88% within 1 point) (Bailey et al., 1993) and weighted kappa coefficients for multiple raters are reported to range from 0.24 to 0.90 with a mean of 0.60 (Wesley et al., 2000). The *Social Skills Improvement Rating System* (SSIS; Gresham & Elliott, 2008) provides a descriptive assessment of child behavior across social, emotional, and behavioral development. The classroom teacher completed this measure for each target participant and evaluated them based on communication, cooperation, assertion, responsibility, empathy, engagement, self-control, as well as externalizing and internalizing behaviors, including bullying, hyperactivity,

and inattention. Internal consistency score reliability for social skills and problem behavior scales are in the high .80s. Test-retest reliability ranged from .68 to .86 with a median of .81.

### **Child Participants**

Mario was a four-year-old Caucasian male with an educational diagnosis of Specific Language Impairment (SLI) and medical diagnosis of autism. Mario received speech services from the speech pathologist at the school. He had been enrolled in the classroom for less than one year prior to the start of data collection. According to his teacher, her goal was for him to sit at morning group for at least three minutes with minimal prompting. Mario's strengths included following the classroom routine and playing independently during free play. Based on teacher report, his perceived challenging behaviors included eloping from the morning group, walking around the classroom during instructional time, and spitting. According to the results of the QABF, the function of elopement for Mario was primarily maintained by automatic sensory reinforcement and secondarily maintained by escape and attention. Based on the *Abilities Index* completed by his teacher, Mario was rated as a four for having a "moderate disability" and engaging in "moderately inappropriate behaviors" for behavior and social skills. In addition, he was rated as a four for "moderate disability" for intellectual functioning and a four for "moderate disability" for intentional communication. For the SSIS, teachers reported his pre-test data as in the <1 percentile for social skills and in the 65th percentile for problem behavior.

Declan was a four-year-old Caucasian male diagnosed with an Early Childhood Developmental Delay (ECDD). He received school services from the speech-language pathologist, social worker, and occupational therapist. Declan also received Applied Behavior Analysis (ABA) services outside of school hours in a clinical setting. He was enrolled in the classroom for less than one year prior to the start of data collection. One of the primary goals

from his Individualized Education Plan (IEP) was to sit at morning group for two to seven minutes with minimal prompting in four out of five consecutive opportunities as measured by teacher observation and recorded data. Declan's strengths included strong communication skills, ability to use the bathroom independently, and social interaction with adults (i.e., saying "hello"). His aberrant behaviors included leaving morning group to access toys, running from the teacher while being redirected back to carpet, and refusal (i.e., saying "no" followed by a demand). For example, if the teacher were to say, "It is time to sit", Declan would respond with "No time to sit". According to the QABF, the function of Declan's behavior was primarily maintained by attention and secondarily maintained by escape and access to tangibles functions of behavior. Based on the *Abilities Index* completed by his teacher, Declan was rated as five for "severe disability" in the area of social skills and a four for "moderately inappropriate behaviors" for behavior and social skills section. He was rated as a four, "moderate disability" for intellectual functioning and a four for "moderate disability" as it relates to intentional communication. For the SSIS, teachers reported his pre-test data as in the 1st percentile for social skills and in the 89th percentile for problem behavior.

Joey was a three-year-old Multi-Racial (Native American Indian, Black, and White) male diagnosed with autism. He also received ABA services outside of school hours in a clinical setting. He was enrolled in the ECSE classroom for two months prior to the start of data collection. According to his teacher, his goal for sitting at morning group was five minutes with minimal support. Joey's strengths included identifying colors, numbers, and letters, completing puzzles, and independent toy play. His aberrant behaviors included leaving morning group to access toys, flopping and rolling on the floor when upset or frustrated, and banging head to floor. According to the QABF, the function of Joey's behavior was primarily maintained by escape and

secondarily maintained by attention and access to tangibles functions of behavior. Based on the *Abilities Index* completed by his teacher, Joey was a rated as a four for “moderate disability” and engaging in “moderately inappropriate behaviors” for behavior and social skills. In addition, he was rated as a three for “mild disability” in intellectual functioning and a four for “moderate disability” as it relates to intentional communication. For the SSIS, teachers reported his pre-test data as in the 5th percentile for social skills and in the 72nd percentile for problem behavior.

### **Teacher Participant**

Susie was the lead teacher in ECSE classroom. She earned a Bachelor’s degree in Early Childhood Education, as well as a Master’s degree in Early Childhood Special Education. She was a paraprofessional for children with autism for a total of three years in a self-contained special education classroom. Currently, she has served as the lead teacher for the past three years in the self-contained classroom. Susie has taken one course in applied behavior analysis, as well as attended an online seminar in ABA. During preliminary observations and discussions, Susie was observed to be patient and flexible with students. For example, prior to this study, she had incorporated many accommodations, such as flexible seating, fidget toy options, and modifications to the classroom routine and expectations. She was open to trying new programs and interventions to reach her children’s IEP goals and took great effort to advance their success.

### **Materials**

Each child participant was provided access to different materials for the intervention. For Mario, a break card that was a 10.5 cm x 6.5 cm was used. The break card incorporated a piece of paper with the word “Break” written on it in black letters and highlighted in yellow. His teacher mentioned that he had a sensory preference associated with touching specific textures (i.e., play-doh). Using this information, we decided to use a different item for the break card that

provided more reinforcement. Mario enjoyed playing with spinning gears during his free time, so the same “break” picture was placed onto a 9 cm across purple spinning gear toy. The break card gear, as well as the original piece of paper, was placed onto a 32 cm x 37 cm blue stool within a foot of the edge of the morning group carpet. The stool placement was consistent across baseline intervention, and withdrawal sessions to provide easy access for the child.

A reinforcer bin was used for Declan. The plastic and clear bin was a 33 cm x 18 cm and was filled with fidget toys, such as stretch or spin toys, toy robots, and a bubble timer. Some toys for Joey’s intervention were used such as a Wooden Maze toy, a Peg Board toy, and puzzles. A Motiv-Aider was used for both Declan and Joey’s interventions.

## **Measurement**

Two dependent variables were measured as part of this study: 1) aberrant behavior; and 2) prosocial behavior. Aberrant behavior was defined as any instance in which the participants eloped from the instructional area (Hu & Lee, 2019). For this study, aberrant behavior was observed to be elopement from morning group activities. We also measured break requests and time spent on carpet as a measure of engagement and cooperation in morning group activities.

Data was collected using a partial interval recording method of ten-second intervals and was recorded during the baseline intervention as a response of “+” or “-“. A “+” was recorded if the participant was on the morning group carpet. A “-“ was recorded if the participant was not on the morning group carpet. A break card was present during baseline to give the participants an opportunity to exchange the break card before leaving carpet. An “I” would be recorded if a break card exchange occurred, meaning an independent response was made.

## **Research Design**

A nonconcurrent multiple baseline design with embedded withdrawal was used to evaluate the extent to which the implementation of antecedent interventions would reduce aberrant behavior and increase prosocial interaction in young children with autism (Gast et al., 2014).

### **Preliminary Observation**

A minimum of three 30-minute observations were conducted by the student researcher to identify the environmental events that co-occurred with the aberrant behaviors. Antecedent and consequence events were described to identify the hypothesized function of the target children's problem behaviors and replacement behaviors. First, an observation of the environmental contingencies that maintain the problem behavior was conducted. Then, three to five instances of the behavior were collected to identify a function of the behavior, reinforcement contingencies, and need for teaching communication. Second, data was also collected from the Questions About Behavioral Function (QABF) questionnaire to corroborate data from the descriptive analysis. The QABF (Paclawskyj et al., 2000) was provided to the teacher to complete on each child participant prior to data collection. The QABF is an indirect assessment to determine a child's function of their perceived challenging behaviors. Finally, data was discussed with the lead researcher and lead classroom teacher to confirm the function of behavior and relevant intervention supports.

### **Baseline** [morning group routine]

Fifteen-minute baseline conditions were conducted during morning group activities. During baseline, children and teachers proceeded throughout the classroom routine as normal. The lead teacher went through morning group expectations and activities, such as identifying

feelings, the weather, days of the week, etc. During each session, the researcher did not provide any specific instructions or prompts regarding elopement. The break card was placed onto a 32 cm x 37 cm blue stool within a foot of the edge of the morning group carpet. Each time the participants engaged in elopement; the behavior was ignored by the researcher. The teacher used physical redirection or redirection with a tangible to bring the child back to morning group. If the elopement would have caused harm to oneself or to others, such as climbing on shelves or kicking others, the behavior was blocked physically by the teacher by moving other children or blocking the self-injurious behavior. The baseline session continued until the lead teacher signaled that morning group had concluded stating, "Large group is all done".

### **Preference Assessment**

To determine child preferences, a questionnaire was sent to the lead teacher to rank children's top five preferred edibles. A preference assessment was given to the lead teacher to complete out for all participants. The results indicated that Mario's most preferred edibles were Goldfish Crackers, mini chocolate cookies, and pretzels; however, edibles were not reinforcing for Mario. It was determined that his automatic function of behavior, pacing back and forth provided more reinforcement than edibles. As such, Mario was allowed to pace back and forth after requesting a break. Declan's results indicated that his most preferred edibles were juice, goldfish crackers, and ritz crackers; however, edibles were not provided as reinforcement for Declan as well. It was determined that the attention function of behavior provided more reinforcement than the edibles. Lastly, Joey's mother completed the same questionnaire to identify his preferred tangibles. The results determined that his most preferred tangibles were puzzles, building blocks, and a Wooden Maze toy. These toys were selected as reinforcers for his intervention.

## **Teacher Training**

Teacher training occurred for two participants, Declan and Mario. Training was primarily instructional for both students. For Declan's intervention, training sessions involved discussion of: 1) classroom behavioral expectations; 2) social praise and attention examples; 3) identifying potent reinforcers to use for the reinforcer bin; and 4) redirection strategies (i.e. using toy that child wanted to engage with to redirect). For example, the student researcher and classroom teacher discussed the function of Declan's elopement behavior, described the components of the new intervention (adding social praise and addition of tangibles) and the student research described how to implement these components of the intervention. In addition, during training the teacher was provided with instruction on how to use a Motiv-Aider to buzz every minute so Declan could have access to social attention or a tangible from the reinforcer bin.

For Joey's intervention, training sessions involved discussion of: 1) classroom behavioral expectations; 2) tasks to complete when the Motiv-Aider buzzed; 3) identifying potent reinforcers; and 4) redirection strategies (i.e. only allowing access to the toy once a task was complete). The student researcher described the components of the intervention (addition of preferred tangibles with social praise) and how to implement components of the intervention. Again, the classroom teacher was provided with instruction on how to use a Motiv-Aider to buzz every two minutes as a reminder for prompting Joey to engage in a task, and to provide tangible reinforcement to Joey.

## **Mario's Intervention**

Intervention sessions began with the following discriminative stimulus (SD) from the teacher which indicated the morning group expectations: "My eyes are looking, my ears are listening, I am sitting on my chair, I am ready for large group." Prior to the session beginning,

the student researcher placed the break gear on the stool on the edge of the carpet. The break card was placed within two feet of the child's seat during the baseline condition. Once intervention began, Mario resisted grabbing the break card. As mentioned prior, his teacher mentioned that he had a sensory preference associated with touching specific textures, so a different item for the break card was used that provided more reinforcement. Mario enjoyed playing with spinning gears during his free time, so the same "Break" picture was placed onto a purple spinning gear toy. Once the SD was given, the researcher immediately provided a full prompt with one hand to the child to exchange the break gear to their other hand. Once the exchange was made, the researcher provided behavior specific praise, such as "Good job! You need a break!" while gradually guiding the child to take a break off carpet to a table in the classroom with the child's preferred edible. Because Mario did not seem interested in the edibles, and instead appeared to enjoy walking back and forth throughout the classroom, his reinforcer was changed from the edibles to "walking around off carpet." After a one-minute break, the child was prompted back to the carpet. The researcher waited 30 seconds before beginning the next trial. If the child returned to carpet before the minute break had elapsed, the following trial would begin as soon as the participant had returned. Once the 30 seconds on carpet had elapsed, the researcher fully prompted the child to make the exchange of the break gear again and gradually guided him off carpet to take his break. After the first two prompted trials, the researcher stood on the edge of the carpet and only prompted the child to make the exchange if an escape attempt was made. This process was repeated until the teacher provided the following SD which indicated the conclusion of morning group, "Morning group is all done." The student researcher used Most-to-Least Prompting procedures, only fading prompts (i.e. from a full prompt to a

partial prompt at the wrist) once the child was observed to demonstrate increased levels of independence (i.e. reaching for the break card on his own).

### **Declan's Intervention**

Declan's first intervention began with the following discriminative stimulus (SD) from the teacher which indicated the morning group expectations: "My eyes are looking, my ears are listening, I am sitting on my chair, I am ready for large group". Prior to the session beginning, the student researcher placed the break gear on the stool on the edge of the carpet. The break card was placed within two feet of the child's seat during the baseline condition. Once the SD was given, the researcher immediately provided a full prompt with one hand to the child to exchange the break gear to their other hand. Once the exchange was made, the researcher provided behavior specific praise, such as "Good job! You need a break" while gradually guiding the child to take a break off carpet to a table in the classroom with the child's preferred edible. Because Declan did not seem interested in the edibles, and tried playing with toys and climbing onto furniture for his teacher's attention, his reinforcer and intervention were changed from the edibles to the option to receive attention from his teacher while at carpet.

Due to a lack of behavioral change from the first intervention for Declan, a positive punishment procedure was implemented. Because Declan was receiving ABA clinical services outside of school, the research team discussed Declan's aberrant behavior (i.e., eloping) with the behavior analyst at his clinic. Declan's behavior analyst stated their current goal for Declan was sitting for one-minute independently which he had not mastered in the clinic. His clinic behavior analyst also shared that using minimal verbal prompts was effective for increasing the likelihood of his compliance. For Declan's second intervention, sessions began with the following discriminative stimulus (SD) from the teacher to indicate morning group expectations: "My eyes

are looking, my ears are listening, I am sitting on my chair, I am ready for large group”. Declan was able to pick a toy from the bin before or during morning group, or the teacher used items within the bin to redirect Declan back to carpet if he eloped from the area. Lastly, toys around the classroom were used for Declan’s intervention. If Declan showed interest in a toy before morning group began, the teacher used this toy to direct and redirect him to morning group. Prior to the session beginning, a Motiv-Aider was set on a fixed interval schedule of one-minute. Here, a different length of time was used for the intervention implementation based on discussion with his BCBA and head teacher as to what would be a reasonable time for access to the reinforcer. After one minute (determined by the Motiv-Aider), teacher provided attention to participant (i.e., “good job sitting!”, gave a high-five or backrub, “thanks for watching the video!”, etc.). If Declan eloped from morning group at any point, his teacher prompted him back to carpet with minimal vocal prompts (two or less). If the physical prompt did not keep the participant at morning group, his teacher used a tangible from the preferred items bin to redirect the child to the group (robots, pointer, lava lamp, etc.). If the child left the group with the reinforcer, the teacher removed the item from the child’s possession and offered it to the child only if he was back on carpet. This allowed for both social and tangible reinforcement from the teacher while at morning group. This process was repeated until the teacher provided the SD that indicated morning group had concluded, “Morning group is all done”.

### **Joey’s Intervention**

For the third participant, sessions began with the teacher-directed discriminative stimulus (SD): “My eyes are looking, my ears are listening, I am sitting on my chair, I am ready for large group”. Prior to the session beginning, a Motiv-Aider was set on a fixed interval schedule of two minutes. Here, a different length of time was used for the intervention implementation based on

discussion with the head teacher as to what would be a reasonable time for access to the reinforcer. First, Joey was guided to the carpet by teacher with preferred toy for morning group (i.e., Car Ramp, Wooden Bead Maze Toy, etc.) and was given access to the toy for two minutes. After two minutes (as determined by the Motiv-Aider), teacher removed/blocked access to preferred item and prompted child to participate in a morning activity (i.e., saying hello to a peer, moving picture to “present” on the board, counting with the counter, etc.). When the target participant adhered to the expectation, the teacher gave the preferred reinforcer back to the child, allowed access to the toy, and paired it with social reinforcement (i.e., “Good job! You are staying on carpet and learning with your friends.”). Any attempts to escape carpet were blocked by teacher. The next trial began as soon as the preferred toy (or a different toy) was given back to the child to have access to for two minutes. The teacher provided the child with a different preferred toy when Joey was satiated on the currently held preferred toy (i.e., child walking away from puzzle). This process was repeated until the teacher provided the SD that indicated morning group had concluded, “Morning group is all done”.

### **Withdrawal**

During maintenance for Mario, the intervention was not run by the researcher; however, the same stimuli was presented. The break gear was put on the same stool on the edge of the carpet with the student researcher present on the edge of the carpet. Thus, Mario had access to the stimuli and the opportunity to exchange the break gear to the researcher. No prompts were provided during the withdrawal phase.

Because Declan’s intervention data was variable and his time on carpet did not significantly decrease, a withdrawal phase was not conducted. A withdrawal phase for Declan would have included the head teacher running morning group as she did during the baseline

condition. Here, she would not provide attention every 1-minute determined by the Motiv-Aider. The lead teacher continued running intervention to support Declan to decrease his time off carpet and to support the practice of his social skills and his engagement in learning opportunities.

During withdrawal for Joey, the lead teacher ran morning group as normal. Here, Joey did not have access to preferred toys while at morning group, and the lead teacher did not prompt him to engage in a morning group task every two minutes as determined by the Motiv-Aider.

### **Procedural Fidelity**

For procedural fidelity, a checklist was created that contained the steps of the intervention that must have been implemented for each experimental condition. Appendix B depicts the fidelity checklist for each condition and for each participant's intervention. Procedural fidelity was calculated by dividing the number of correct steps, steps done precisely according to the checklist, by the total number of steps multiplied by 100. Fidelity data was gathered on 53% of the sessions for Mario. The mean fidelity score across sessions was 98% (range = 86% to 100%). Fidelity data was gathered on 0% of the sessions for Declan's first intervention but 36% for his second intervention. The mean fidelity score across sessions was 81% (range = 70% to 91%). Fidelity data was gathered on 38% of the sessions for Joey. The mean fidelity score across sessions was 87% (range = 85% to 88%).

### **Reliability**

Interobserver agreement (IOA) was calculated by comparing the primary observer's IOA data with the second observer's data for baseline, intervention, and maintenance sessions. The IOA data was calculated by dividing the number of agreements by the agreements plus disagreements and then multiplying that number by 100 to yield a percentage. Agreement was described as both observers recording the same response of "+" or "-". A "+" was recorded if the

participant was on the morning group carpet. A “-“ was recorded if the participant was off of the carpet. Reliability data collectors included a Board Certified Behavior Analyst (BCBA) with experience in behavioral data collection as well as a student researcher who was trained to collect observational data.

### **Social Validity**

Social validity data was gathered from the lead teacher via an open-ended questionnaire. The questionnaire assessed the teacher’s perception of utility and generalization of the interventions for each student. The teacher was specifically asked about any behavior changes they observed, any new skills that may have developed, and if the skills were observed outside of the classroom. In addition, the lead teacher was asked if they would suggest the intervention be used with other children, if they see themselves using preventative practices in the future, and to provide any additional feedback about the interventions applied.

The teacher reported observing behavior changes in Joey and Mario and a slight change in behavior for Declan. For Mario’s intervention, she stated that he “was able to demonstrate the skill of requesting a break during a teacher led activity (large group)” and felt as if “his time sitting during large group time increased.” For Joey’s intervention, she stated that “student’s participation increased tremendously once he was receiving teacher reinforcement and the tangible.” Once the intervention phase was withdrawn, “he was able to engage and participate during teacher led activities even without the presence of tangibles (toys)”. Overall, she stated that his engagement and participation had increased. For Declan’s intervention, she stated “I don’t think that he necessarily developed new skills, but he did engage a little more during teacher led activities (large group) and adult (teacher) support.”

Because the interventions were implemented during morning circle in the classroom, she did not see the skills used outside of the classroom. Although Susie stated she did not see the skills used outside of the classroom, Joey's mother "had reported that they are working on similar activities at ABA, and he had been doing very well." For Declan, Susie stated that she "could see these skills being used at a different setting (ABA)"; however, she was not notified of a "noticeable change on his behavior in this area. They are still working on having Declan engage/remain seated for a minute, and they use the iPad as a reinforcer." Overall, she did report that she would continue using preventative practices because they are "very helpful and effective" for her students.

## RESULTS

All three participants increased their time spent on carpet and decreased their elopement behaviors. During baseline, Mario left morning group quite often which required constant redirection from his teachers. At baseline, he left morning group 8% of time (average frequency of 5.8) and did not use any functional communication skills as demonstrated by zero instances of accessing the break card while it was present. During intervention, his break exchanges increased to higher levels while his elopement behaviors decreased to lower levels. The graph for elopement shows a descending trend, while his break requests slightly trend upward. The data for both variables did show some variability. Notably, during the withdrawal phase, a return to baseline levels was observed, which was an indication that his change in behavior was due to the effectiveness of the intervention, as opposed to maturation. In summary, Mario demonstrated a basic effect to the intervention and acquired new skills regarding functional communication.

During baseline, Declan left morning group quite often which required constant redirection from his teachers. At baseline, he left morning group 31% (average frequency of 18) of time and did not use any functional communication skills as demonstrated by zero instances of accessing the break card while it was present. Due to variability in the data with the break card intervention, and the attention seeking behaviors while off carpet, a positive punishment procedure was implemented. Here, the teacher provided social and tangible reinforcement which was only available on carpet. With the new intervention, his elopement decreased to lower levels, showing an overall decrease in trend. The data across all three phases did show variability. Because Declan's intervention data continued to show variability, and there was not a significant decrease in time off carpet, a withdrawal phase was not conducted. The lead teacher

continued implementation of preventative practices to decrease his time off carpet and increase his engagement in learning opportunities.

The purpose of the third intervention was to allow Joey access to tangibles while sitting on carpet for morning group. During baseline, he engaged in the highest frequency of time off carpet compared to the first two participants. At baseline, he left morning group 50% of time (average frequency of 51) and did not use any functional communication skills as demonstrated by zero instances of accessing the break card while it was present. During intervention, his elopement behaviors decreased, lowering in levels significantly. He demonstrated an overall decreasing trend, and his data was stable throughout. The variability in his data was lower compared to the first two participants. Thus, a basic effect was observed for baseline and intervention. Notably, his time off carpet during the withdrawal phase approached near zero levels, which was significantly lower than the first two participants. During the first three days of the withdrawal phase, he approached near zero levels; however, the fourth and fifth day his time off carpet began to increase, which was an indication that his change in behavior was due to the effectiveness of the intervention, as opposed to maturation.

### **Interobserver Agreement**

The average agreement for Mario's baseline was 98% (range = 96%-100%) with 40% of his baseline sessions having IOA data. The average agreement for Mario's intervention was 93% (range = 88%-100%) with 33% of his intervention sessions having IOA data. The average agreement for Mario's maintenance probes was 97% (range = 96%-98%) with 38% of his maintenance probes having IOA data. No IOA data was taken for Declan's baseline or first intervention sessions. The average agreement for Declan's second intervention was 98.6% (range = 96%-100%) with 20% of his second intervention sessions having IOA data. The average

agreement for Joey's baseline was 98% (range = 97%-99%) with 33% of his baseline sessions having IOA data. The average agreement for Joey's intervention was 99% (range = 98%-100%) with 25% of his baseline sessions having IOA data. The average agreement for Joey's maintenance probes was 96.5% (range = 93%-100) with 40% of his maintenance probes having IOA data.

## DISCUSSION

The purpose of this study was to examine the implementation of antecedent interventions, including functional communication training, to decrease aberrant behaviors and increase prosocial behaviors in young children with autism and developmental delays. Overall, results did not indicate a functional relation; however, a basic effect was demonstrated for the first and third participant. Given these outcomes, there are several points for discussion.

First, it is important to identify potential reinforcers for young children that are matched to the function of behavior. Consistent with current research, reinforcement may change for children over time and continued observation and data collection help to identify how these reinforcements change over time, for whom, and under what conditions (Pennington et al., 2012). That is, children may engage in elopement behaviors across settings due to a variety of different reinforcers. For example, a child may elope from gym class to avoid the loud screams in the gym, but later in the day elope from a small group activity to receive attention from their teacher. It is stated that interventions without prior observational and assessment data may result in undesirable outcomes, such as the strengthening of the problem behavior (Pennington et al., 2012). Here, when the first intervention was put into place for Declan, he began to engage in attention seeking behaviors (i.e., climbing on furniture, leaving classroom, etc.). The intervention was changed to match the function of behavior and the different reinforcement (attention from the teacher rather than taking a break from morning group).

Second, individual variation in responding is another important consideration as it relates to designing interventions for escape-maintained behaviors. Here, a “one size fits all” approach did not work well for two participants in this study. Thus, is important to identify the function of the child’s behavior before deciding on an intervention. For example, in Declan’s first

intervention, the escape function of behavior and addition of a functional communication opportunity did not significantly decrease his time off carpet or his communication skills. During the first intervention, Declan began engaging in behaviors maintained by attention and access to tangibles, such as leaving carpet, trying to access toys, climbing on furniture, etc. Once the new intervention began, with the focus of attention and access to tangibles, his time off carpet began to decrease. With this, although the break card and access off carpet intervention worked for Mario, Declan's needs were not being met with this intervention in place. Implementing an intervention that was specific to the child's function of behavior, as well as individualizing the intervention to specific child reinforcers, was more significant in decreasing the child's time off carpet and allowed for more learning opportunities from the teacher and peers while present. Several studies document the importance of matching the function of behavior to an intervention and even show that one behavior can have multiple functions (Reese et al., 2003; Boyle et al. 2022; Pennington et al., 2012). For example, components of a treatment can be chosen to focus on modifying the environment and teaching appropriate behaviors that serve the same function (or address the multiple functions) of the aberrant behavior (Reese et al., 2003). These results provide additional insight into which functions of behavior are important to prioritize to aid in supporting children's access and opportunity to classroom learning and instruction in natural settings.

Third, results from this study highlight the importance of implementing several classroom preventative practices at once to address multiple functions of one behavior (Fox et al., 2003). Consistent with previous research on use of antecedent based interventions in classroom settings (Hemmeter et al., 2016; Stanton-Chapman et al., 2016), using a variety of classroom preventive practices is important. For example, providing children with both positive feedback for prosocial

behavior, considering classroom environmental/physical arrangement, and explicit teaching about routines and expectations can increase the likelihood of prosocial behaviors and decrease perceived challenging behaviors. There are many reasons why a child may escape from a classroom routine, such as morning group. When evaluating a new intervention for Declan, use of a variety of preventive practices and changes to the environment and routine were implemented to address multiple functions to his behavior. For example, one of the categories in the classroom's morning routine consisted of a letter of the week video. Because Declan found robots reinforcing, the teacher implemented a different letter of the week video with robots instead of the original. During this time in morning group, the teacher provided Declan with the opportunity to pick a letter of the week song (the original or the robot version). Declan would consistently pick the new song, where he stayed on carpet to watch the new video. Here, we observed how making parsimonious changes using a variety of preventative strategies helped to decrease Declan's challenging behaviors and also allowed for access to meaningful and high-quality instruction.

A final point for discussion to highlight is the importance of teaming and collaboration when using descriptive data to design evidence-based interventions for children in natural contexts (Wahman et al., 2021). For all three participants, the student researcher and lead teacher were engaged in constant collaboration to discuss the effectiveness of the interventions employed. Furthermore, once it was decided to introduce a new intervention with Declan, the student researcher met and discussed goals and mastery criterion for Declan with a Board-Certified Behavior Analyst (BCBA) who provided services for him in a clinical setting. His BCBA shared that he had not yet mastered sitting in his seat for one minute in the clinical therapy setting. Using this information, the student researcher and lead teacher were able to gain

a better understanding of the child's ability to stay seated for a set duration of time. Because Declan was consistently not sitting for a specific amount of time across settings, collaboration strategies were discussed, such as use of specific reinforcers to decrease his time off carpet and increase his prosocial behaviors of engaging and participating in the classroom's morning group routine. Consistent with current literature, collaboration and teaming efforts are an efficient way to advance and promote positive social, emotional, and behavioral outcomes for young children with disabilities to ensure consistency across environments and people (Reese et al., 2003).

### **Limitations**

There are three limitations that should be considered when interpreting the results of this study. The first limitation was that no basic effect was observed for Declan and no functional relation was established for all participants. As such, no withdrawal phase was conducted for Declan. A second limitation includes the lack of Behavioral Skills Training for the lead teacher which would have enhanced fidelity of implementation for the intervention for Declan (Kirkpatrick et al., 2019). There are many challenges to conducting applied research in natural settings which makes it difficult to control for variables like limited teacher time and resources, student absences, teacher absences/substitutes, and the impact of other children's behaviors on a teacher's ability to adhere to fidelity of implementation for a specific child. With this, a lack of consistency in intervention implementation was unavoidable. A final limitation is that reliability data was less than 33% for Declan's baseline, first, and second intervention phase, and Joey's intervention phase. Interobserver agreement is an important quality indicator for single case experimental design (Kratochwill et al., 2021). Without strict adherence to these metrics, accuracy of data can be questioned.

## **Future Research**

There are four areas where future research is warranted. First, future research should examine the generalization of the skill to other relevant adults in the classroom. For example, the student researcher taught Mario the exchange of the break card; however, this skill was not tested for generalization with the head teacher. With this, if the student researcher were to fade supports, it would be important for the child to generalize this skill with the lead teacher to ensure the skill was maintained across adults. According to Cooper et al. in 2020, “Gradually shifting from the contrived conditions of the intervention to the typical, everyday environment will increase the likelihood that the learner will maintain the new behavior patterns.” Future research should also aim to examine escape-maintained interventions for children with varying disability types to determine the efficacy of this intervention for different child populations and how outcomes may vary across child participants. With this knowledge, the field would move closer to identifying evidence-based interventions that can be applied to different children under different conditions.

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## APPENDIX A:

### BASELINE DATA SHEET

Key:

“+” on carpet

“-“ off carpet

|         |    | 10 second intervals |   |   |   |   |   |
|---------|----|---------------------|---|---|---|---|---|
| Minutes |    | 1                   | 2 | 3 | 4 | 5 | 6 |
|         | 1  |                     |   |   |   |   |   |
|         | 2  |                     |   |   |   |   |   |
|         | 3  |                     |   |   |   |   |   |
|         | 4  |                     |   |   |   |   |   |
|         | 5  |                     |   |   |   |   |   |
|         | 6  |                     |   |   |   |   | - |
|         | 7  |                     |   |   |   |   |   |
|         | 8  |                     |   |   |   |   |   |
|         | 9  |                     |   |   |   |   |   |
|         | 10 |                     |   |   |   |   |   |
|         | 11 |                     |   |   |   |   |   |
|         | 12 |                     |   |   |   |   |   |
|         | 13 |                     |   |   |   |   |   |
|         | 14 |                     |   |   |   |   |   |

## APPENDIX B:

### PROCEDURAL FIDELITY

Mario's Intervention:

| Steps             | Task                                                                                                                                                                                                                                                                     | Yes (Y) / No (N)/ Not Applicable (NA) |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 1. <u>Prompts</u> | Researcher waited for the target stimulus: Teacher begins by stating morning group expectations (Ears are listening, mouth is quiet, etc.)                                                                                                                               | Y / N / NA                            |
| 2.                | Researcher immediately prompts participant with most intrusive prompt to grab break item and exchange it to researcher with other hand.                                                                                                                                  | Y / N / NA                            |
| 3.                | If the participant did not respond to the most intrusive prompt, repeat the prompt, or provide a more intrusive prompt (i.e., full prompt).                                                                                                                              | Y / N / NA                            |
| 4.                | When the target participant adhered to the behavioral expectation, the researcher reinforced the child's behavior with behavior specific praise (i.e., "Good job! You need a break.").                                                                                   | Y / N / NA                            |
| 5.                | The researcher prompts child to leave carpet with gradual guidance.                                                                                                                                                                                                      | Y / N / NA                            |
| 6.                | Researcher allows participant to take one minute break from morning group before prompting him to return to carpet. (If participant returns to carpet on his own before the one-minute break, the next step will begin as soon as participant is back at morning group). | Y / N / NA                            |
| 7.                | Once participant is back on carpet, researcher will wait one minute before prompting the next trial.                                                                                                                                                                     | Y / N / NA                            |
| 8. Trial 2        | Researcher immediately prompts participant with most intrusive prompt to grab break item and exchange it to researcher with other hand.                                                                                                                                  | Y / N / NA                            |
| 9.                | If the participant did not respond to the most intrusive prompt, repeat the prompt, or provide a more intrusive prompt (i.e., full prompt).                                                                                                                              | Y / N / NA                            |
| 10.               | When the target participant adhered to the behavioral expectation, the researcher reinforced the child's behavior with behavior specific praise (i.e., "Good job! You need a break.").                                                                                   | Y / N / NA                            |

|                     |                                                                                                                                                                                                                                                                          |            |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 11.                 | The researcher prompts child to leave carpet with gradual guidance.                                                                                                                                                                                                      | Y / N / NA |
| 12.                 | Researcher allows participant to take one minute break from morning group before prompting him to return to carpet. (If participant returns to carpet on his own before the one-minute break, the next step will begin as soon as participant is back at morning group). | Y / N / NA |
| 13.                 | Once participant is back on carpet, researcher will wait one minute before prompting the next trial.                                                                                                                                                                     | Y / N / NA |
| 14. Trial 3         | Researcher immediately prompts participant with most intrusive prompt to grab break item and exchange it to researcher with other hand.                                                                                                                                  | Y / N / NA |
| 15.                 | If the participant did not respond to the most intrusive prompt, repeat the prompt, or provide a more intrusive prompt (i.e., full prompt).                                                                                                                              | Y / N / NA |
| 16.                 | When the target participant adhered to the behavioral expectation, the researcher reinforced the child's behavior with behavior specific praise (i.e., "Good job! You need a break.").                                                                                   | Y / N / NA |
| 17.                 | The researcher prompts child to leave carpet with gradual guidance.                                                                                                                                                                                                      | Y / N / NA |
| 18.                 | Researcher allows participant to take one minute break from morning group before prompting him to return to carpet. (If participant returns to carpet on his own before the one-minute break, the next step will begin as soon as participant is back at morning group). | Y / N / NA |
| 19. End of 3 trials | Researcher now waits on the edge of the carpet and only prompts student to exchange break item if an escape attempt is made. (Repeat steps 2-7 if escape attempt occurs)                                                                                                 | Y / N / NA |
| <b>Total</b>        |                                                                                                                                                                                                                                                                          | <b>/19</b> |

Note. Table depicts procedural fidelity for Mario's intervention, specifically what the researcher engaged in when running the intervention.

Declan's Second Intervention:

#### **Procedural Fidelity [Intervention 2]**

Date:

Start:

Finish:

Implementer:

Data Collector:

Key: Yes, No, Not

1. Teacher begins group by stating morning group expectations (i.e., “Ears are listening, mouth is quiet,” etc.)

|          |    |    |    |    |    |    |    |    |    |     |     |     |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| <b>1</b> | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 |
|          |    |    |    |    |    |    |    |    |    |     |     |     |

2. After 1-min. (determined by the Motiv-Aider), teacher provides attention to participant if participant is engaged in appropriate morning group behavior (i.e., “Good job sitting!”, high-five, backrub, “Thanks for watching the video!”, etc.)

|          |    |    |    |    |    |    |    |    |    |     |     |     |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| <b>2</b> | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 |
|          |    |    |    |    |    |    |    |    |    |     |     |     |

3. If the child leaves morning group at any time, teacher prompts student back to carpet with minimal vocal and/or physical prompts (2 or less).

|          |    |    |    |    |    |    |    |    |    |     |     |     |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| <b>3</b> | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 |
|          |    |    |    |    |    |    |    |    |    |     |     |     |

4. If the verbal and/or physical prompting does not keep the participant at morning group, teacher uses a tangible from the preferred items bin to redirect the student to the group (i.e., robots, pointer, lava lamp, etc.).

|          |    |    |    |    |    |    |    |    |    |     |     |     |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| <b>4</b> | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 |
|          |    |    |    |    |    |    |    |    |    |     |     |     |

5. If the student leaves the group with the tangible, teacher removes item from child’s possession and offers it to student upon return to carpet (*That is, reinforcement only allowed while at morning group*).

|          |    |    |    |    |    |    |    |    |    |     |     |     |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| <b>5</b> | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|

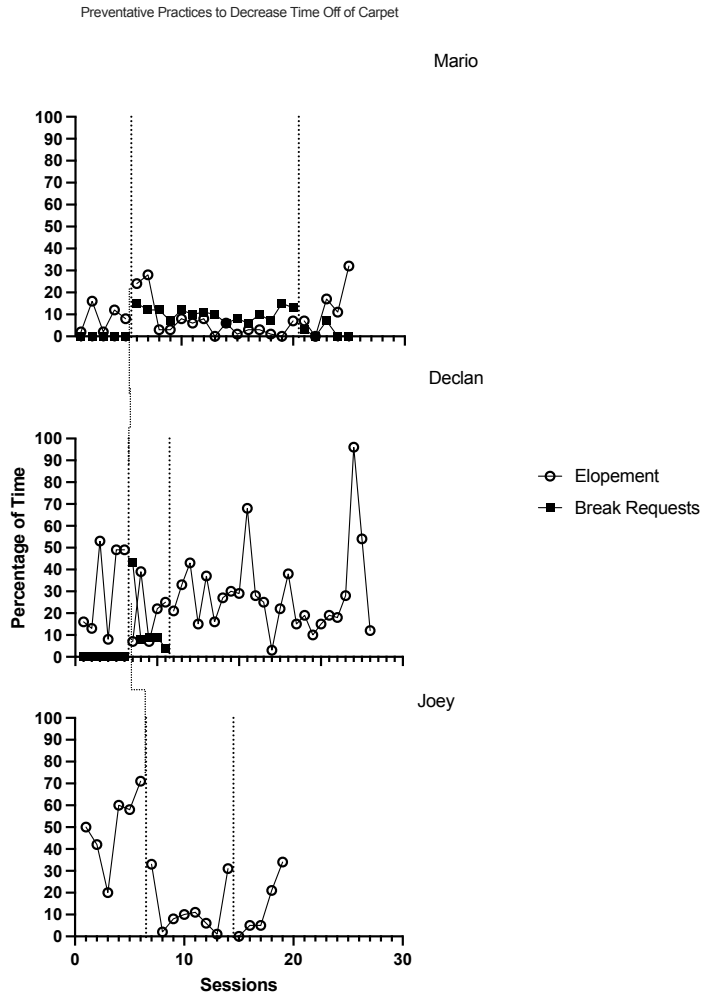


|                                                                                                                |                                                                                                                                                                                        |            |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                                                                                                                | carpet and learning with your friends.”).                                                                                                                                              |            |
| <u>7.</u>                                                                                                      | Any attempts to escape carpet were blocked by classroom staff (i.e., teacher, student researcher, or paraprofessional).                                                                | Y / N / NA |
| <u>8.</u>                                                                                                      | The next trial began as soon as the preferred toy (or a different toy) is given back to the student to have access to for 2-minutes.                                                   | Y / N / NA |
| <u>9.</u>                                                                                                      | Classroom staff (i.e., teacher, student researcher, or paraprofessional) provided student with a different preferred toy when satiation was observed for currently held preferred toy. | Y / N / NA |
| 10.<br>Steps 1-9 are repeated until morning group is done. Teacher says, “Ok. Now, it’s time for small group.” |                                                                                                                                                                                        | Y / N / NA |

Note. Table depicts procedural fidelity for Joey’s intervention, specifically what the researcher engaged in when running the intervention.

## APPENDIX C:

### PERCENTAGE OF TIME OFF CARPET



Note. Figure depicts preventative practices implemented to decrease time off carpet across participants. The open circle represents elopement, while the closed square represents break requests.

Figure 1: Figure depicts preventative practices implemented to decrease time off carpet across participants. The open circle represents elopement, while the closed square represents break requests.