Reducing Screaming when Items/Toys are Touched by Others

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Reducing Screaming when Items/Toys are Touched by Others

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
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ABSTRACT

Differential and positive reinforcement are non-intrusive interventions that have proven to be successful in decreasing problem behavior. This study aims to decrease the screaming behavior exhibited by a four-year-old male diagnosed with autism spectrum disorder (ASD) by using differential reinforcement without extinction alongside positive reinforcement in the form of edibles. The researcher hypothesized that the use of both interventions would be more effective than the use of one intervention. Using an AB experimental design, the intervention was successful in producing an 80% decrease from baseline screaming. Though successful, many limitations were presented throughout the study, affecting the consistency and replicability of the study.
CHAPTER 1: INTRODUCTION

When targeting escape-maintained behaviors, interventions such as positive reinforcement (Payne & Dozier, 2013), negative reinforcement (Kodak & Miltenberger, 2013) and differential reinforcement (Chowdhury & Benson, 2011) have proven successful. However, the nature of some of these interventions may not always be feasible to implement across environments. For this reason, it is important to assess the circumstances in which the behavior is happening to put the best intervention in place. A commonly used procedure to decrease behaviors maintained by negative reinforcement, specifically escape-maintained behavior, is escape extinction. As an alternative, positive reinforcement is a behavioral procedure that may be safer than some of these traditional methods of addressing escape-maintained behaviors (i.e., escape extinction) and more preferred by those implementing the treatment (Payne & Dozier, 2013). Positive reinforcement refers to the addition of a stimulus that strengthens the behavior (Miltenberger, 2015).

In contrast, negative reinforcement is the removal of a stimulus that strengthens a behavior (Miltenberger, 2015). Payne and Dozier (2013) reviewed research on the effects of positive reinforcement as an intervention for escape-maintained behavior and found there may be more buy-in from those who implement the procedure. For example, it may be more feasible for a teacher to provide verbal praise or a tangible item as reinforcement for an appropriate alternative behavior instead of implementing escape extinction in the middle of an instructional lesson. Fisher and Kelley (2010) supported this claim through a study conducted in which they
provided food and praise on a variable interval (VI) 15 s schedule while allowing for escape on a fixed-ratio (FR) 1 schedule to decrease various topographies of escape-maintained problem behavior exhibited by three males. Therapists placed a demand and followed the prompting hierarchy from verbal, gestural, to physical prompts every 10 s until the participant completed the task. If problem behavior occurred, all prompting stopped for 20 s. In the absence of problem behavior, the therapist delivered a highly preferred edible item and praise unrelated to the demand on a VI 15 s. Results showed that all three participants in this study reduced problem behaviors when the VI 15 s was in place, even when the opportunity for escape was available. The authors concluded that preference for the edible reinforcer might be due to the preference of positive over negative reinforcement; or positive reinforcement acting as an abolishing operation, making demands less aversive. The current research on using positive reinforcement to reduce problem behavior has shown to favor the intervention (Payne & Dozier, 2013), so analysts should consider positive reinforcement as an intervention to reduce problem behavior.

Similar to the way positive reinforcement reduces problem behavior, there is research to support that differential reinforcement (DR) is an effective, non-intrusive intervention in decreasing problem behavior (Chowdhury & Benson, 2011). One of the components of DR is typically extinction, but in some cases, extinction for a behavior may not be applicable or even dangerous (Fisher et al., 1993; Athens & Vollmer, 2010). In these situations, reinforcement can be provided for an alternative behavior without extinction implemented for the problem behavior. For example, Athens and Vollmer (2010) evaluated differential reinforcement of alternative behavior (DRA) without extinction, with results demonstrating consistent behavior change when multiple reinforcement components were presented in favor of the appropriate
alternative behavior. The study's results suggest that extinction may not always be necessary to decrease problem behavior when using differential reinforcement.

An example of a problem behavior that may not be necessary to completely reduce, and therefore not place on extinction, is screaming. For some individuals, screaming may be the only form of vocalization or communication. Therefore, putting the behavior on extinction could further exacerbate a communication deficit. Additionally, treatment without extinction would allow future shaping procedures to transform the screaming into a more socially acceptable topography. This case study aimed to decrease screaming exhibited by a 4-year-old male diagnosed with autism spectrum disorder (ASD) by implementing DR without extinction and positive reinforcement for an alternative behavior. The researcher hypothesized that implementing a DR procedure while providing positive reinforcement for manding skills already in the participant’s repertoire (e.g., touching the item to request) could potentially improve the effectiveness of his manding in different environments and with different people, particularly those who are less familiar with his communication styles.
CHAPTER 2: METHOD

Participant

The participant was a 4-year-old male diagnosed with ASD and was in his first month of receiving ABA services. At the time of the study, the participant did not use words or phrases to communicate and instead would use pointing, touching, or leading to indicate wants and needs. The participant engaged in screaming with simultaneous hand gestures. The researcher observed the behavior when the participant was playing with a toy/item, and when others were touching or nearby that toy/item.

The participant’s analysts did not conduct a functional analysis to determine the function of the screaming behavior. However, through direct (ABC data) and indirect (initial intake assessment performed by BCBA prior to the start of this study) assessments, the hypothesized function of the behavior was escape and access to tangibles. Given that the participant had recently began receiving ABA services, no programming (e.g., echoic, picture exchange communication system, functional communication training, etc.) was in place to appropriately replace the screaming behavior observed with the gestures.

Setting

This study occurred in a clinic setting in the greater Tampa area. The participant in this study received applied behavior analysis (ABA) services at this clinic for approximately 12 hours a week. The study took place during the participants’ scheduled ABA sessions with a
registered behavior technician (RBT). The clinic had several therapy rooms that allowed for individualized 1:1 ABA therapy with each room consisting of one to two clients per room. The clinic also had two other rooms used for natural environment training (NET). The researcher taught the skill in the therapy room and evaluated the use of the skill in the NET room. Between 1-5 clients and their therapists were in these NET rooms throughout the day. Peers and other adults were present in the NET rooms allowing for the opportunity to evaluate naturalistic and contrived interactions between the participant and others. Additional materials for this study include edible reinforcers and toys (preferred).

The researcher collected data for five research sessions embedded into 1.5-2-hour direct ABA sessions for the evaluation of baseline. One research session in the baseline phase consisted of three opportunities to engage in screaming. The researcher collected data for eleven research sessions embedded into two 3-hour direct ABA sessions for the evaluation of the dependent variable. One research session in the intervention phase consisted of five opportunities to engage in screaming.

**Dependent Variable and Measurement**

The behavior observed in this study was the participant’s screaming in social situations, specifically, when peers/adults touched or were in proximity of (approximately 3-4 feet) the participant or his toys. Screaming was defined as making loud vocalizations while facing/looking at a peer or adult and holding open hands (one or both) out in the direction of a peer/adult. As mentioned before, the participant’s gestural manding repertoire included pointing, touching, and leading. However, the participant did not use these mands while screaming.

The participant’s behavior was categorized as following:
**Screaming:** Loud vocalizations paired with facing/looking at the peer/adult and holding out open hands (one or both) in the direction of a peer/adult without physically touching the item he wanted.

**Manding:** Physically placing his open palm on the item without pulling, tugging, or snatching the item. This could occur with or without screaming.

**No Response:** The participant did not engage in any form of screaming or any kind of touching of the item/toy.

Opportunities to engage in screaming, manding or no response presented as touch-based or proximity-based opportunities. Touch-based opportunities referred to the opportunities in which peers/adults physically touched or picked up an item of the participants. Proximity based opportunity referred to the opportunities in which a peer/adult was in proximity of (approximately 3-4 feet) the participant or his toys, but not physically touching the toys or the participant. Given the participant still had the opportunity to engage in the same behaviors, (the only difference being that instead of manding for the toy/item back in touch-based opportunities, he was manding for the toy/item to be moved away from the peer/adult in proximity-based opportunities) the researcher scored proximity-based, and touch-based opportunities the same.

Data were collected on the occurrence of screaming, screaming plus a mand, mand, and no response. Data on manding were only collected to the extent of being paired with or without a scream. Data were measured in percent of opportunities the participant engaged in screaming per session.
Experimental Design

The researcher evaluated the effectiveness of differential reinforcement in an AB design. The researcher used the AB sequence to evaluate the baseline (A) and intervention (B) phases. No further research was conducted beyond the intervention phase.

Procedures

**Baseline.** The researcher accompanied the participant to the NET room where the participant could engage freely with gross motor toys/items. The researcher allowed for natural engagement opportunities if peers/other adults were in the room. A naturally occurring engagement occurred when a peer or adult approached the participant to engage with him or the toys. If no one else was present in the room or no natural opportunities occurred for an extended period, (not formally timed using any measurement device, however, anecdotally, the time between opportunities varied between 5 and 20 minutes) the researcher would mimic a naturally occurring engagement. If screaming occurred, the researcher recorded the screaming and instructed the peer/adult to return the toy/item to the participant and step away from the participant and his toys.

**Intervention.** When the participant came in for ABA sessions, the researcher directed him to his therapy room, which he shared with one other client. The researcher then directed him toward his desk and offered his lunch box. Once he took his lunch box, he sat at the table in his therapy room, opened the lunch box, and assessed the freely available snacks. He would then select a snack and hand it to the researcher. The researcher gave him a small amount (1 or 2 pieces), then put those snacks aside and offered him another snack in his lunch box. The participant had free access to all other snacks and lunch meals at whatever time; however, the
snack he selected first was used as reinforcement for sessions that day. Once sessions were complete, if there were any left-over of that snack, it was put back in his lunchbox and sent home.

**Pre-Intervention Teaching Trial.** Immediately after identifying the reinforcer and before giving the participant access to the NET room, the researcher conducted a pre-intervention teaching trial. The teaching trial intended to teach the participant that manding without pulling, tugging, or snatching and without screaming, would result in access to the item, plus an edible reinforcer. The researcher sat at a table in the therapy room with neutral stimuli (e.g., a fine motor item such as a puzzle piece or marker) and began interacting with the stimuli without handing it to the participant. Once the participant manded appropriately without screaming, the researcher provided the item, the edible reinforcer, and behavior-specific praise (i.e., “I love how you touched the puzzle without screaming! That was great asking!”). The teaching trial was repeated 2-3 times in quick succession.

**Differential Reinforcement.** After the teaching trial, the researcher waited for the participant to show motivation to go to the NET room. The participant typically displayed motivation by walking to the door and touching the door handle while looking at the researcher. The researcher accompanied the participant to the NET room where he could engage freely with toys/items. The researcher allowed for natural engagement opportunities if peers/other adults were in the room. If no one else was present in the room or there had been no natural opportunities for an extended period (not timed), the researcher would mimic a naturally occurring engagement.
If the participant engaged in screaming, the researcher waited until there was a break in
his screaming for approximately 3 s. Then he was given another opportunity to mand
appropriately. If the participant screamed while manding he was given the item as reinforcement
without any praise or edibles. If he mandated without screaming, he received the item plus the
edible reinforcement.
CHAPTER 3: RESULTS

The average percent of opportunity for screaming during baseline was 93.4%, and the average percent of screaming during the intervention phase was 16.3%. The participant attained the original goal of an 80% decrease with an 82.5% decrease in screaming from baseline. The participants percentage for manding during baseline was 0%, and the average percentage for manding during the intervention phase was 83.6%. There is some variability in the data, which may be due to various extraneous variables and limitations during sessions. Despite variabilities, the screaming level decreased while manding levels increased throughout the intervention. Figure 1 displays the decrease in screaming and the increase in manding between baseline and intervention.
Figure 1. Screaming and manding levels displayed in percent of opportunities per session.
CHAPTER 4: DISCUSSION

This study aimed to reduce screaming in a 4-year-old male diagnosed with ASD. The study used differential reinforcement without extinction to reduce screaming and adding to his manding repertoire by appropriately touching desired items.

The researcher didn’t conduct a formal functional analysis to identify the function of the participant’s screaming behavior. However, through observation and indirect assessments such as caregiver interviews during the participants intake process to the clinic, the function of his screaming behavior was hypothesized to be maintained by access to tangibles and escape (gaining access to toy and escape from others touching his toys or others moving away from the area that he was playing in).

Under this hypothesis, and knowledge from Fisher and Kelly (2010) regarding preference of positive reinforcement while negative reinforcement is still available, the intervention of this study allowed for opportunities for the participant to contact positive reinforcement (i.e., edible reinforcement and access to tangible) while still being able to escape (i.e., others not touching his toys and others moving away from his play area). Each opportunity the participant had to engage in behavior was also an opportunity to escape or contact positive reinforcement. The results of this study hypothesized that a differential reinforcement procedure without extinction and the added component of positive reinforcement might be more successful than when the interventions are conducted independently of each other. This claim may support the Athens and
Volmer (2010) study that evaluated presenting multiple reinforcement components in favor of desired behavior.

The level of screaming stayed below baseline levels throughout the entirety of the intervention phase, and the results presented were successful in reaching the desired goal. However, the results of this study demonstrated variability. The variability in the data could be attributed to various limitations in the study.

**Limitations.** First, an AB design cannot conclude a functional relation because there are not three attempts to demonstrate a basic effect. Given that no other phase changes were conducted after the intervention phase, this design cannot guarantee that the change in screaming behavior was only because of the intervention. Many extraneous variables could have affected the participant’s displayed results including a new environment, food limitations, schedule changes, timing, and the number of opportunities per session.

The novelty of a new environment and ABA services, snacks that were sent in his lunch box that day, different peers, or adults that may have been in the room, and which toy or item the participant chose to play with that day all could have affected the results of the study. The response from other adults and peers outside the clinic to his screaming behavior could have been generalized to the clinic setting, affecting the study's outcome as well.

The participant presented with multiple food allergies limiting reinforcers to just the snacks in his lunchbox. The snacks in his lunch box may have been slightly varied or had no variation for multiple days. The inconsistency of snacks could cause satiation or lack of motivation for the snack used as reinforcement. Although it never occurred, if the participant ran out of the edible being used as reinforcement that day, the researcher could no longer conduct sessions for the day. For replication purposes, the researcher suggests that a formal preference
assessment is conducted to identify multiple highly reinforcing edibles that can be rotated throughout the sessions. Additionally, sessions should run for a pre-determined amount of time. This could reduce the limitation of satiation from snacks and varying lengths of time for each session.

One of the most significant limitations of this study was time. Both the participant and the researcher had schedule changes. Baseline sessions were typically shorter than during the intervention phase. The researcher conducted baseline during shorter ABA sessions than during the intervention phase. There was also a period between baseline and intervention where the researcher did not have the participant for approximately 3 direct ABA sessions because of schedule changes or the participant not coming to the clinic. The clinic worked on block scheduling, but sessions for this study were only able to be conducted when the researcher was providing direct therapy to the participant. If there were any callouts or cancellations, the clinic would switch therapists' schedules to other clients. When the participant and the researcher were not in direct ABA sessions together, the participant was likely working with a therapist untrained in the components of this study. The uncertainty of the schedule did not guarantee the researcher’s session with the participant and probably affected this study's experimental control.

It is also important to note that specific components of the study, such as the time between opportunities and sessions, were not timed using any device. There was also an uneven number of contrived versus natural opportunities for engagement. Most opportunities were contrived because it seemed like the toys the participant played with were not of interest to other peers, however there could have been more variables contributing to this. The clinic was mainly for children with an ASD diagnosis; some were sensitive to loud noises. The participant’s screaming could have been another variable that contributed to others not interacting with him.
The inconsistency of how often an opportunity occurred naturally or was contrived, paired with
the inconsistency of the schedule, also affected the experimental control and the comparability of
sessions/behaviors across phases of the study.

Another limitation of this study was the number of opportunities in baseline versus
intervention. In baseline, the researcher's time with the participant was shorter and inconsistent;
therefore, only three opportunities made up a single session. After a short break in continuous
sessions with the participant, the researcher's schedule with the participant was more consistent.
The researcher was working under a supervisor for this study; when asked what to do because
sessions were now longer, the supervisor instructed her that it was ok to conduct sessions with
more opportunities. However, this made it difficult to compare data between baseline and
intervention because of the differing number of opportunities. Future studies should ensure that
the opportunities per session in baseline match the opportunities per session during the
intervention, allowing for a more direct comparison of the data.

The manding behavior for proximity-based opportunities may be a limitation because
placing an open palm on the toy/item may not be a functional way to express that the participant
wanted the peer/adult to move away from him or the toy. Individually identifying the alternative
behavior for proximity-based and touch-based opportunities for future studies may result in a
more appropriate alternative behavior for each opportunity.

Lastly, the intervention may have taught the participant to mand for the edible
reinforcement and not necessarily for the item he requested. For future studies, use reinforcement
more relevant to the item he is requesting instead of a highly preferred food item that may have
sometimes been more reinforcing than the item/toy he was requesting.
For future studies, the researcher suggests demonstrating better experimental control by using a multiple baseline across settings or an ABAB design. Because this study only occurred in a clinical setting, a multiple baseline across settings would also demonstrate generalizability for the behavior. Also, future researchers should obtain information about food allergies before starting the study and talk to parents/caregivers when deciding which edibles to use, ensuring those edible reinforcers are always available. If replicated, the participant and researcher should have a stable schedule before starting, and all study components are equally comparable. The researcher also suggests conducting a functional analysis of the behavior. Hypothesizing the function of the behavior may present a limitation, given that there is a chance the function hypothesized is not correct.
References


## APPENDIX A

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<tr>
<th>Trial</th>
<th>Opportunties</th>
<th>Behavior Occurred?</th>
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