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Differential Reinforcement of Alternative Behavior in a Child With Autism

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THE CARL AND WINIFRED LEE HONORS COLLEGE
CERTIFICATE OF ORAL DEFENSE OF HONORS THESIS

Mackenzie Sullivan, having been admitted to the Carl and Winifred Lee Honors College in the spring of 2011, successfully completed the Lee Honors College Thesis on April 28, 2012.

The title of the thesis is:

Differential Reinforcement of Alternative behavior in a Child With Autism

A handwritten signature in black ink that reads "R W Malott".

Dr. Richard Malott, Psychology

A handwritten signature in blue ink that reads "Lindsay Erdman".

Ms. Lindsay Erdman, Psychology

A handwritten signature in black ink that reads "Chase Callard".

Mr. Chase Callard, Psychology

USING DIFFERENTIAL REINFORCEMENT OF ALTERNATIVE BEHAVIOR TO DECREASE AGGRESSIVE BEHAVIOR IN A CHILD WITH AUTISM

Abstract

Some children diagnosed with autism engage in aggressive behavior with different functions. There is a great need to find ways to reduce these behaviors to protect these children and make them more suitable to interact with other child in classroom settings. A Differential Reinforcement of Alternative Behavior intervention was designed in an effort to decrease aggressive behavior in child with autism. The goal of the intervention was to train Brian, the single participant, to engage in more appropriate behaviors instead of aggressing toward other children. The participant was placed in a room with another child and instances were created where Brian would normally aggress. All aggressive responses were blocked and appropriate responses were prompted. The prompts faded on as Brian progressed through phases. The results showed a significant increase in appropriate responses and a decrease in aggressive responses. This study shows that DRA procedures can be implemented to reduce aggressive behaviors.

Overview of WoodsEdge and Current DRA Studies

WoodsEdge Learning Center is special education school that provides programs for children and adults ages three to twenty-six with autism or severe cognitive and physical impairments. It aims to improve the lives of the individuals living with the disabilities and the families of these individuals. The inventive school provides an educational setting to teach individuals a variety of skills and behaviors needed to become more independent and be able to interact with the world around them. This is described in their mission and vision statement:

WoodsEdge Mission

“We are an innovative school dedicated to developing independence in our students.”

WoodsEdge Vision

“A community without barriers.”

The children attending WoodsEdge have a wide range of behavioral problems. Some children diagnosed with autism engage in aggressive behavior that may have many different functions. Possible functions of aggressive behaviors could be attention, tangible items, or escape from demands or various tasks. Another reason children would display aggressive behavior would be to avoid the loss of a reinforcer or tangible item. The aggressive behaviors may be displayed in many different forms, including hitting, shoving, kicking, biting, etc.

Different procedures are being designed to reduce these problem behaviors like aggressive tendencies of children with autism. A frequently used procedure is the Differential Reinforcement of Alternative Behavior (DRA) procedure (Athens & Vollmer, 2010). DRA usually entails withholding reinforcers when the problem behavior is displayed (extinction) and providing the reinforcer only after the appropriate behavior is exhibited (Deitz & Repp, 1983). When the reinforcer, which is maintaining the problem behavior, is now only delivered contingent on the occurrence of the alternative, appropriate behavior, this should increase the occurrence of the new appropriate behavior (Athens & Vollmer, 2010).

A few past studies have shown that DRA can be less effective when trying to decrease or extinguish problem behaviors when implemented without extinction (Volkert, Lerman, Call, & Trosclair-Lasserre, 2009). This shows that extinction is an important part of the DRA process but unfortunately, sometimes it is not possible or it is unethical to allow extinction to occur. For

example, aggressive behaviors that could harm the individual or others might have to be blocked before the behavior is admitted. Based on past studies, DRA is not as effective in lowering the frequency of problem behavior if extinction is not allowed to occur (Athens & Vollmer, 2010). For example, Fisher et al. (1993) assessed a DRA procedure using three groups: one with extinction, one without extinction, and the last with a punishment contingent on problem behavior. Out of all three groups, the group without extinction had the lowest effective rate. Only one of the three participants reached the goal of 70% reduction rate. The DRA procedure was more effective when extinction was implemented (Fisher et al., 1993).

While dealing with aggressive behavior in children with autism, it is difficult to allow extinction to occur. When a child is aggressing toward another child, the behavior is blocked. By blocking the behavior, we are not permitting extinction to transpire (Lerman & Iwata, 1996). Due to the amount of aggressive behavior seen in a particular child with autism, an intervention was designed in an effort to decrease this problem behavior. The goal of the intervention was to train Brian to engage in an alternative appropriate behavior instead of aggressing toward other children. A Differential Reinforcement of Alternative Behavior (DRA) procedure was implemented to teach alternative behaviors, such as saying “my turn” or “no thank you” instead of aggressing during play time. The participant’s aggressive behaviors were hypothesized to be maintained by access to tangible reinforcers, or as an avoidance of loss of a tangible already in his possession. The DRA procedure had to be implemented without using an extinction process due to the need to block the behavior. The current study sought to expand the existing research by examining the effectiveness of a DRA procedure without extinction on aggressive behavior.

Fall 2011-Spring 2012

Lindsay Erdmann

Lindsay Erdmann is a second year master's student that designed the Differential Reinforcement of Alternative Behavior procedure that was implemented. Lindsay implemented the procedures and took data on the subject selected for this study. She advised and guided my participation in the Behavioral Research Supervisory System (BRSS).

My Roles and Responsibilities

As an undergraduate in BRSS, I assisted Lindsay in her study. I completed weekly tasks under her direction. Some of these tasks included occasionally helping implement the sessions at WoodsEdge, graphing and coding data obtained during the sessions. I also took ABC data for another child at a different autism center. The ABC data will be used to hypothesize the function of a problem behavior.

Participant

One individual (Brian) participated in this study. Brian is three years old and has been diagnosed with autism. He is currently a student at WoodsEdge and is in an Early Childhood Special Education (ECSE) classroom. Brian is a very vocal child and has strong imitative and echoic repertoire which allows him to imitate words and phrases. These behaviors were useful when training the appropriate vocal responses. The participant engages in a moderate frequency of aggressive behavior in large social environments. These environments include playrooms or classrooms with other students present.

Methods

A Differential Reinforcement of Alternative Behavior procedure was implemented to train alternative appropriate behaviors to reduce Brian's aggressive responses. The alternative behaviors include saying "my turn" for a reinforcer and "no thank you" when keeping a reinforcer during play time. The problem behavior was monitored at all times while Brian was at WoodsEdge. Baseline data was collected in the form of ABC descriptive data. The data includes the antecedents, Brian's behavior, and the consequence from that behavior. Brian's tutors took data on all aggressive behaviors made by Brian. After analyzing this data, it was concluded that Brian's aggressive behavior was maintained by avoidance of a loss of a reinforcer or to gain access to a reinforcer.

For the procedure, a few of Brian's classmates were chosen to participate in implementing the procedure. These children will either have a preferred reinforcer in their possession, or attempt to get a preferred reinforcer from Brian. The children were chosen based on their own repertoire, such as their social skills and how likely they were to share. The peer that was chosen is very social and does well sharing with other children. The sessions were conducted in the playroom when there were no other children present, except the participants (Brian and one or two of the chosen classmates). Brian, along with the selected children, went into the designated area with some of Brian's highly preferred reinforcers (toys, tangibles, etc.). The reinforcers will be determined by a preference assessment prior to entering the play area. The procedure was divided into two conditions that were run simultaneously with each other. All attempts of aggression made by Brian were immediately blocked by tutors. Condition one included Brian's peers having possession of the reinforcers. Once Brian shows interest in the

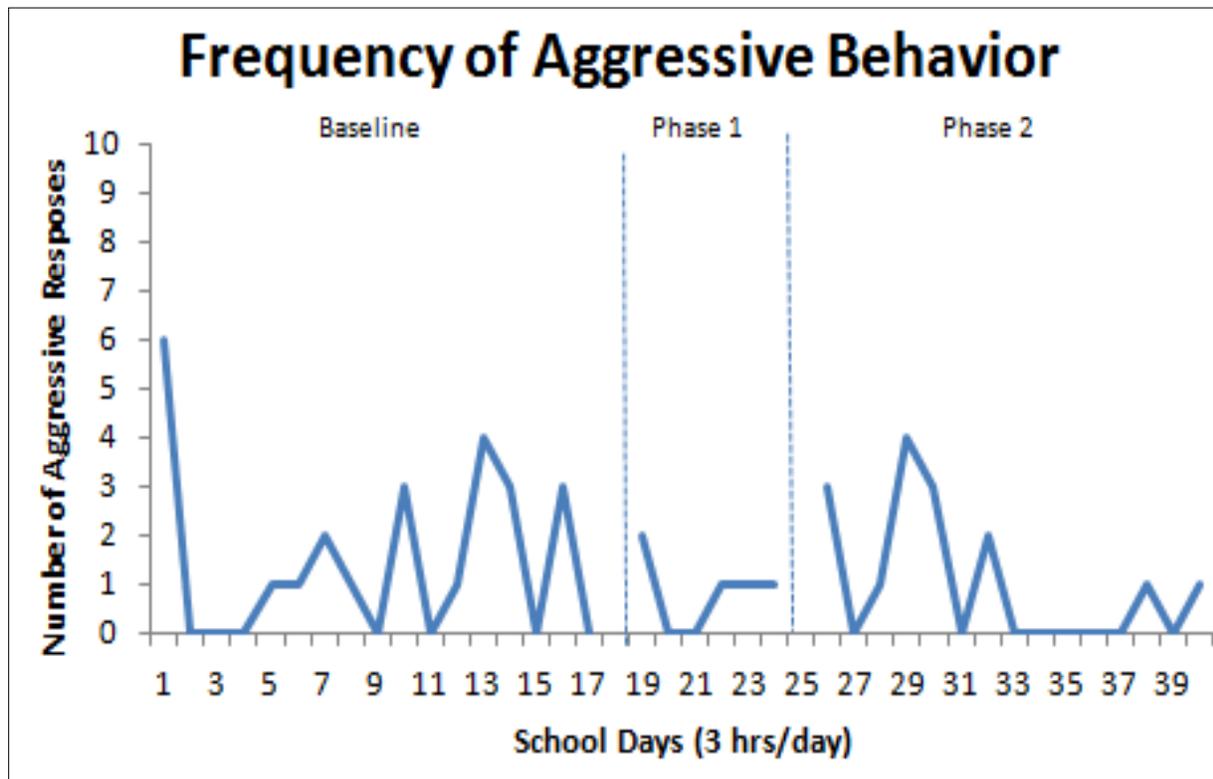
reinforcer and/or approaches the peer, or engages in aggressive behavior toward the peer, tutors prompted Brian to say “My turn.” The delay of the prompt is based on the current phase of the procedure. Phase one was an immediate prompt. The prompt was faded out across 6 phases with a maximum delay of 10 seconds. Once Brian appropriately responded, the peer is then prompted to give Brian the reinforcer immediately. Condition two included Brian had possession of the reinforcer. If his peers attempted to take the toy from Brian, the tutors prompted Brian to respond by saying “No thank you.” Again, the delay was based on the current phase of the procedure. Once Brian appropriately responded, the peer was re-directed to another reinforcer or activity immediately. Data was collected during the procedure and was coded on the data sheet. Independent responses, correct responses (independent or prompted), instances of aggression, and non responses when prompted were all recorded during the intervention.

Once Brian was appropriately responding through all phases of the procedure, the procedure was then implemented throughout Brian’s daily activities, whenever he was in a social environment. The tutors were trained to implement the procedure in the various environments in which Brian would be interacting with his peers. These sessions took place in Brian’s booth, classroom, playroom and etcetera at WoodsEdge. All attempts at aggressive behavior were blocked by the tutors. The two conditions were still present but this time they were occurring naturally. Data was collected during this procedure as descriptive A-B-C data of each inappropriate or aggressive response. For each instance of attempted aggressive behavior, the antecedent, behavior, consequence, and the level of prompt used to obtain the appropriate response was recorded. Refer to Appendix A for the full procedure.

Results

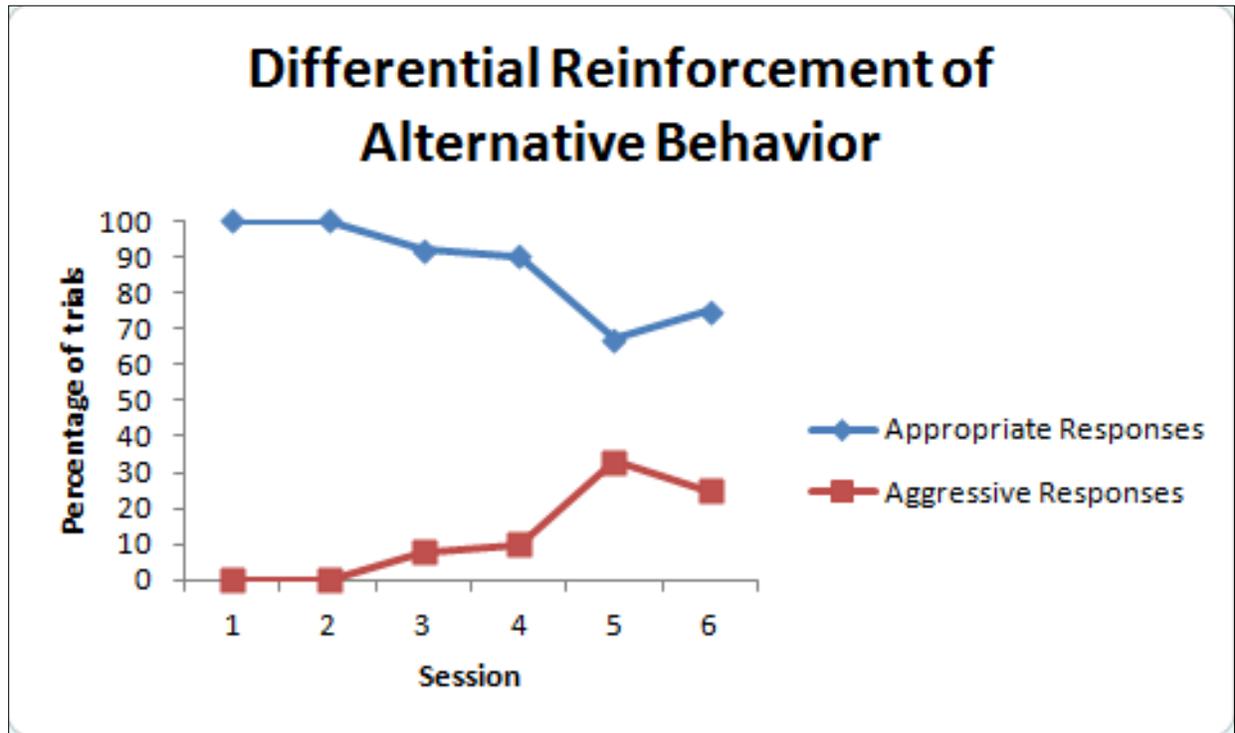
The Differential Reinforcement of Alternative behavior intervention was effective in two ways. The participant's aggressive behaviors in social environments were decreased. The appropriate vocal responses of the participant were increased.

Graph 1:



Graph 1 displays the frequency of aggressive behavior during baseline and the intervention. The frequency decreased during intervention and became stable around one aggressive behavior per day. During phase 2, there was a slight increase of aggressive behavior toward the beginning. Later, the aggressive behaviors decreased to approximately one response again.

Graph 2:



Graph 2 displays the results of the DRA procedure.

Discussion

The results showed a significant increase in appropriate responses and a decrease in aggressive responses. The goal of the study was to train alternative appropriate behaviors to reduce Brian's aggressive responses. Based on the results, this goal was achieved. Graph 1 showed a rapid decrease in aggressive behaviors during the intervention. The participant progressed quickly through each phase. Each session the participant achieved phase change criteria. The procedure was mastered within six sessions. The intervention reduced Brian's aggressive behaviors so such an extent that he was able to transition to next classroom at WoodsEdge. In the new classroom, they are continuing to take ABC data on his aggressive behavior. The aggressive behaviors are occurring at a very low frequency. Graph 2 focuses on

the intervention phase alone. The aggressive behavior decreased from baseline but in this graph, the aggressive behavior increases slightly in the last sessions. This was due to the increased time delay before a prompted appropriate response. The results were achieved by blocking Brian's inappropriate behaviors and prompting appropriate behaviors. Brian was rewarded with a reinforcer by making the appropriate response. Reinforcing correct responses helped achieve our goal. This research shows that DRA procedures can be implemented to reduce aggressive behaviors. The procedure could be implemented with more children displaying aggressive behavior. Also, this study could be used to design another DRA procedure to reduce a different problem behavior.

Conclusion

The study was successful and there are several ways in which this procedure could be used in future studies. This study will be part of the Maintenance Database so it can be found and implemented with little complications. If a child is displaying similar problem behaviors, the behaviors could be search on the Maintenance Database and this procedure will be found. The procedure could be implemented with another child to compare if similar results were achieved. Also, future studies could be implemented with more participants or with different problem behaviors to provide stronger evidence of the success of DRA.

Appendices

Appendix A:

Differential Reinforcement of Alternative Behavior to Reduce Aggression

- **Purpose:** To reduce aggressive behavior toward other children in a social environment.
- **Target Behavior:** The aggressive target behaviors mainly include hitting, pushing, and biting. The precursors to those behaviors are typically any advance toward another child who is in possession of a toy or item that is highly preferred by Brian. Another antecedent is a condition in which another child attempts to take a highly preferred item from Brian when it is already in his possession. Tutors should be aware of these antecedents when running sessions in order to effectively block any aggressive advances made by Brian.
- **For all phases:**
 - Before beginning each session, conduct a preference assessment to determine a couple highly preferred tangible reinforcers for Brian. If you get two no responses in a row during a session make sure to run an additional preference assessment to assess Brian's motivation.
 - Each session will be run in the designated area with one or two other assigned classroom children and their tutors.
 - **Both conditions will be run simultaneously**, to create a more natural exchange between Brian and his peers. Data will be collected on both conditions at the same time.
 - **Condition One:** Brian and his peers will be taken into the designated environment with Brian's preferred reinforcers (as determined by the preference assessment). **ALL attempts at aggression made by Brian will be blocked by tutors.** The other peers in the environment will be in possession of the highly preferred reinforcers. As soon as Brian shows interest in the reinforcer and/or approaches the other peer, or engages in aggressive behavior toward the peer, wait _____ seconds before prompting him to say "My turn." Tutors should then prompt the peer to give the reinforcer to Brian immediately.
 - **Condition Two:** This condition will be run simultaneously with the first condition. **ALL attempts at aggression made by Brian will be blocked by tutors.** Brian and his peers should already be in the designated environment. During this condition, Brian should have a highly preferred item in his possession. If his peers attempt to take the toy from Brian, wait _____ seconds before prompting Brian to say "No thank you." The peer should then be re-directed to another reinforcer or activity immediately.
- **Phase change criteria:** Brian may advance to the next phase of the procedure when he has 80% or more correct responses for one session.
- **Data collection:** Data should be recorded as follows:
 - In the OT column of the data sheet, code **(I)** for every independent response that Brian makes.

- Code (+) for every correct response that Brian makes. A correct response either independent or prompted responses.
- Code (-) for any instance of aggressive behavior.
- Code (**NR**) in the OT column anytime Brian makes no response when prompted.
- **Time delay for each phase:**
 - Phase One: 0 Seconds
 - Phase Two: 1 seconds
 - Phase Three: 3 seconds
 - Phase Four: 5 Seconds
 - Phase Five: 7 Seconds
 - Phase Six: 10 Seconds

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