

Reducing and Eliminating Persistent and Severe Aggression and Property Destruction
with Consistently Contingent Positive Reinforcement for Instructional Compliance and
Academic Behaviors

By
Joseph Corpa

Submitted in Partial Fulfillment of the Requirements
For the Degree of
Master of Science
in the
Applied Behavior Analysis
Program

YOUNGSTOWN STATE UNIVERSITY

May, 2016

Reducing and Eliminating Persistent and Severe Aggression and Property Destruction
with Consistently Contingent Positive Reinforcement for Instructional Compliance and
Academic Behaviors

Joseph Corpa

I hereby release this thesis to the public. I understand that this thesis will be made available from the OhioLINK ETD Center and the Maag Library Circulation Desk for public access. I also authorize the University or other individuals to make copies of this thesis as needed for scholarly research.

Signature:

Joseph Corpa, Student

Date

Approvals:

Dr. Stephen Flora, Thesis Advisor

Date

Dr. Jeffrey Coldren, Committee Member

Date

Dr. Sharon Stringer, Committee Member

Date

Dr. Salvatore A. Sanders, Dean of Graduate Studies

Date

Abstract

It is a fundamental principle in Applied Behavioral Analysis that all people have the right to receive the most effective treatment in the least restrictive environment.

Aggression and property destruction serve as barriers to further independence and social acceptability for the children in this intervention. This study examined the effectiveness

of consistent and contingent positive reinforcement for academic and appropriate

behavior at reducing property destruction and aggression in two participants identified

with ASD. The results of this intervention will be informative to future researchers,

teachers, and service providers when determining the most effective and non-aversive

method of treating problem behaviors in all clients. For one child, copious amounts of

positive reinforcement (in the form of teacher praise and edible reinforcers) contingent on

appropriate behavior, greatly reduced aggression and property destruction during work

time. Having the other child earn tokens on a fixed duration schedule and exchange his

tokens for bonus time significantly reduced aggression and property destruction

throughout the school day.

Table of Contents

Abstract.....	iii
Introduction.....	1
Method.....	4
<i>Participants</i>	5
<i>Operational Definitions</i>	5
<i>Settings</i>	7
<i>Materials</i>	7
<i>Procedure</i>	8
Results.....	13
<i>Hank</i>	13
<i>Hank Graph</i>	15
<i>Nade</i>	16
<i>Nade Graph</i>	18
Data Analysis.....	19
Discussion.....	20
Conclusion.....	24
References.....	26
Appendix A.....	28

Introduction

It is a fundamental principle in Applied Behavioral Analysis that all people have the right to receive the most effective treatment in the least restrictive environment (Houten, R.V., Axelrod, S., Bailey, J.S., Favell, J.E., Foxx, R.M., Iwata, B.A., & Lovass, 1988). The Individuals with Disabilities Education Improvement Act (IDEA) states that all children have the right to education in the least restrictive setting, as one of its six main principles. Determining what intervention method will be most effective for improving the quality of life for various clients is an important task but can be difficult. Finding the most effective treatment is a primary task for practicing Board Certified Behavior Analysts (BCBA's). Another fundamental principle for professionals in Applied Behavioral Analysis, and education overall, is to teach new skills and improve the quality of life for the people they service. But to do this "improved functioning may require the reduction or elimination of behaviors that are dangerous or that in some way serve as barriers to further independence or social acceptability" (Houten et al., 1988, p.113).

Aggression and property destruction serve as barriers to further independence and social acceptability for the children in this intervention. This study examined the effectiveness of consistent and contingent positive reinforcement for academic and appropriate behavior at reducing property destruction and aggression in two participants identified with ASD. It is a direct goal of this intervention to aid future researchers in selecting the most ethical and effective treatment for these problem behaviors.

Reinforcement of appropriate behavior "is the most important principle of behavior and a key element of most behavior change programs" (Cooper, Herron, &

Heward, 2007, p.36). The differential positive reinforcement of appropriate behavior is used to increase the likelihood that the target behavior will occur in the future and, by default, the rates of other (inappropriate) behaviors may decrease. Specifically, immediately following the occurrence of the target behavior(s) a reinforcing stimulus is presented contingent on the target behavior. In this study, differential positive reinforcement was given contingent on the occurrence of on-task and compliant behavior during academic work time and individual trial time. For one of the two children participating in this study, the primary reinforcers were attention from their teachers in the form of high fives, tickles, happy vocalizations (“good job,” “you did it” & “great work”) and fruit snacks, which were determined to be a primary reinforcer through a forced choice preference assessment for one of the children.

The second participant received conditioned reinforcers in the form of tokens, a token economy. A token economy is defined as “a behavior change system consisting of three major components: (a) a specified list of target behaviors; (b) tokens or points that participants receive for emitting the target behaviors; and (c) a menu of back up reinforcer items-preferred items, activities or privileges-that participants obtain by exchanging tokens that they earned” (Cooper, Herron, & Heward, 2007, p.560). The tokens are a neutral stimulus until they are successfully paired with teacher attention and/or access to preferred items or activities. “Stimuli that are not originally reinforcing can become reinforcers by being paired or associated with other reinforcers” (Martin & Pear, 1999, p.125).

Attention from teachers was determined to be reinforcing through informal observations during the school day and daily routine of one child and a formal Functional

Analysis conducted with the other child. Attention from teachers in the form of praise contingent on appropriate behavior has been shown to increase on task (appropriate) behavior and thereby decrease off task (inappropriate) behavior (e.g. Schute & Hopkins, 1970).

The differential positive reinforcement of appropriate behavior is considered to be one of the least restrictive forms of behavioral treatment. When providing behavior therapy treatment, “behavior analysts review and appraise the restrictiveness of procedures and always recommend the least restrictive procedures likely to be effective” (“Professional and Ethical Compliance Code for Behavioral Analysts,” n.d., p. 13). When dealing with more challenging behaviors that are targeted for reduction, specifically aggression and property destruction, more invasive treatment methods than differential positive reinforcement may be effective. However, if the least restrictive form of treatment proves to be effective at increasing appropriate behavior and therefore decreasing inappropriate behavior, even if inappropriate behaviors are not completely eliminated, moving to a more restrictive form of treatment would present several ethical issues.

Regardless, when inappropriate behaviors are dangerous to the individual themselves or others, more restrictive treatments may be necessary and have been used in the classroom setting to reduce problems behaviors that can be harmful to others. For example, timeout from positive reinforcement has been shown to be effective at reducing disruptive and destructive behavior in typical developing children and children with Autism Spectrum Disorder (ASD), across multiple settings (Donaldson & Vollmer, 2011). Timeout from positive reinforcement is defined as “the withdrawal of the

opportunity to earn positive reinforcement or the loss of access to positive reinforcers for a specified time, contingent on the occurrence of a behavior” (Cooper, Herron, & Heward, 2007, p.357). Timeout from positive reinforcement is considered “more restrictive” than differential positive reinforcement because it is a period of time when positive reinforcement is restricted from occurring.

In this study, timeout from positive reinforcement consisted of a withdrawal of teacher attention, contingent on the target behavior(s) of aggression or property destruction. When giving differential positive reinforcement for appropriate behavior, inappropriate behavior must not be positively reinforced or it will increase the likelihood that inappropriate behavior will occur in the future. We used time out from positive reinforcement in combination with differential positive reinforcement of appropriate behavior, by ignoring aggression and property destruction as much a possible, while keeping the participants and others safe, when either of the participants engaged in the target behavior(s), Even though we used timeout from positive reinforcement when ignoring inappropriate behavior, “using positive reinforcement to differentially reinforce appropriate behavior is the first and most preferred approach to increasing appropriate behavior” (Vukelich & Hake, 1971), therefore we made this preferred approach of positive reinforcement the primary focus of our intervention.

Method

Institutional Review Board (IRB): This study received approval from the IRB at Youngstown State University. The IRB evaluates any/all studies that involve living participants (human and animal) to ensure that the study is conducted while keeping the participants’ right and liberties at the forefront.

Participants

Both participants in this study will be referred to using pseudonyms. One of the participants for this study is a 14 year old adolescent male (“Hank”) identified with Autism Spectrum Disorder and Cerebral Palsy. He is able to make limited verbal requests for things that he wants. For example, he will say “open open open” if he wants you to open an item from his lunch or a door. He will say “hygiene, hygiene, hygiene” when he does not want to wait any longer to go to hygiene. He cannot read or write and has limited motor capacity when engaging in certain tasks. Since he has been a student at The Rich Center for Autism (TRC), he has displayed aggression toward his teachers, fellow students and family members. Also since being a student at TRC, he has intermittently engaged in property destruction during academic times, hindering his progress in developing new skills.

The second participant for this study is an 8 year old boy identified with ASD and bi-polar disorder (“Nade”). He is academically on grade level and has strong expressive and receptive language skills. He has engaged in aggression and property destruction for at least the 3 months he has been a student at The Rich Center for Autism (TRC). He has hit his teachers and fellow students during work time, punched the walls and flipped over desks, and used obscene language toward others in the form of threats and insults.

Operational Definitions

Aggression is defined as: any slapping, hitting (with an open or closed hand), biting, kicking, or forceful contact with any part of his body toward teachers or other students. This excludes high fives and open hand slapping on tables or other flat,

inanimate surfaces, at a rate of less than 2 slaps per second (what others may call tapping). For Nade this will include verbal threats to others and insults.

Property Destruction is defined as: any throwing, striking or pounding, (with an open or closed hand), ripping, crumpling, biting, tearing, slamming, flipping over or banging together of any classroom items during a structured task or free time. This would exclude open hand slapping on tables or other flat, inanimate surfaces, at a rate of less than 2 slaps per second.

Minimal contact restraint vs. typical restraint: A typical restraint consists of wrapping the child's arms across their chest and gripping anywhere between the wrist and elbow, usually with the teacher's chest against the student's back. To an untrained observer, this type of restraint may be considered a hug. The minimal contact restraint we used consisted of the child sitting in a chair so that the child and teacher's bodies were not in direct contact. Also the child's arms were wrapped across their chest. However, the teacher gripped the child's **wrists only**, using the minimal grip required to keep the child restrained. The purpose of the minimal contact restraint was to eliminate any reinforcing effects of the restraint, as much as possible.

Compliant Behavior: Any time the subject complies with a request or engages in behavior that is appropriate for the situation. An example would be sitting at the table during a structured group activity or raising your hand before talking out during an activity.

Partial Interval Recording: A method of recording where you mark the target behavior as having occurred in a specified interval, regardless of the number of times it

occurred. Intervals times in this study were 30 seconds for Hank and 30 minutes for Nade.

Setting

The study took place primarily in the children's classrooms and was implemented throughout their daily routine. Some work times for Hank were conducted in a different classroom with his teachers. The intervention was in place through the length of the children's school day, beginning at 9:00am and ending at 2:00pm. For Hank, observation for data collection was during his academic work time and individual trial time, when informal observations suggested that aggression and property destruction would be most likely to occur. For Nade, observation and data collection was throughout the entire school day, as informal observation suggested that aggression or property destruction was no more likely to occur during one specific time or activity than another. Therefore, larger intervals of time were used for collecting data on Nade. There was always a second teacher/staff member present in the classroom or work area.

Materials

The materials needed for this study consisted primarily of items used in daily classroom activities. We used an I-pad to record the academic and individual work time sessions for Hank. Direct observation of Nade was used to collect data throughout the school day. The activities the children were asked to complete during observation periods were the lessons they are asked to complete daily as part of their regular education curriculum.

Procedure

A partial Functional Analysis was conducted with Hank, to rule out automatic reinforcement of property destruction. This consisted of placing him in a small occupational therapy room and observing him through a one way window for a period of 3-5 minutes. He was told by his teacher that the teacher “had to go get something and would be right back.” Hank stayed in the occupational therapy room and was observed for just under three minutes. During this time, he sat in the room and looked at various items in the room. Although he would pick something up or take it back to his seat with him, he did not engage in property destruction during this time. The fact that Hank did not engage in property destruction during this observation period suggests that his property destructive behavior was not automatically reinforced but socially maintained. A full Functional Analysis was completed on Nade by the Rich Center’s Board Certified Behavior Analyst (BCBA) and determined that his target behaviors (aggression and property destruction) are maintained primarily by escape from task demands and attention from teachers. Our current hypothesis for both children was that the target behaviors are maintained by dual functions of attention from others and escape from task demands.

The next step was collecting baseline data during Hank’s academic and individual work times. Baseline data was collected on twenty six of Hank’s work time sessions. All twenty six sessions were video recorded. The video recordings were watched and data was recorded, after the actual work time sessions were concluded. We used partial interval recording to determine the percentage of intervals in which the target behaviors occurred. We also tracked the amount of time he spent in restraint, contingent on his

aggression towards his teachers and fellow students or engaging in property destruction. Furthermore, the amount of positive reinforcement given for appropriate behavior was tracked during baseline as well.

Next, the first phase of the intervention (delivering copious amounts of positive reinforcement for appropriate behavior during work time) was implemented. Twenty work time sessions were video recorded during the intervention phase. Whenever Hank engaged in appropriate behavior during work time he was given copious amounts of verbal praise from his teachers. Positive reinforcement was considered to be copious when Hank's appropriate behavior was praised each time it occurred and beyond simple recognition. During work times he was given verbal praise, high fives and tickles, his most highly preferred edible reinforcer, or he would be given a combination of verbal praise, high fives/tickles and an edible reinforcer for engaging in appropriate behavior. A simple "good job, now take a seat" was not considered copious positive reinforcement in this study.

Whenever Hank engaged in either of the target behavior(s) he was ignored, as much as possible. He was asked to clean up whatever mess he made in the room, once the work time had been completed. Hank was only restrained to the extent necessary to ensure the safety of the children and others around them. Whenever restraint was necessary, we utilized the minimal contact restraint. There were some occasions that two teachers needed to physically prompt Hank through an activity due to the intensity of his aggression; only the minimal amount of contact necessary to ensure the safety of Hank and the other students was used during these times.

Partial interval recording was used to determine the percentage of intervals in which Hank engaged in aggression, property destruction, the amount of time he was restrained and the amount of positive reinforcement given during work time. During the first phase of the intervention, aggression and destruction dropped down to very low levels. Therefore a more invasive treatment procedure was unwarranted. As a result, phase one of the intervention was the only phase that was used with Hank.

Baseline data was collected with Nade during fourteen school days. The entire school day was broken down into ten thirty minute intervals. Anytime Nade would engage in aggression or property destruction, it was recorded as occurring during the thirty minute interval, regardless of how often or how long he engaged in either of the target behaviors. Also, it was recorded if Nade was restrained during an interval or if he was given positive reinforcement during an interval.

Once baseline data was collected we implemented the first phase of the intervention (delivering copious amounts of positive reinforcement for appropriate behavior throughout the school day). However, we delivered positive reinforcement using a token economy, as opposed to verbal praise or edible reinforcers alone. Each time Nade complied with a request from a teacher, he received a token from his teacher, paired with verbal praise. Once Nade earned five tokens he was able to exchange his tokens for five minutes of “bonus time.” This was a period of time that he could request to play on a teacher’s computer, free play in the classroom, go on a walk with a teacher or any other acceptable activity. If Nade did not want to use his bonus time right away, he could save it until he was ready to do so, but he would not receive any more tokens until he used the

time he earned. If Nade would protest to an activity, his teachers would suggest that he could use his bonus time, instead of becoming aggressive or destructive.

After one day of intervention, Nade was placed in a third party treatment facility by his parents for seven days. During this time he had some drastic medication changes. When he came back to school, we took a new baseline for three days, to allow for the medication changes and see if there would be a difference in the pattern of responding recorded during the first baseline that was collected.

Once the data was collected for the second baseline, we reintroduced the token economy under the same conditions. The token economy was used for eight consecutive school days. On the ninth school day we made a change in the token economy. Previously, once Nade had earned five tokens, he had to exchange them for his five minutes of bonus time before he could earn anymore tokens. This created a problem, in that several instances of appropriate behavior were not being reinforced with tokens, just verbal praise alone, because bonus time had already been earned but not used. Now Nade could earn his five tokens and “bank” his bonus time, allowing him to earn more tokens for appropriate behavior and accrue larger periods of bonus time, which expanded the types of activities he could request to do. We ran the token economy under these conditions for six consecutive school days.

Although the token economy did not reduce aggression and property destruction to zero levels, there was a decrease in the occurrence of one of the target behaviors. Also, Nade’s verbal behavior suggested he understood the token economy system and showed interest in earning tokens daily and even requested to earn tokens for appropriate behavior at home. Keeping ethical treatment guidelines at the forefront, we only changed

the method in which the tokens were delivered, instead of moving to a more invasive treatment procedure, as was originally proposed.

While Nade had been receiving tokens on a Fixed Ratio 1(FR1) schedule (receiving one token for every one instance of appropriate behavior) for fourteen consecutive school days, he was switched to receiving them on a response duration schedule. On this schedule, a timer was set for three minutes. If Nade did not engage in inappropriate behavior for three minutes, he would earn a token when the time elapsed. If he did engage in inappropriate behavior during the length of time, the timer would be reset and would not restart until appropriate behavior had resumed. Once five tokens were earned, he could save the bonus time earned and continue to earn tokens or use it immediately.

To establish the initial duration of three minutes for the fixed duration schedule, we tracked how long Nade could independently engage in appropriate behavior, while the FR1 schedule token economy was in place. We targeted two one-hour intervals in which we would take duration data on his appropriate behavior each day and we did this for three days. Once the data was collected, it was calculated that Nade could independently engage in appropriate behavior for an average of three minutes. This was used as the starting point for his response duration schedule token economy. In order to earn five minutes of “bonus time”, Nade would have to engage in appropriate behavior for fifteen minutes (five three minute intervals, e.g. each three minutes of appropriate behavior earned a token). We kept this standard for five consecutive school days and saw a rapid decrease in the target behaviors, from previous levels. We then increased the amount of time that Nade needed to engage in appropriate behavior from fifteen minutes (five three

minute intervals) to twenty minutes (five four minute intervals). We kept this standard for eight consecutive school days and saw that Nade was continuing to exchange tokens for bonus time at high levels. Finally, we increased the amount of time that Nade had to engage in appropriate behavior from twenty minutes (five four minute intervals) to twenty five minutes (five five minute intervals).

Results

Hank

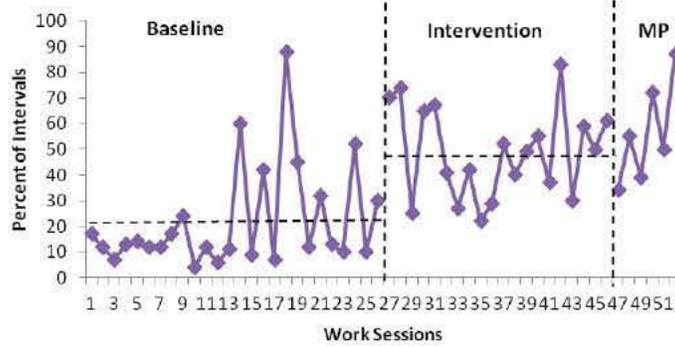
All data for this study was collected using partial interval recording and are displayed as a percentage of intervals in which the target behavior(s) occurred. During baseline conditions for Hank, the average of intervals in which aggression occurred was 14.5% and the average of intervals in which property destruction occurred was 6.5%. Hank spent an average of 16.1% of the intervals recorded in restraint and the average of intervals in which positive reinforcement for appropriate behavior was observed was 22%.

Once intervention was introduced the average of which aggression was observed dropped to 4.4% of the intervals recorded and the average of intervals in which property destruction occurred dropped to 3%. The average occurrence of both target behaviors was reduced by more than half, when copious amounts of positive reinforcement were given contingent upon appropriate behavior. Also during intervention, the average amount of time that Hank spent in restraint was reduced 4.5% of the intervals recorded and the average of intervals in which positive reinforcement for appropriate behavior was observed increased to 50.5%.

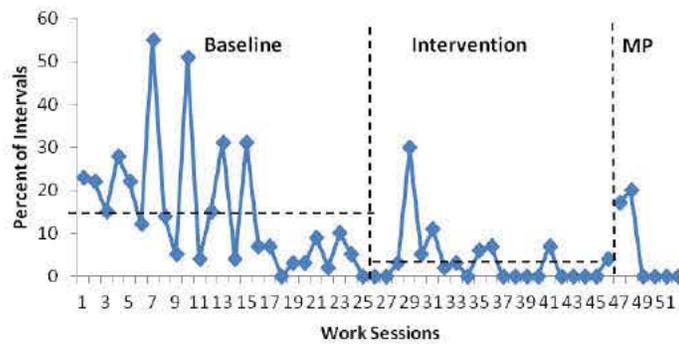
For Hank, the last part of the intervention phase was conducting six maintenance probes, to ensure that aggression and property destruction remained at low rates and that positive reinforcement was being given in copious amounts whenever appropriate behavior occurred. I went into the classroom on six random, nonconsecutive days and observed the Hank's work times. The first maintenance probe revealed that the amount of positive reinforcement being given to Hank had decreased from previous levels and aggression and property destruction had increased. After giving feedback to the teachers working with Hank, the amount of positive reinforcement given began to increase and property destruction dropped to a 0 rate of occurrence. Aggression dropped to a 0 rate of occurrence after the second maintenance probe.

The percentage of interobserver agreement (IOA) was determined to be 74%. This was calculated by taking the total number of agreements and dividing it by the total number of intervals (agreements + disagreements). A second observer, who was not in the classroom daily, watched 6 videos and recorded the amount of intervals in which aggression, property destruction and restraint occurred. The amount of positive reinforcement given to Hank from his teachers was also recorded. An agreement was determined when both the primary researcher (Corpa) and the second observer (Flora) marked the intervals as the same. IOA was taken for 8% of the total work time sessions.

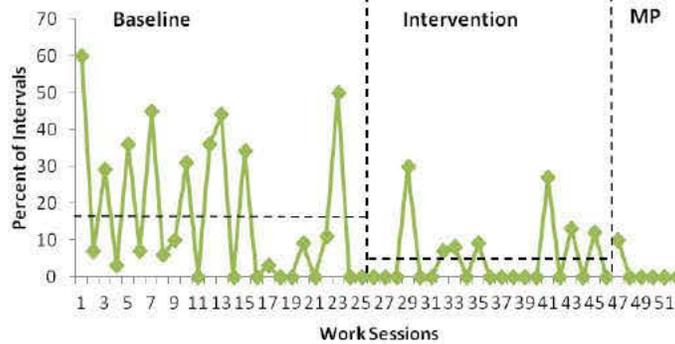
Positive Reinforcement (Hank)



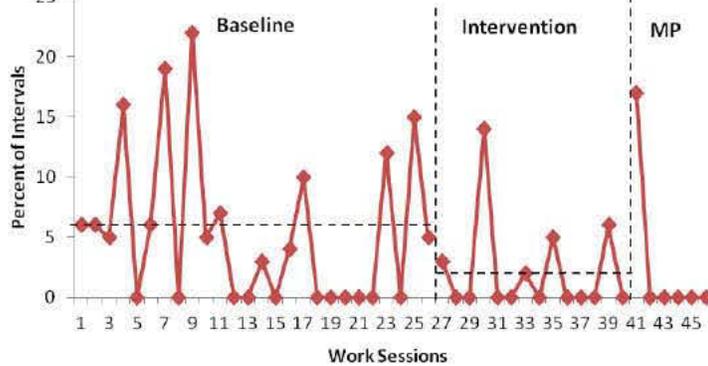
Aggression (Hank)



Restraint (Hank)



Property Destruction (Hank)



All four figures show the baseline phase, intervention phase and the maintenance probes (MP).

Nade

During baseline conditions for Nade, the average of intervals in which aggression occurred was 23.8% and the average of intervals in which property destruction occurred was 26.8%. Nade spent an average of 15.6% of the intervals recorded in restraint and the average of intervals in which positive reinforcement for appropriate behavior was observed was 54.8%. The amount of positive reinforcement that Nade received for appropriate behavior, in the form of praise from his teachers, was only tracked during the baseline condition.

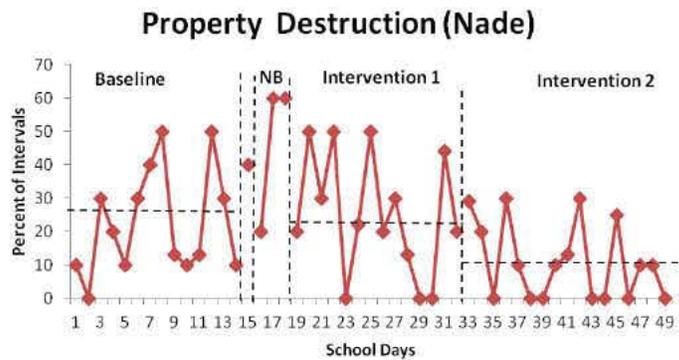
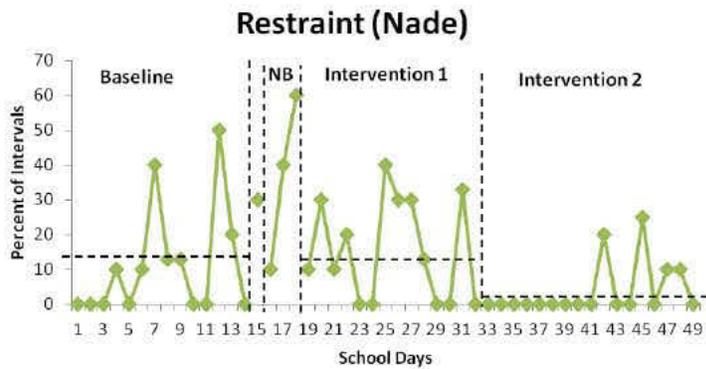
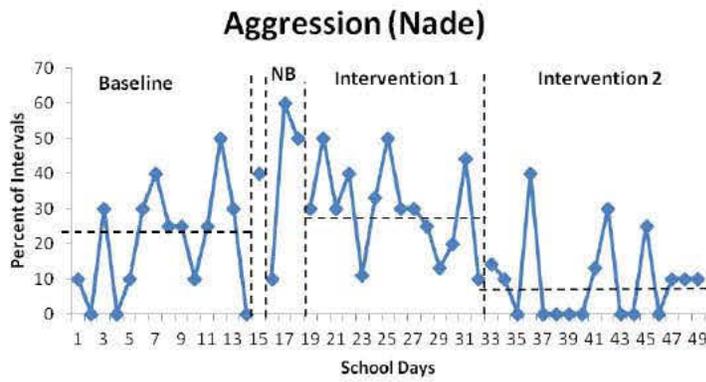
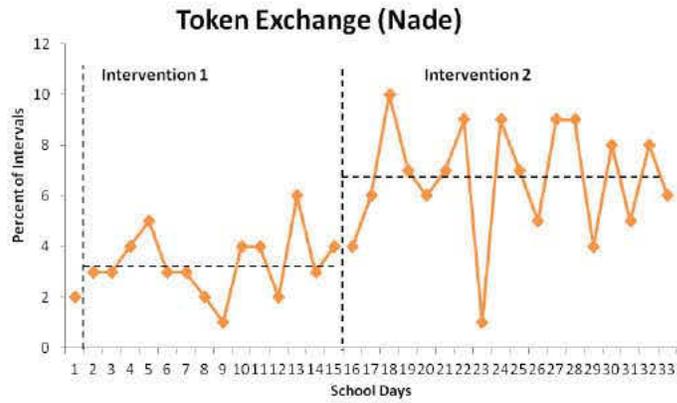
During the first intervention phase, the average of intervals in which aggression was observed actually increased to 29.7%. Although the percentage of intervals in which aggression was observed increased, Nade's teachers reported a decrease in the intensity and duration of his aggressive episodes. As data was not taken on duration and intensity, this observation was subjective (see discussion section). The average of intervals in which property destruction was observed showed a small decrease to 24.9%. The average of intervals that Nade spent in restraint remained almost unchanged at 15.4%. The average number of times that Nade would exchange tokens for bonus time was 3.4 times per day. As the token economy was the primary intervention, the amount of times tokens were exchanged for bonus time was tracked during the intervention phase instead of amount of positive reinforcement received from teachers.

During the second intervention phase, the average of intervals in which aggression was observed decreased greatly to 9.5% and the average of intervals in which property destruction was observed also had a large decrease to 11%. Both target behaviors decreased by more than 50% during the second phase of the intervention. The

average percentage of intervals in which Nade spent in restraint decreased to 3.8% and the average amount of times that Nade would exchange tokens for bonus time doubled to 6.8 times per day.

For Nade's observations, the percentage of IOA was determined to be 78%. This was calculated by taking the total number of agreements and dividing it by the total number of intervals (agreements + disagreements). IOA data was taken by another teacher who was present in the classroom each day with Nade. There were two other teachers in the classroom with Nade at all times; both of them were trained on how to take IOA data. An agreement was determined when both the primary researcher and the second observer marked the same target behavior(s) as occurring or not occurring during an interval. IOA was taken on 27% of the total intervals in which either of the intervention phases were in place.

There were a total of 91 observed intervals where IOA was taken, 71 intervals were agreements and 20 intervals were disagreements. Of the 20 intervals where there was a disagreement, 11 showed a partial agreement. More specifically, one observer noted one of the target behaviors as occurring and the other observer noted the other target behavior as occurring. The percentage of IOA that combines total agreement and partial agreement was 90%. There were only 9 intervals where both observers were in complete disagreement. A complete disagreement counted as one observer recording that one or both target behavior(s) occurred during an interval and the other recording that none of the target behavior(s) occurred during the interval.



The top three figures show baseline, intervention, new baseline (NB), intervention 1 and intervention two.

The bottom figure shows intervention 1 and intervention 2 only.

Data Analysis

Once all phases of the intervention were completed the data was analyzed, via graphic analysis, to determine the effectiveness with each participant at reducing the target behaviors. Graphic Analysis used the guidelines identified by Martin & Pear (1999):

There are seven commonly used guidelines for inspecting data to judge whether or not the treatment had an effect on the dependent variable. There is greater confidence that an effect has been observed the greater the number of times that it is replicated, the fewer the overlapping points between baseline and treatment phases, the sooner the effect is observed following the introduction of the treatment, the larger the effect in comparison to baseline, the more precisely the treatment procedures are specified, the more reliable the response measures, and the more consistent the findings with existing data and accepted behavioral theory (p.280-281).

Based on these criteria, the intervention with Hank (giving copious amounts of positive reinforcement contingent on appropriate behavior) produced a clinically significant reduction in property destruction, aggression and the amount of time Hank spent in restraint. For Nade, the second intervention (providing tokens for appropriate behavior on a fixed duration schedule) produced a clinically significant reduction in property destruction and aggression and reduced the amount of time Nade spent in restraint to near zero levels.

Discussion

On the fourth day of intervention, there was a staffing change and I was no longer the primary teacher assigned to Hank. I trained the new staff member on how to implement the intervention and provided feedback throughout the remainder of the intervention. During the maintenance probes, there was yet a third staff member assigned to work with Hank. She was trained on how to implement the intervention and provided with performance feedback as well.

Although unplanned, the number of staffing changes throughout the intervention demonstrates that the intervention (providing copious amounts of positive reinforcement contingent on appropriate behavior), if implemented correctly and consistently, will generalize across teachers, to reduce aggression and property destruction. Also, having work times conducted in one classroom for group instruction and in the student's primary classroom for individual instruction, suggests that the intervention generalized across different settings. It would be beneficial for future researchers to test for generality across settings with a larger variety of environments introduced systematically.

Generality of behavior change is one of the seven defining characteristics of behavior analysis (Cooper, Herron, & Heward, 2007, p.615). An intervention's usefulness will increase if it can be shown to generalize across subjects, settings, people, behaviors or time. The intervention implemented with Hank showed the ability to generalize across people and settings. "Applied behavior analysts face no more challenging or important task than that of designing, implementing, and evaluating interventions that produce generalized outcomes" (Cooper, Herron, & Heward, 2007, p.615).

Partial interval recording as the primary method to record data on the target behaviors resulted in a number of limitations. For both participants, partial interval recording could not account for the intensity or the duration of aggression or property destruction. For Hank, each interval was only thirty seconds long and data was only recorded during work times, so it gave a more accurate illustration of how often aggression and property destruction occurred, but was still limited. For example, positive reinforcement could occur one time in 30 seconds or six times, but would only be recorded as occurring. For Nade, each interval was thirty minutes long and data was tracked throughout the entire school day, further limiting the “capture” of behavior as data.

Partial interval recording for the entire school day, with 30 minute intervals, was used with Nade out of practicality and keeping expectations realistic. Nade’s classroom was broken down into three small rooms, which were all used at some time throughout the day and the children could move through them with almost no restriction. For example, if an aggressive episode began in one room and carried on into another, the teacher would not have been able to consistently and realistically ensure that a recording device was in the proper place at all times. This is why direct observation in real time was chosen to be the primary method of recording. Also, formal observation by the Rich Center’s BCBA and informal observation of the teachers in the classroom could not identify one time of day that the target behavior(s) were more likely to occur than another. For these reasons, direct observation in real time was conducted and data was recorded for the length of the school day.

The length of the intervals and the observation period for Nade did not allow for appropriate differentiation between an extended aggressive or destructive episode and single occurrences of aggression or destruction. For example, if Nade was aggressive for a constant one and a half hours (three consecutive intervals), it would show that he was aggressive for 30% of the intervals recorded. If on a different day he kicked his teacher in the shin, just once, on three separate occasions, during three separate intervals, the data would show that he was aggressive for 30% of the intervals recorded. The data would show that he was “equally” aggressive on both days, when in fact he was not. Future researchers would benefit from using significantly shorter intervals and having a permanent product to refer to, such as video recording, for data collection.

For Nade we were able to compare how effectively two different methods of implementing a token economy worked in the classroom environment. The first (more traditional) method of delivering a token upon each instance of appropriate behavior did not show dramatic reductions in the target behaviors. Although Nade understood the concept and seemed to enjoy earning tokens throughout the day, notable decreases in aggression and property destruction were not seen and Nade still needed more restrictive, one on one, supervision throughout the day. I had been informed that previous attempts to implement token economies in this manner resulted in Nade ripping them up or throwing them away. However, this did not occur in the present study.

However, delivering tokens on a response duration schedule (the second intervention) decreased the target behaviors to levels that seemed to allow Nade to more smoothly transition through the school day, requiring less restrictive one on one attention. Delivering tokens in this manner not only reduced aggression and property destruction,

but increased appropriate behavior throughout the school day. Differentially reinforcing all other behavior but aggression and property destruction (DRO) or using time out from positive reinforcement alone, would not have provided Nade with an appropriate functional alternative (appropriate behavior) to get what he wanted.

Delivering tokens for specified durations of appropriate behavior allowed Nade to escape non-preferred activities and get teacher attention with appropriate behavior. Previously, if Nade was asked to participate in an activity that he did not prefer/enjoy, he would engage in aggression or property destruction which would provide him with escape from the un-preferred activity. In many cases his aggression and property destruction would result in him being removed from the group and working one on one with a teacher, providing him with extended individualized attention from his teachers. Now, Nade may not participate in certain activities throughout the school day, but he is doing so as a result of earning tokens for engaging in appropriate behavior earlier in the day and exchanging them for bonus time. Aggression and property destruction no longer have the same reinforcing qualities as they did in the past, since they no longer result in removal of the task demand but instead, prevented him from earning tokens toward bonus time.

During baseline conditions and throughout both intervention phases, Nade went through several medication changes. For the first medication change there was a return to baseline conditions after one day of intervention, to account for any changes in behavior as a result of the medication. However, there were at least two other medication changes during the intervention phases, but no return to baseline conditions. It was not realistic or ethical to return to baseline conditions with each medication change, as that would have

meant stopping the use of the token economy, which not only did Nade seem to enjoy, but was highly effective during the second intervention phase. Furthermore, the medication changes were unpredictable, so there was no objective way to account for them in the data.

Although the experimental design was set up in such a manner that the data may not have given the clearest illustration of the target behavior(s) progression, it was still the best and only possible method given the reality of the environments and it was valuable. In terms of setting goals for athletes, it has been noted that while certain designs may limit experimental control they enhance the ecological value because they were used in the actual settings that they were designed for (Ward, 2011, p. 102). This intervention may have been limited by its lack of control of extraneous variables and recording method, but it was used in the classroom setting in real time, which may have more practical application.

Conclusion

Giving Hank copious amounts positive reinforcement (in the form of teacher praise and edible reinforcers) contingent on appropriate behavior, greatly reduced aggression and property destruction during work time. This intervention generalized across people and settings and was the least invasive of the three methods originally proposed.

Having Nade earn tokens on a fixed duration schedule and exchange his tokens for bonus time significantly reduced aggression and property destruction throughout the school day. This intervention also provided a functional alternative for getting teacher

attention and escaping un-preferred activities. This intervention was the least invasive of the three originally proposed.

Therefore, it would have been unethical to progress to the other proposed methods solely for research purposes. The results of this intervention will be informative to future researchers, teachers, and service providers when determining the most effective and non-aversive method of treating problem behaviors in all clients.

References

- Axelrod, S., Brantner, J.P., & Meddock, T.D. (1978). Overcorrection: A review and critical analysis. *The Journal of Special Education, 12*(4), 367-379.
- BACB Board of Directors. (2014, August 7). *Professional and Ethical Compliance Code for Behavioral Analysts*. Retrieved from <http://bacb.com/wp-content/uploads/2016/03/160321-compliance-code-english.pdf>. (p. 13).
- Brantner J. P. & Doherty M. A. (1983). A review of timeout: A conceptual and methodological analysis. In S. Axelrod & J. Apsche (Eds.). *The effects of punishment on human behavior*. (pp. 87–132). New York, NY: Academic Press.
- Cooper, J.O., Heron T.E., & Heward, W.L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, N J: Pearson Education Inc.
- Daniels A.C., & Bailey J.S. (2014). *Performance Management: Changing behavior that drives organizational effectiveness* (5th ed.). Atlanta, GA: Aubrey Daniels International, Inc.
- Donaldson J. M. & Vollmer T. R. (2011). An evaluation and comparison of time-out procedures with and without release contingencies. *Journal of Applied Behavior Analysis, 44*, 693–705.
- Freeman, B.J., Graham, V., & Ritvo, E.R. (1975). Reduction of self-destructive behavior by overcorrection. *Psychological Behavior, 37*, 446.
- Houten, R.V., Axelrod, S., Bailey, J.S., Favell, J.E., Foxx, R.M., Iwata, B.A., & Lovass, O.I. (1988). The Right to Effective Behavioral Treatment. *Journal of Applied Behavior Analysis, 21* (4), 381-384.
- Individuals with Disabilities Education Improvement Act, 108th Congress, Public Law 108-446. Page 118, Stat 2647. (2004).

- Johnson, W.L., Baumeister, A.A., Penland, M.J., & Inwald, C. (1982). Experimental analysis of self injurious, stereotypic, and collateral behavior of retarded persons: effects of overcorrection and reinforcement of alternate responding. *Analysis and Intervention in Developmental Disabilities*, 2, 41-66.
- MacKenzie-Keating, S.E. & McDonald, L. (1990). Overcorrection: Reviewed, revisited and revised. *The Behavior Analyst*, 13, 39-48.
- Martin, G., & Pear, J. (1999). *Behavior Modification: What it is and how to do it* (6th ed.). Upper Saddle River, NJ: Prentice Hall, Inc.
- Ollendick, T.H., & Matson, J.L. (1978). Overcorrection: An overview. *Behavior Therapy*, 9, 830-842.
- Piazza, C.C., Fisher, W.W., & Hanley, G.P. (1977). The use of positive and negative reinforcement in the treatment of escape-maintained destructive behavior. *Journal of Applied Behavioral Analysis*, 30, 279-298.
- Schutte, R.C., & Hopkins, B.L. (1970). The effects of teacher attention on following instructions in a kindergarten class. *Journal of Applied Behavior Analysis*, Summer, 3(2), 117-122.
- Vukelich, R., & Hake, D.F. (1971). Reduction of dangerously aggressive behavior in a severely retarded resident through a combination of positive reinforcement procedures. *Journal of Applied Behavioral Analysis*, 4(3), 215-225.
- Ward, P. (2011). *Behavioral Sport Psychology*. Luiselli, J.K., & Reed D.D. (Eds.). New York, NY: Springer.
- White, G.D., Neilson, G., & Johnson, S.M. (1972). Timeout duration and the suppression of deviant behavior in children. *Journal of Applied Behavioral Analysis*, 5(2), 111-120.

Appendix A

Youngstown
STATE UNIVERSITY

One University Plaza, Youngstown, Ohio 44555
Office of Grants and Sponsored Programs
330.941.2377
www.ysu.edu

November 5, 2015

Dr. Stephen Flora, Principal Investigator
Mr. Joseph Corpa, Co-investigator
Department of Psychology
UNIVERSITY

RE: HSRC PROTOCOL NUMBER: 015-2016
PROTOCOL TITLE: Comparing the Effectiveness of Using Positive Reinforcement,
Response Cost, and Overcorrection to Reduce/Eliminate
Destruction of Property by a Child with ASD

Dear Dr. Flora and Mr. Corpa:

The Institutional Review Board of Youngstown State University has reviewed the above mentioned protocol and determined that it fully meets YSU Human Subjects Research Guidelines. Therefore, I am pleased to inform you that your project has been fully approved for one year. You must submit a Continuing Review Form and have your project approved by November 4, 2015, if your project continues beyond one year.

Any changes in your research activity should be promptly reported to the Institutional Review Board and may not be initiated without IRB approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the IRB.

Sincerely,



Michael A. Hripko
Associate Vice President for Research
Authorized Institutional Official

MAH:cc

c: Dr. Jeffrey Coldren, Chair
Department of Psychology

Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.ysu.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

