

Increasing Sitting Tolerance for a Child with Autism Spectrum Disorder Using Positive Reinforcement, Negative Reinforcement, and Overcorrection Positive Practice

Heather Corey, M.A., BCBA, Rachel Borgatti, M.A., BCBA, Jaime Deacon M.A., BCBA, Yoanna V. Vaughan M.A., BCBA

The researcher applied positive and negative reinforcement procedures with overcorrection positive practice in order to analyze the effects on the duration of sitting for a child with autism spectrum disorder (ASD) upon the request of an adult. Once steady state responding occurred for each target duration the procedure was replicated using a changing criterion design, gradually increasing the target duration over 5 weeks from 30 to 110 seconds. These findings are significant for future applications to increase tolerance duration, but may have limitations for consistent responding.

Keywords: Positive reinforcement, negative reinforcement, overcorrection positive practice, changing criterion design, autism

Literature Review

The use of escape, or negative reinforcement, has been an effective treatment for changing behavior. Powers and Thorwarth (1985) used negative reinforcement to increase the tolerance of physical contact for a preschooler with ASD. Researchers effectively demonstrated the use of negative reinforcement to increase the participant's ability to sit in the trainer's lap. When the child met the target duration of sitting in the trainer's lap without crying, he was given a 30-second break, during which the trainer did not interact with the participant. Target durations for sitting were slowly increased over time utilizing a changing criterion design. When responding was stable for three consecutive sessions, the trainer increased the target duration.

To decrease the frequency of disruptive behaviors for an adolescent with traumatic brain injury, researchers Mozzoni and Hartnedy (2000) compared the effects of three different interventions using an alternating treatment design. Interventions alternated between earned escape (negative reinforcement), contingent praise, or showing the participant their correct responses through graphic representation (e.g., tallies of correct responses and graphs of progress). Frequency data was taken on a variety of disruptive behaviors including hitting and touching others. No formal functional assessment was conducted prior to treatment conditions. Treatments alternated in random order and were 10 minutes each. Pre-teaching was used before each session to prompt appropriate behaviors such as hand-raising. When the participant did not comply, he was provided verbal or physical prompts. During the graphic representation treatment, the therapist took frequency data on the participant's correct responses, and then showed him the progress he made through cumulative graphs. During the praise condition, the participant was praised every 10 seconds if he was sitting and demonstrating on-task behavior. The escape condition provided the participant with contingent breaks after a predetermined duration. At first, there was a decrease in behaviors during all treatment conditions. However, the escape condition continued to

consistently show decreasing disruptive behavior, while the other two conditions showed an increasing trend for disruptive behaviors. At this point it was decided that the escape condition was the most effective, so all other treatments were removed. Once the other treatments were removed, the escape condition moved to a changing criterion design, by slowly increasing the duration of time that the participant needed to be sitting and on-task before earning escape. The changing criterion design showed that the participant's disruptive behavior continued to maintain near-zero levels through the higher levels of duration.

Escape procedures have also been effective in differential reinforcement treatments. Cook, Rapp, and Schulze (2015) provided reinforcement in the form of escape contingent on the absence of the target behaviors (e.g., yelling, flopping, hand-biting, hitting, pulling or biting the aversive stimulus, or demanding the aversive stimulus be removed) when his medical bracelet was applied. Researchers provided escape when the participant met the target duration without the target behaviors. If the participant demonstrated any of the target behaviors during a trial, the timer was stopped, and a new trial began. The researchers did not remove the bracelet until the participant met the target duration during a trial. Treatment was continued over 8 weeks, and through a changing criterion design, the researchers showed that the participant's tolerance of wearing the bracelet increased from 0 seconds to 7 hours.

In some studies, positive reinforcement and negative reinforcement have been combined to increase functional behaviors for children. Schumacher (2011) combined positive and negative reinforcement to increase the duration that a child with ASD would tolerate a haircut. Prior to the treatment, the mother was cutting the child's hair while he was sleeping or taking a bath, and on some occasions, while the father restrained him. During the procedure, the participant was cued to sit in the chair. When he tolerated sitting and having his hair cut for the target time, the participant was given a preferred edible and a 30-second break. After the break, the participant returned to the chair for the next trial. The initial target duration was 5 seconds, which was approximately half of the baseline mean (before the subject left the chair). Each target duration was repeated for several trials, and was systematically increased until the criterion target duration was met, which was 5 minutes. The participant was never blocked from leaving the chair. Results showed that positive reinforcement combined with negative reinforcement effectively increased the participant's ability to sit for a haircut.

In a similar treatment, researchers provided escape and access to a preferred activity contingent on engagement in work activities and the absence of maladaptive behaviors (Reichle, Johnson, Monn, & Harris, 2010). The purpose was to increase the participants' tolerance of delayed reinforcement when either delay cue was applied, ("almost done" versus "____ more, than ____"). Through an alternating treatment design with an increasing change in duration criterion, both participants demonstrated an increase in task engagement and a decrease in maladaptive behaviors.

Ricciardi, Luiselli, and Camare (2006) used positive reinforcement to increase an 8-year-old boy's approach-responses to electronic toys and lights, without screaming, hitting, or crying. The boy was diagnosed with an autism spectrum disorder and demonstrated intense screaming, crying, and fleeing behaviors in response to seeing electronic toys and lights in the community (i.e., electronic Santa, Christmas lights, etc...). The researchers provided preferred items contingent on the boy approaching the electronic item at the target distance. The boy was allowed to escape at any time. If he did not approach the toy, the preferred item would be saved for the next time interval. The researchers evaluated the

boy's responses through a changing criterion design. The researchers demonstrated a significant change in the boy approaching the toys upon the researcher's request. During baseline procedures, the boy did not move past the doorway to the room. At the end of treatment, the boy approached and touched the toy upon all of the researcher's requests. The mother reported, "that he occasionally protested these situations but tolerated the stimuli without escape," while in community settings. This supports generality to other settings and suggests socially significant improvement.

Grey, Healy, Leader, and Hayes (2009) systematically increased the participant's ability to wait for preferred items and activities using delayed positive reinforcement. To demonstrate the amount of time that the participant needed to wait, the researchers used visual cuing in the form of color-coded cards that gradually faded to a visual timer. When the participant met the target duration without behaviors to decrease, the researchers provided access to the preferred items. The changing criterion design showed that the participant's tolerance of waiting increased from 1 second to 10 minutes.

Research in applied behavior analysis (ABA) is showing effective application of overcorrection procedures to treat problem behaviors (Miltenberger & Fuqua, 1981). With overcorrection positive practice procedures the, "individual is required to practice appropriate forms of responding, contingent upon observed instances of the inappropriate behavior, (Carey & Bucher, 1983). Carey and Bucher compared the effects of overcorrection positive practice on decreasing off-task behavior, as well as the effects of positive practice implemented in 3-minute durations versus 30-second durations. When participants demonstrated off-task behaviors while completing activities such as putting coins in slots, the researchers physically prompted the participant for the required duration according to that condition (3 minutes versus 30 seconds). Results suggested that overcorrection positive practice had a significant effect in decreasing the participants' off-tasks behaviors. It should also be noted that the researchers indicated that shorter durations were just as effective as longer durations in reducing off-task behaviors.

The purpose of this study was to demonstrate the effects of the independent variable, positive and negative reinforcement combined with overcorrection positive practice, on the dependent variable, the participant's ability to sit upon the request of an adult, for increasingly longer durations within a changing criterion design.

Method

Participant

The participant was a 2-year-old diagnosed with ASD who was referred by the mother to a local family services agency for concerns primarily with communication. The participant was evaluated by that local agency using the *Infant-Toddler Developmental Assessment* (Provence, Erikson, Vater, & Palmeri, 1995). Several different developmental areas were assessed. Areas that were relevant to this study were: Language and communication, self-help, and emotions and feelings states. The agency reported that the participant demonstrated a delay in communication by 13 to 15.5 months. In the area of self-help, it was reported that, "[The participant] has a hard time sitting for meals, staying for only a short time in his chair." In the area of emotions and feeling states the agency reported that the participant will, "Sometimes hit his mother when he doesn't get his way," and, "Will show anger and frustration by yelling."

The participant was then referred to a local agency specializing in applied behavior analysis (ABA). The purpose of this referral was to support the family in improving goals in communication, play, and with following directions such as sitting upon request. At the time of the study, the agency observed that the participant demonstrated preferences for listening to books, looking at computers or televisions, and playing with his bowling game. The participant was chosen for this study based on the family's wish to increase his ability to sit with them and eat for longer durations, as well as to begin toilet training. Consent to participate in the study was obtained prior to the procedures.

Setting

The participant received ABA services in the home 5 days a week, 3 hours a day. Services included direct service from a graduate student at a local college, who was employed as an autism interventionist at the ABA agency. Consultation, analysis, and generalization hours were also provided by the Board Certified Behavior Analyst (BCBA) who was contracted to manage the case. The study took place in the participant's home within the playroom, kitchen, living room, the participant's bedroom, and hallways.

Functional Assessment

The researcher conducted informal interviews with the family, performed direct observations, and analyzed information from several reports in order to determine the function of the participant's behaviors to decrease (see operational definitions). Through interviews with the parents, it was reported that when the participant was put in his high chair or asked to sit with the family, that the participant would move to leave the area, or would not come to sit at all. When the family tried to hold the participant to have him comply with sitting, any of the following behaviors would occur: Vocal protest, aggression, and/or self-hitting (see operational definitions). The parents reported feeling frustrated and also reported that they fed the participant by either following him around the house or allowing him to stand in the living room in front of the couch while he watched videos on his electronic device. The ABA agency administered The Scales of Independent Behavior-Revised (SIB-R), a standardized test, with the family to identify the participant's adaptive and maladaptive behaviors. The family identified the participant's uncooperative behavior (not following directions) as the most concerning behavior. The family identified this as being a serious and critical problem, since follow-through would often lead to the participant hurting himself. Short observations were also conducted by the researcher and the BCBA, which included recording the setting events, antecedents, behaviors, and consequences of when the participant was asked to sit. Any time that the participant was physically prevented from leaving the area, behaviors to decrease occurred. Based on the analysis of the reports from the local agency, the SIB-R, interviews with the family, and direct observations, it was concluded that the hypothesized function of the participant's behaviors to decrease was escape.

Operational Definitions

Sitting tolerance was defined as: Any duration the participant sat on his bottom within a response latency of no longer than 10 seconds of a request to sit down from an adult without displaying behaviors to decrease (i.e., vocal protest,

aggression, and/or self-hitting). Example: Participant sat on the couch for 5 minutes while completing puzzles and having access to a preferred item. Non-example: Participant sat at the table with his bottom on a chair while self-hitting.

Vocal protest was defined as exhibiting vocalizations above normal speaking volume and paired with tears or crying sounds for 10 or more consecutive seconds. An episode was over when the participant refrained from exhibiting any of the above behaviors for 10 consecutive seconds.

Self-hitting was defined as the participant using an open or closed fist to hit his body or face. An episode was over when he refrained from hitting himself for 5 consecutive seconds.

Aggression was defined as the participant contacting another person's body with force with his hands or feet; biting (contacting another person's body with his teeth); pulling hair; grabbing (i.e. pulling at another person's body/clothing, or pulling an object someone else is holding). An episode was over when he refrained from these behaviors for 5 consecutive seconds.

Definitions and protocols for self-hit and aggression were part of the treatment descriptions, based on behaviors occurring prior to the beginning of the study. However, it should be noted that neither self-hits or aggression occurred during treatment.

Data Collection

During baseline, the researcher collected data on the duration that the participant engaged in sitting upon the request of an adult without preferred materials, (see Appendices A and C). If the participant did not sit during the trial within 10 seconds of the request, "0" was recorded as the duration for that trial. Digital timers were used to record duration.

During the treatment procedures, the researcher recorded a "+" if the participant met the target duration. The researcher recorded a "-" if the participant did not meet the target duration. The actual duration of sitting without behavior to decrease was recorded, excluding the time after the target duration was met (see Appendix B). This was due to treatment protocol which included negative reinforcement, in which attention and prompting for play engagement were removed at the end of the duration, to increase the likelihood that the participant would sit for the target duration again. Therefore, any duration of sitting after the target duration was met was not included, for it did not contain the same contingencies as the sitting trial, which was sitting upon the request of an adult. Digital timers were used to record duration. After the first trial for the 70-second target occurred (target 5), no services were provided for 7 days. During this time, the participant was on vacation, no treatment occurred, and no data was collected.

Preference Assessment

Prior to the study, a list of preferred items (Appendix C) was collected utilizing a free operant preference assessment, during which the participant was allowed to freely select items from a field of three. A preferred item was defined as any item that the participant selected and engaged with for at least 1 minute when provided free access on three separate occasions.

Baseline Procedure

Baseline trials were conducted across the following settings in the home playroom, living room, the participant's bedroom, kitchen, and hallways. The researchers set up a variety of play materials that excluded those that were determined to be preferred. The discriminative stimulus was the vocal direction, "Time to sit," paired immediately with a visual representation on the participant's schedule. If the participant did not sit within 10 seconds of the discriminative stimulus, the researcher stated, "Okay. We'll try again later." If the participant complied with sitting within 10 seconds of the discriminative stimulus, the researcher used prompting (gesture, hand on forearm, verbal or model) to engage the participant in play activities. During sitting trials, the researcher prompted the, "All done," sign (see Appendix A), within 1 second of the participant's bottom leaving the surface. This was done to continue to increase opportunities to teach the participant appropriate communication.

Research Design

The researcher evaluated the effects of treatment utilizing a changing criterion design. Cooper, Heron, and Heward (2007) define changing criterion design as, "An experimental design in which an initial baseline phase is followed by a series of treatment phases consisting of successive and gradually changing criteria for reinforcement or punishment. Experimental control is evidenced by the extent the level of responding changes to conform to each new criterion, (p. 691-692)." An initial target criterion, 30 seconds, was selected by calculating the mean duration of sitting during baseline, and then dividing by approximately half of the mean. It was predicted that a shorter target duration would initially motivate the participant to sit and expose him to reinforcement faster, thereby decreasing the likelihood of practicing errors. This replicated the strategy for determining the initial target criterion in Schumacher, 2011.

When the participant met the target criterion across three consecutive trials, showing steady state responding, the procedure was then replicated using a changing criterion design at a longer target duration. Trials were conducted during the participant's 3 hour ABA sessions, across multiple settings (playroom, living room, the participant's bedroom, kitchen, and hallways) in order to promote generalization within the teaching trials. One to 10 trials were conducted during one 3 hour session. The study took place over 5 weeks, excluding the time the participant was on vacation. Each criterion increased by 10 seconds once mastery criteria was acquired. Target criterion durations were selected to increase gradually after thorough discussion with the BCBA, and consideration of the participant's age and short history with ABA treatment. A goal to end treatment at a 5-minute criterion was recommended by the BCBA in order to begin fading treatment. It was predicted that the 5-minute criterion would not be acquired until after the study ended. At the end of the study, the procedure was replicated 8 times. Based on the BCBA's recommendations, treatment continued past the study to achieve the 5-minute criterion.

Procedure

Prior to each trial, the trainer set up the play materials and selected one item from the preferred item list (Appendix C). The discriminative stimulus was the vocal direction, "Time to sit," paired immediately with a visual

representation on the participant's schedule. The researcher then presented the preferred item in the play area. If the participant did not sit within 10 seconds of the discriminative stimulus, the researcher stated, "Okay. We'll try again later." If the participant sat down in the play area with a response latency of no longer than 10 seconds, then the researcher provided immediate access to the preferred item, while also using prompting (gesture, hand on forearm, verbal or model) to engage the participant in play, using the other materials. If the participant complied with sitting for the target duration, an immediate break from the trainer's attention was provided. During a break, the participant was allowed to engage with non-preferred toys, his toys from home, as well as continued access with the preferred item that was used during the sitting trial. Attention and demands were removed for 5 minutes. The researcher implemented one to 10 target trials per session. If the participant exhibited vocal protest behavior at any point during the trial, or if his bottom left the surface before the target duration was met, the researcher immediately prompted the "all done" sign, then utilized overcorrection positive practice by redirecting the participant to a neutral activity using least to most prompting to complete three tasks. The following were examples of one task: 1) One puzzle piece into a board; 2) stacking one block; 3) stacking one ring onto a stacker; 4) putting one toy into a container or bag; or 5) putting one peg into a pegboard. The participant was then allowed a break from the trainer's attention and demands but no access to any items from the preferred item list.

Interobserver Data Collection

Mean duration per occurrence interobserver agreement was obtained during treatment on five separate trials. One trial utilized another staff member from the ABA agency who had 2 years of training on duration data collection. During this trial, both recorders utilized digital timers to record the duration. During the other four trials, the trainer utilized a video recording device to videotape the trial, while also recording duration on a digital timer. This required the recorder to review the videotape, noting when the trial began and finished and at what times according to the video feed. Mean duration interobserver agreement was calculated by dividing the shorter duration of one trial by the longer duration of the same trial and then repeating this process for all other trials in which interobserver agreement occurred. After calculating agreement for all interobserver trials, the sum was then calculated and then divided by the number of interobserver trials, and finally multiplied by 100. This percentage was the mean duration per occurrence interobserver agreement. Results of interobserver data were as follows: 1.0 agreement for trial 1 (with the staff member); .96 for trial 2; .93 for trial 3; 1.0 for trial 4; and .98 for trial 5. This showed a range of .93 to 1.0 agreement. After adding the sum of the agreement percentages, dividing by 5, and multiplying by 100, the mean duration per occurrence interobserver agreement was 97%.

Procedural Integrity Agreement

Procedural integrity data occurred on two occasions. One trial was recorded by another staff from the ABA agency, who was naive to the study but had 2 years of data collection and observation experience. The other trial was recorded by the BCBA who was familiar with the study. Out of 8 measures, which outlined critical steps to procedural integrity (Appendix D), both observers recorded 100% agreement with procedural integrity.

Results

Figure 1 shows significant variability in responding during baseline procedures with a slightly increasing trend line. The mean duration during baseline was 76 seconds of sitting without behaviors to decrease. There were three outliers in the data, when the participant complied with sitting for much higher durations than the other data points. It was also noted that out of 33 baseline trials, 14 of them resulted in the participant not complying with sitting at all, which was then reordered as “0” for the duration of that trial. This meant that throughout baseline, 42% of trials resulted in the participant not sitting at all.

During treatment, the participant showed immediate stable responding at the 30-second target criterion, Target 1. Each time the procedure was replicated at a higher target criterion, the responding initially dropped to “0” for several trials before stabilizing again. The 70 second target criterion, Target 5, was introduced immediately before the participant went on vacation for 7 days. Upon returning from vacation, the participant took a longer time to demonstrate stable responding when compared to the other criteria. On average, each target was acquired within five trials. Target 5, however, was acquired in 15 trials, which is 3 times more than the average for all other targets.

A total of nine phases occurred overall. A total of 56 trials occurred during treatment. The total number of trials in which “0” was recorded for duration (the participant did not sit at all), was 16. This means that the percentage of trials in which the participant did not sit at all decreased from 42% to 29%, which was a 13% decrease in not sitting at all. The total duration of sitting increased from 30 seconds to 110 seconds over nine phases. This is a total increase of 80 seconds of sitting overall, or an increase of 267%. The total duration increase from the baseline mean was 34 more seconds of sitting, or an increase of 45%.

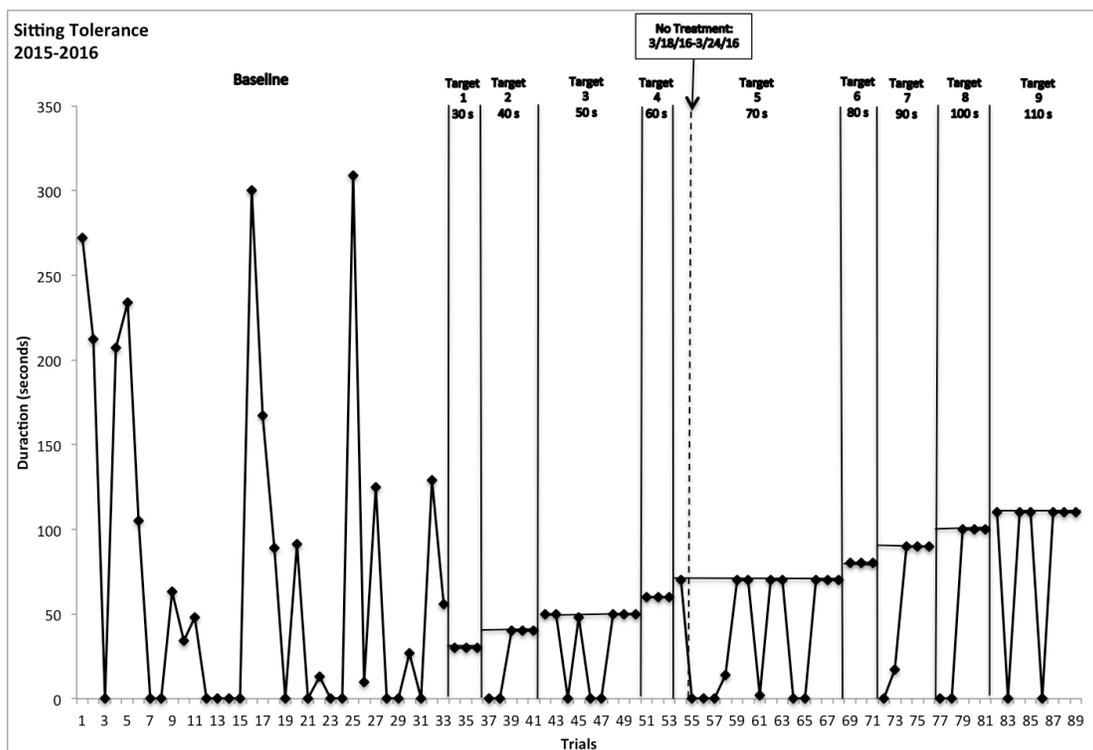


Figure 1 Duration of sitting tolerance

Discussion

The results suggest that the independent variable, positive and negative reinforcement combined with overcorrection positive practice, was effective in increasing the dependent variable, the participant's sitting tolerance through a changing criterion design. A potential functional relationship between the independent variable and the dependent variable was demonstrated each time steady state responding occurred, which was shown in the "stepwise" fashion of the changing criterion design (Cooper, Heron, and Heward, 2007, p. 219). Whenever the criterion was changed, responding changed, and then stabilized after exposure to treatment. "When it can be shown within the design that levels of responding do not change unless the criterion is changed, regardless of the lengths of phases, experimental control is evident," (Cooper et al., 2007, p. 219). Replication made the procedure more reliable and internally valid by showing that the treatment had experimental control over the participant's ability to sit upon request from an adult for longer durations.

However, while the participant demonstrated an ability to sit for increasingly longer durations, some data points show weaknesses in the design. For example, while the percentage of occurrence in which the participant did not sit at all decreased, the initial trial of each criterion does not necessarily show that the treatment had stimulus control over the participant's behavior. It would be expected that the participant's responding would show an ability to sit for at least the previous criterion duration. However, in this study, for targets 2, 8, and 9, the initial trial showed no target responding at all; in other words, the participant did not meet the last criterion and did not sit at all, so the duration was 0 seconds.

Some weaknesses were demonstrated within baseline procedures. An example of this is the first data point which was significantly higher than other data points. When this outlier was examined, the data showed that some of the materials in the environment were rubber stamps, which were later determined to be preferred items for the participant. Without more detailed recording (i.e., procedural integrity data) for other trials within a non-clinical setting that could potentially have several unforeseen environmental variables, it is difficult to determine if there was an error in baseline procedures or not, particularly when considering the outlier data points.

Despite this weakness, other data suggests strengths in that, when no treatment occurred for several days, the participant needed a longer exposure to treatment than other criteria to demonstrate stable responding. This was the case for Target 5, which showed a significantly higher number of trials to criterion. It is hypothesized that this was due to the absence of treatment for 7 days. It should also be noted that this target was only slightly lower than the baseline mean. Based on this information, the researcher concluded that setting the initial criterion around the baseline mean of 76 seconds would likely not have been an effective strategy for treatment and would have decreased exposure to treatment while increasing the likelihood of incorrect responses; this supports the original predictions of the researcher.

Based on these discrepancies, it is recommended that the treatment be replicated before extending replication to other subjects. This study's participant should undergo treatment again in the following ways: 1) A partial reversal should occur to further reflect actual control over the behavior or lack thereof; 2) A component analysis could determine if one component of the treatment was more effective than another, such as positive and negative reinforcement without overcorrection; 3) A component analysis could also determine whether overcorrection alone would inadvertently increase sitting, by decreasing the occurrences of leaving before being directed to do so by the researcher; 4) Since no data were

collected after the target duration was met, the researcher could analyze the effects of continuing data after certain contingencies are removed at the end of the criterion (e.g., adult prompting and attention, the preferred stimuli) or while all contingencies remain; 5) Finally, generalization probes should occur in other environments (another family member's home, a restaurant, etc...) and with other individuals, since the researcher was the only one to implement the treatment.

Other weaknesses occurred in the interobserver agreement data. While the mean duration per occurrence agreement was significantly high, threats to reliability occurred with absence of more human observers for more trials (only one observer recorded interobserver data for a single trial). This was partially due to the inability of the BCBA to observe for several weeks. Another observer was able to record during one trial, but it was not enough to show consistent reliability over time. Also, the researcher (who implemented all trials) was the one to compare her own recorded data with the video recorded data. Having another trained person to observe the video recordings and then make comparisons to the researcher's data would have been a more reliable method. As treatment continues, more interobserver agreement data should be collected using more trained individuals. This could also extend into taking more procedural integrity data. While integrity showed 100%, it occurred on only two occasions. Integrity data could be utilized to determine treatment drift or threats to validity. Finally, if interobserver agreement had occurred during the baseline phase, possible variables could have been observed for the data points that were outliers, as well as any causes to the increasing trendline in baseline data.

Another consideration for further replication would be to take baseline data on the latency of the participant's response to the discriminative stimulus, "Time to sit." Since the baseline procedure stopped data collection after 10 seconds, it is possible that a slightly longer latency would increase the occurrences of complying with sitting, and would thereby potentially reduce or eliminate trials during which no sitting occurred at all during treatment.

Finally, the absence of extinction procedures had a significant effect on behaviors. No self-hits or aggression occurred throughout baseline or treatment phases. It was hypothesized that this was due to the absence of utilizing an extinction procedure that would have required physically preventing the participant from leaving a sitting position. At no time was the participant physically prompted to sit. He was allowed to leave at any time, but was prompted to complete tasks if he left before the target duration was acquired. While this likely had a significant impact on the respondent's behavior, it was determined that physically restraining the participant was not desirable for the participant's family, making the current study more socially valid. During a post-treatment interview with the parents, it was reported that they noticed an increase in the frequency and duration that the participant complied with sitting with the family during various activities since treatment began. While the family did not record data, this should still be noted as a socially valid improvement for the consumers, which is hypothesized to be a result of treatment.

The treatment continued past the study, and will continue to do so until the recommended criterion of 5 minutes has been acquired. It is recommended that more procedural integrity data be collected, as well as interobserver agreement data, to increase the reliability of applications. It is also recommended that generalization probes occur, particularly with the family, after substantial training sessions are completed.

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Appendix A

Sitting Tolerance Baseline Data Sheet and Protocol

Tolerance of Sitting (table/floor/other furniture): Any duration the participant sits on his bottom for any length of time *within 10 seconds* of a request to sit down from an adult *without displaying behaviors to decrease* (i.e., vocal protest, aggression, and/or self-hitting). Record duration on *Data Sheet* (below) excluding the total duration that he engaged in behaviors to decrease. Example: Participant sits on the couch for five minutes while completing puzzles and earning reinforcement. Non-example: Participant sits at the table with his bottom on a chair while self-hitting. Staff would subtract the duration that he engaged in behaviors to decrease from total duration of sitting, and then record duration on *Baseline Data Sheet*.

Bxs to Decrease: See definitions below

Protocol:

1. Have 2 timers ready and mixture of open and close-ended play materials ready (open-ended = farm, instruments, blocks, etc...; close-ended = shape sorter, puzzle, etc...)
2. Present sd “Time to sit” paired with immediate presentation of visual
3. Participant must sit within a response latency of no longer than 10 seconds of the sd
4. If participant will not sit within 10 seconds of the SD, you can say, “Okay. We’ll try again later.”
5. During sitting trials, within 1 second participant’s bottom leaving the surface, prompt “all done” sign (see picture on back).
6. Engage in play with participant, using minimal prompting (gesture, light at forearm, verbal and model) to imitate you. Allow time for him to also explore materials and make it fun.
7. Record durations

Staff & Date	Setting Events Circle all that apply	Activity (while sitting)	Did You Show Visual For Sitting? (Y Or N)	BXS to Decrease Circle all that apply	Duration sitting W/O Bxs To Decrease	Total Sitting Duration
	<input type="checkbox"/> Sleep deprived <input type="checkbox"/> Sick <input type="checkbox"/> Hungry <input type="checkbox"/> Other: _____			<input type="checkbox"/> Vocal Protest <input type="checkbox"/> Aggression <input type="checkbox"/> Self-hitting <input type="checkbox"/> Other:		

Behaviors to Decrease Definitions

- a. *Vocal Protest*: Defined as exhibiting for 10 or more consecutive seconds vocalizations that are above normal speaking volume and paired with tears or crying sounds. An episode is over when the participant has refrained from exhibiting any of the above behaviors for 10 consecutive seconds.

- b. *Self-Hitting*: Defined as the participant using a closed fist to hit his body or face. An episode is over when he has refrained from hitting himself for 5 consecutive seconds.
- c. *Aggression*: Defined as the participant contacting another person's body with force with his hands or feet; biting (contacting another person's body with his teeth); pulling hair; grabbing (i.e. pulling at another person's body/clothing, or pulling an object someone else is holding). An episode is over when he has refrained from these behaviors for 5 consecutive seconds.

All Done Sign:



Appendix B

Data Sheet for Sitting Duration

Trial	Target Duration (seconds)	Total Duration (seconds)	+ or -	Trial	Target Duration (seconds)	Total Duration (seconds)	+ or -
1				21			
2				22			
3				23			
4				24			
5				25			
6				26			
7				27			
8				28			
9				29			
10				30			
11				31			
12				32			
13				33			
14				34			
15				35			
16				36			
17				37			
18				38			
19				39			
20				40			

Appendix C

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Preferred Items Based on Free Operant Assessment

- Yellow music radio
- Jungle music toy
- Rubber stamps
- Any push toy (push down the button and it spins)
- Yellow alphabet talking game toy with purple screen, face and pen
- Ferris wheel
- Red music record player
- Cassette player with cassette
- Ball ramp
- Mouse on mirror
- Xylophone
- Fake legos in red tin
- Blue keyboard
- Sunglasses

Appendix D

Sitting Tolerance Fidelity Checklist (√)	Yes	No
1. Did the trainer use a timer?		
2. Did the trainer have the preferred item ready?		
3. Was the preferred item an item from the “preferred” list?		
4. Did the trainer have the play materials ready?		
5. Did the trainer provide both the verbal and the visual SD?		
6. Did the trainer provide prompting for play?		
7. Did the trainer follow the correct protocol when the client did not sit within response latency of 10 seconds or less?		
8. Did the trainer provide the correct correction procedure when the client did not demonstrate a correct response?		
9. Did the trainer follow the correct procedure for negative reinforcement when the client met the target duration?		
10. Did the trainer record the duration accurately?		