AN EVALUATION OF TEACHING INDIVIDUALS WITH

AUTISM TO ACCEPT "NO"

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ABSTRACT

An Evaluation of Teaching Accepting "No"

Protocols and Techniques

by

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Challenging behavior may be evoked in individuals with intellectual and developmental disabilities when requests for items or activities are denied or delayed. When a problem behavior is evoked by denied access to items or activities, an individual's inability to accept "no" can be problematic and lead to high rates of challenging behavior. However, there has been limited empirical research conducted to examine methods of teaching individuals to accept "no" when access to preferred items or activities is denied. The purpose of this study was to evaluate the effectiveness of two methods of teaching an individual to accept "no" to minimize an individual's challenging behavior when access to preferred items, activities and edibles was denied or delayed. A response class hierarchy (RCH) assessment was initially conducted to determine which challenging behavior to target. The three individuals assessed, only one individual's behaviors occurred in a clear, predictable hierarchy. A" no" with an alternative and a "yes" with contingency intervention were then implemented with all three individuals

and compared to determine which method was most effective in reducing challenging behavior. For one of the participants, both treatments worked a majority of the time. Low levels of challenging behavior were seen during each treatment. For another participant both treatments worked equally and for the last participant, the "yes" with contingency appeared to be the most effective intervention and led to the lowest rates of challenging behavior. These results suggest that by either arranging contingencies or presenting an individual with alternatives, frequency of challenging behavior may be reduced.

ACKNOWLEDGEMENTS

I would like to thank everyone who was part of making this research study possible. I would not have been able to do all of this without the support, help, and guidance from my supervisors and co-workers.

<div align="right">Amanda Gill</div>

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CHAPTER 1

INTRODUCTION

Challenging behavior may be evoked in individuals with intellectual and developmental disabilities when requests for items or activities are denied or delayed. When a problem behavior is evoked by denied access to items or activities, an individual's inability to accept "no" could be problematic and lead to high rates of challenging behavior. This is why teaching individuals to accept "no", or to learn to tolerate a delay to preferred items is essential (Mace, Pratt, Prager, & Pritchford, 2011). However, within behavior analysis, minimal research has been conducted to evaluate the effectiveness of reducing challenging behavior by teaching individuals to accept "no." In the case of accepting "no," there have been two primary areas of focus in literature that have examined how to determine which challenging behavior to target, and how to teach appropriate ways to teach these individuals alternative means to access what they need, instead of using challenging behavior. Those two areas included response class hierarchies (RCH) to determine which behaviors to target and functional communication training (FCT) to teach individuals more appropriate means of accessing items and activities.

A response class consists of topographically distinct responses that produce similar effects on the environment, but have different probabilities of occurring (Mace, et al., 2011). Response class hierarchies are a range of behaviors within a response class that occur in a temporal and predictable order (DeRosa, Roane, Doyle, & McCarthy, 2013). One method for determining a RCH includes the use of an extinction analysis.

Once a function of challenging behavior has been identified, that function is made contingent (e.g., escape from demands, access to tangibles, and access to attention). For example, access to items would be contingent on only one topography of behavior while all other topographies were placed on extinction. If aggression was the contingent topography, only aggression would allow the individual to gain access to the reinforcement. All other behaviors (i.e. disruption, self-injury) would be put on extinction and if they occurred would not lead to the individual gaining access to reinforcement for that session. Reinforcing one behavior at a time, while putting all the other behaviors on extinction would help indicate whether or not the class of behaviors occurred in a specific and predictable order (Lalli, Mace, Wohn, & Livezey, 1995). Once a response class hierarchy is determined, intervention earlier on in the hierarchy can lead to the discontinuation of other behaviors later in the hierarchy (Lalli, et al , 1995). Less severe challenging behavior has been shown to occur prior to more severe challenging behavior in response hierarchies of behavior. (Richman, Wacker, Asmus, Casey, & Andelman, 1999). Clinicians can use this information to determine what behaviors to target with the goal of abolishing more severe challenging behavior (Harding, et. al, 2001; Mueller, Wilcyznski, Moore, Fusiler, & Trahant, 2001).

Functional communication training (FCT) is a method to teach individuals alternative methods to access reinforcement that typically would result from engaging in challenging behavior (Fisher, Kuhn, & Thompson,1998). FCT is one of the most effective and more common interventions for reducing challenging behavior (Tiger, Hanley, & Bruzek, 2008). Functional communication training, when combined with other techniques (e.g., punishment or reinforcement), or coupled with competing stimuli can be

a much more effective tool in reducing problem behavior than functional communication training by itself (Hagopian, Fisher, Sullivan, Acquisto, & LeBlanc, 1998; Hagopian, Wilson, & Wilder, 2001; Hagopian, Contrucci Kuhn, Long, & Rush , 2005).

Mace, et. al. (2011) compared two methods of teaching accepting "no" to an individual with Waardenburg syndrome and autism. The challenging behaviors included oppositional vocalization, loud vocalization, disruption, and aggression or threat of aggression and were maintained by access to tangible items. This study utilized an RCH assessment to determine which behavior to target. They found that by arranging contingencies ("yes" with contingency) or providing alternative tangible items ("no" with alternative), the likelihood of minor challenging behavior escalating to more severe challenging behavior was reduced. During baseline, the individual engaged in oppositional vocalizations between 40% and 100% of the intervals during sessions and loud vocalizations between 25% and 70% of the intervals. Although both methods were effective, the "no" with alternative contingency led to zero levels of challenging behavior during all conditions. The individual never engaged in disruption, aggression, or threats of aggression during the "yes" with contingency condition, and only engaged in oppositional and low vocalizations for 5-10% of the intervals during sessions. These results point to a promising intervention; and teaching accepting "no" is a skill that would be appropriate for many individuals. However, the results must be regarded as preliminary as they only used one participant. This study requires replication and extension in order to establish generality. Replication is vital to strengthen the reliability and external validity of research in the field. This will enable generality across settings, subjects, and behaviors (Sidman, 1960).

As stated by Open Science Collaboration in Science (2015):

Reproducibility is a defining feature of science, but the extent to which it

characterizes current research is unknown. Scientific claims should not gain

credence because of the status or authority of their originator but by the

replicability of their supporting evidence.

Replication is not only important within science in general, but also

particularly within the field of Applied Behavior Analysis (ABA). ABA uses single-

subject designs and tends to focus on very specific diagnoses and behaviors. Without

replication there is always a risk that particular studies within Applied

Behavior Analysis may only be applicable to that particular individual, diagnosis, setting

or other   idiosyncratic variable.

The purpose of the current research study was to replicate and extend Mace et.

al.'s response class hierarchy and accepting "no" protocols (2011). The following

research questions were addressed: Did an individual's challenging behavior occur in a

hierarchy, and if so, did intervening early in the escalation process minimize the

occurrence of more severe challenging behavior? Will teaching an individual to accept

"no" when access to preferred items is denied or delayed decrease the frequency of

challenging behavior?

CHAPTER 2

METHOD

Participants

Participants were three school-aged boys. Steve was a 15 year old diagnosed with Marfan syndrome, DiGeorge Syndrome, Pervasive Developmental Disorder, Intellectual Disability, Attention Deficit Hyperactivity Disorder, and Congenital Malformations of Heart and Circulatory System. Kurht was a 7 year old diagnosed with Autism, Intellectual Disabilities, Intermittent Explosive Disorder, Impulse Control Disorder, Oppositional Defiant Disorder, and Parent-Child Relational Problem. Pete was a 13 year old diagnosed with Pervasive Developmental Disorder, Disruptive Behavior Disorder, Cerebral Palsy, Spastic Dyplasia, and severe intellectual and communication deficits.

All three individuals lived in a residential facility and attended an approved private school. The function of each participant's targeted challenging behavior was to gain access to preferred tangible items. For two of the three participants, Kurht and Pete, functional analyses were conducted as part of their regular programming. Kurht's functional analysis had been conducted six months prior to the beginning of the current study, and Pete's was conducted nine months prior. A new functional analysis was conducted on Kurht's tantrum behavior. This behavior was newly classified and seemed to arise when access to preferred items and activities were denied.

Setting

All sessions were conducted in the individual's self-contained classroom in the school. The layout of the classrooms consisted of four to seven student desks, a teacher desk, bookshelves, and computer. Sessions occurred both after school hours and during the individual's school day.

Response Measurement

The researcher, along with several other members of the clinical team acted as the primary data collector and session therapist. They were recruited to act as data collectors and session therapists as this was an essential job duty that they were only trained and proficient in. During the RCH assessments and the accepting "no" treatment sessions, frequency data were collected on each of the individual's target challenging behaviors. Steve's target behaviors included aggression, disruption, darting, and dropping. Kurht's target behaviors included aggression, screaming, and dropping. Pete's target behaviors included self-injurious behavior, aggression, and disruption. Table 1 displays the operational definitions for all of the challenging behaviors for each individual. In addition to challenging behaviors, frequency data were collected during the accepting "no" treatment sessions on whether an individual was successful at accepting "no." For all of the individuals this was defined as the absence of challenging behavior after access was denied during the "no" with alternative condition, or upon completion of the non-preferred task during the "yes" with contingency condition. Latency to the first occurrence of challenging behavior after access to the preferred item was denied or delayed was also measured

Experimental Procedures

Prior to beginning of baseline and/or treatment sessions, preference assessments and functional analyses were conducted and/or reviewed.

Preference Assessment

A paired-choice preference assessment was conducted prior to the beginning of the study for two of the three participants to determine which tangibles, edibles, or activities were the most preferred. Figures 1-3 display which items were used and how they ranked amongst the other items. Each of the highest preferred items was used as the item that was denied or delayed during treatment sessions. Initially for Steve, jelly beans were used as they ranked highest amongst the other edible items. Initially for Kurht, the computer was used as it ranked highest amongst the other tangible items and activities. Initially for Pete, a ball was used as it ranked highest amongst the other tangible items. After several sessions, preference assessments were conducted prior to the beginning of each session to ensure that the highest preferred item at that moment was being held contingent.
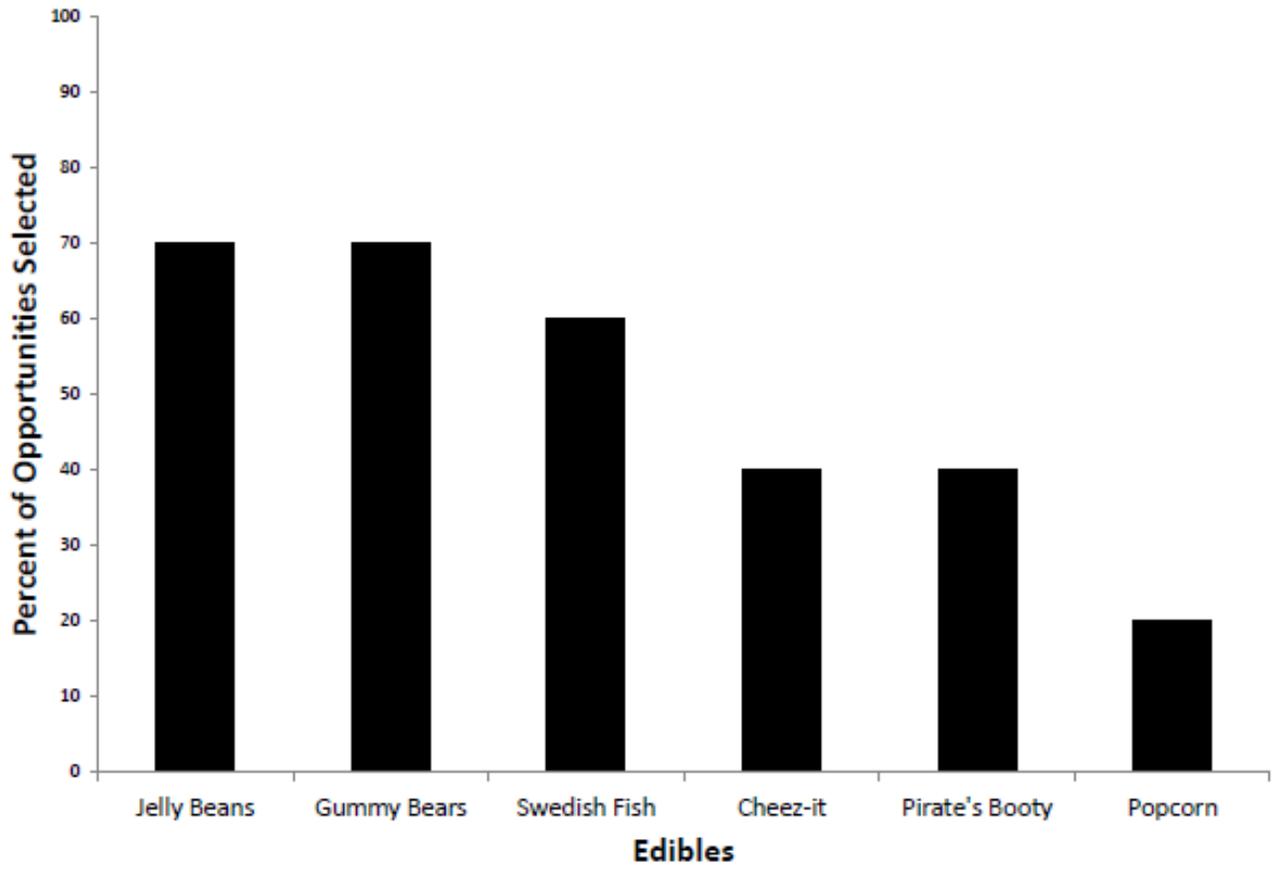
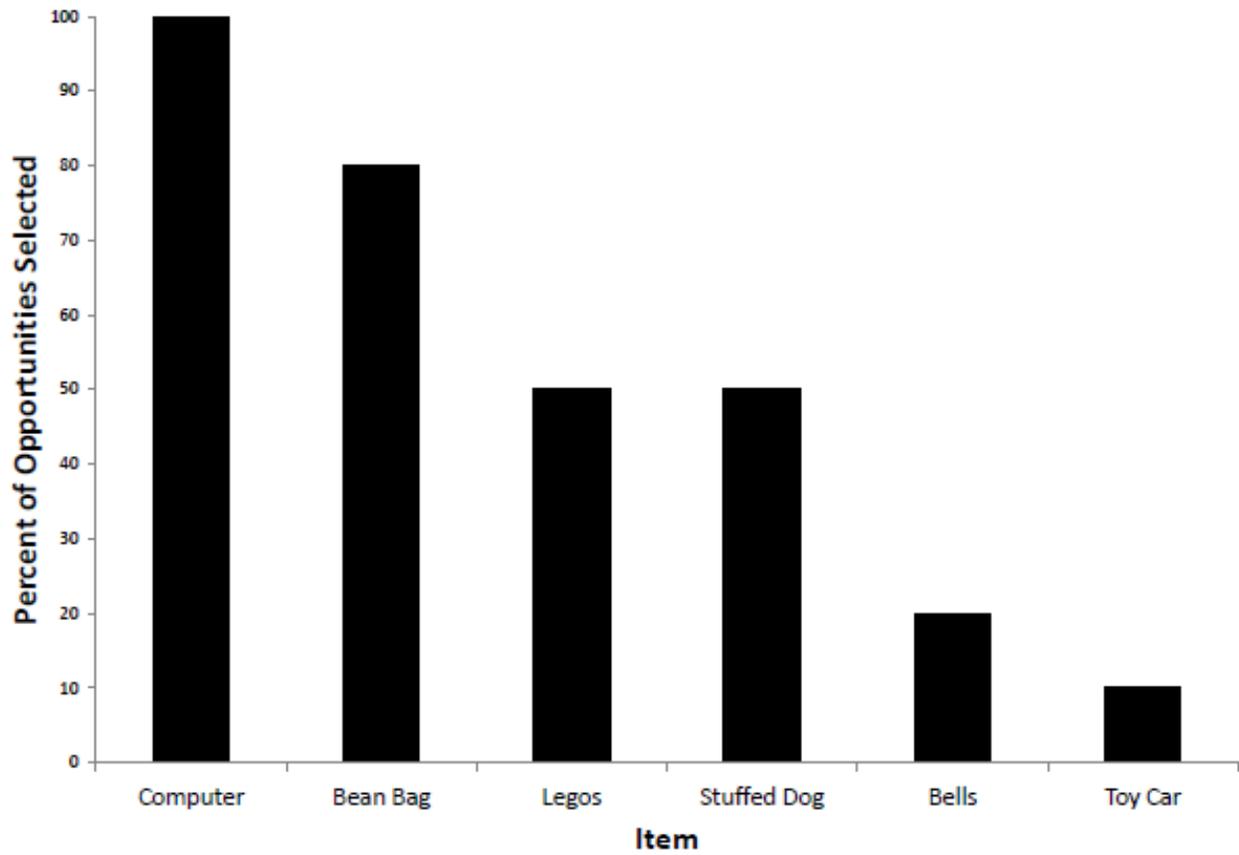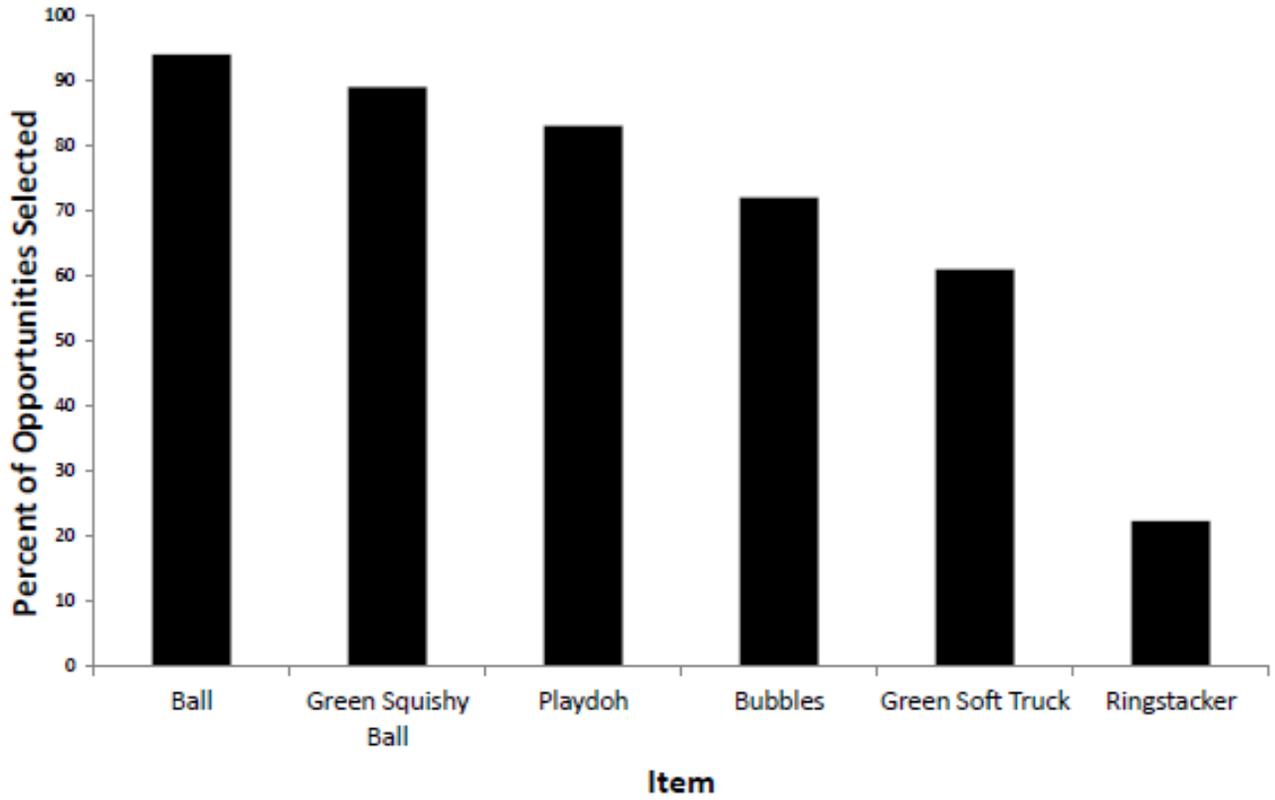*Figure 1.* Steve's paired-choice edible preference assessment.

Figure 2. Kurht's paired-choice tangible preference assessment.

Figure 3. Pete's paired-choice tangible preference assessment.

Functional Analysis

A new functional analysis was conducted for Kurht's tantrum behavior. The functional analysis was conducted in the natural environment using five minute sessions. The conditions that were tested included escape from demands, edibles, tangibles, and a 'restore environment' condition. During the 'restore environment' condition the therapist interacted with games and toys in a specific way (counter to how the individual preferred or was requesting). Contingent upon challenging behavior, the individual was allowed to 'restore' and manipulate the game and toy in their own way. (Ollington, Green, O'Reilly, Lancioni, & Didden, 2012). Many children with intellectual and developmental disabilities insist on sameness and are resistant to change in their environment and engage in challenging behavior when they are unable to restore their environment (Green et. al, 2006). This condition was conducted based on observation and feedback from direct care professionals and classroom teachers that the individual's challenging behavior was potentially evoked when his toys and environment were manipulated in a less-preferred manner.

Response Class Hierarchy Assessment

An RCH assessment was conducted to systematically rule in or rule out whether or not each individual's challenging behaviors occurred in a hierarchy. For Steve and Pete, all sessions were 10 minutes in length, for Kurht all sessions were 15 minutes in length. During each session only one behavior was targeted and reinforcement was only contingent for that target behavior. If the individual engaged in the target behavior for that session, they gained access to the preferred tangible or edible item. The other

behaviors were put on extinction. However, frequency data were collected for those behaviors when they occurred. A different target behavior was reinforced each session.

Baseline (A)

The RCH assessment sessions were used as the initial baseline condition, as well as the second baseline after alternating between both interventions. Following each request for the preferred item (as selected from the preference assessments) the therapist stated "no" and provided an explanation for the denied access to the preferred item or activity (e.g., "No, I am using the computer right now," or a similar phrase). The topography of requesting was determined based on the individual's primary communication modality. Both Kurht and Pete used vocalization and Steve used picture icons. Kurht did have a sentence strip available during sessions as a visual cue to request for the item or activity if needed to request and Pete's vocalizations were unaided. There was no programmed response to challenging behavior.

Intervention (B): "No" with Alternative Condition

During these intervention sessions the target item was not available at any point. A confederate was engaging with the preferred item or activity item. Contingent on a request for a preferred item or activity, an alternative was provided (e.g., "Bobby is working on the computer right now, but you can play with the stuffed animal," or a similar phrase). The alternative item was a moderately preferred item that was determined by a preference assessment. The topography of requesting was determined based on the individual's primary communication modality.

Intervention (C): "Yes" with Contingency Condition

During these intervention sessions the target item or activity was available after a task was completed. A confederate was engaging with the preferred tangible/edible item. The individual requested for the preferred item or activity either via vocalization or picture exchange. Contingent on completion of a non-preferred task, access to the requested item or activity was granted (e.g., "You can play on the computer, but first you have to complete this puzzle," or a similar phrase). The non-preferred task was selected based on feedback from classroom teachers and direct care professionals as to which activities led to higher rates of challenging behavior. The verbal stimulus was always immediately provided after the request. The topography of requesting was determined based on the individual's primary communication modality.

Observer Training

Observers were required to review definitions of the target behavior and read the session description for an explanation of each condition. All observers were part of a clinical team that required at least 80% inter-observer agreement during practice trials before collecting data as part of their job requirement. The clinical team was part of a residential treatment program.

Inter-Observer Agreement

Data were collected using a software program named B-DataPro (Bullock, 2016). The data collectors collected frequency data using a pre-programmed key card. Each key card had a corresponding letter for each target behavior. The data collector would select that letter from the keyboard any time the behavior occurred. For example, the letter "a" corresponded to aggression. If aggression occurred, that key would be selected.

Response Class Hierarchy Assessment.

Inter-observer agreement (IOA) was collected for 37% of the trials across all of the RCH assessment conditions. The mean agreement across sessions was 98%.

Accepting "No" Intervention. Inter-observer agreement (IOA) was collected for 31% of the trials across all of the Accepting "No" treatment conditions. The mean agreement across sessions was 96%.

Design

This study employed an alternating treatments design. Consecutive baseline (A) sessions were conducted followed by equal alternation of intervention conditions B and C. The sequence was replicated using an alternating treatment design.

CHAPTER 3

RESULTS

All of the accepting "no" assessment graphs include two y-axes. The right y-axis

displays the combined responses per minute of challenging behavior and the left y-axis

displays the percentage of accepting "no" or "yes" when an item or activity is denied or

delayed.

Steve's RCH Assessment

Figure 4 displays the mean latency to each target behavior calculated by adding

each latency of the first occurrence of the behavior and dividing by two, which was the

number of rounds conducted. After conducting the RCH assessment, it was determined

that Steve's target behaviors did not occur in a clear hierarchy. All of Steve's target

behaviors were tracked during his Accepting 'no" assessment.

Steve's Accepting "No" Assessment

Figure 5 displays the results of Steve's accepting "no" assessment. Treatment

conditions were conducted until stable responding occurred with low levels of

challenging behaviors. A reversal to baseline conditions was implemented until elevated

levels of challenging behavior were seen. After reversing back to alternating between

treatment conditions, both the treatment conditions were effective in decreasing

challenging behaviors when access to preferred edibles is denied or delayed. Steve's

challenging behavior averaged a rate of 25 responses per minute during baseline and 15

responses per minute during the "no" with contingency and 6 responses per minute

during the "yes" with contingency.

Kurht's RCH Assessment

Figure 6 displays the mean latency to each target behavior and was calculated by adding each latency of the first occurrence of the behavior and dividing by three, which was the number of rounds conducted. After conducting the RCH assessment, it was determined that Kurht's target behaviors did not occur in a clear hierarchy. It was determined that there was no clear hierarchy due to each behavior in the response class not occurring in a clear, predictable order. All of Kurhts's target behaviors were tracked during his Accepting "no" assessment.

Kurht's Accepting "No" Assessment

Figure 7 displays the results of Kuhrt's accepting "no" assessment. Treatment assessments alternated between "yes" with contingency conditions and no with alternative conditions. These were conducted until stable responding occurred with low levels of challenging behaviors. A reversal to baseline conditions was conducted until elevated levels of challenging behavior were observed. After switching back to alternating between treatment conditions, both the treatment conditions were effective in decreasing challenging behaviors when access to preferred items is denied or delayed Kurht had a 100% reduction in challenging behavior. His challenging behavior occurred on average 6 times per minute during baseline and zero responses per minute during both the "no" with alternative and "yes" with contingency conditions.

Pete's RCH Assessment

Figure 8 displays the mean latency to each target behavior which was calculated by adding each latency of the first occurrence of the behavior and dividing by three. After conducting the RCH assessment, it was determined that Pete's target behaviors did occur in a clear hierarchy as his behaviors occurred in a clear predictable order. Disruption

always occurred first, followed by aggression, then followed by self-injurious behavior. Disruption was the primary behavior targeted during his accepting "No" assessment.

Pete's Accepting "No" Assessment

Figure 9 displays the results of Pete's accepting "no" assessment. Treatment assessments alternated between "yes" with contingency conditions and "no" with alternative conditions. These were conducted until stable responding occurred with low levels of challenging behaviors. A reversal back to baseline conditions was conducted until elevated levels of challenging behavior were observed. After switching back to alternating between treatment conditions, the "no" with alternative condition was more effective in reducing challenging behavior when access to preferred tangible items was denied or delayed. Pete's challenging behavior occurred at an average rate of 7.5 responses per minute during baseline and 1.3 responses per minute during the "no" with alternative, but 8.5 responses per minute during the "yes" with contingency.
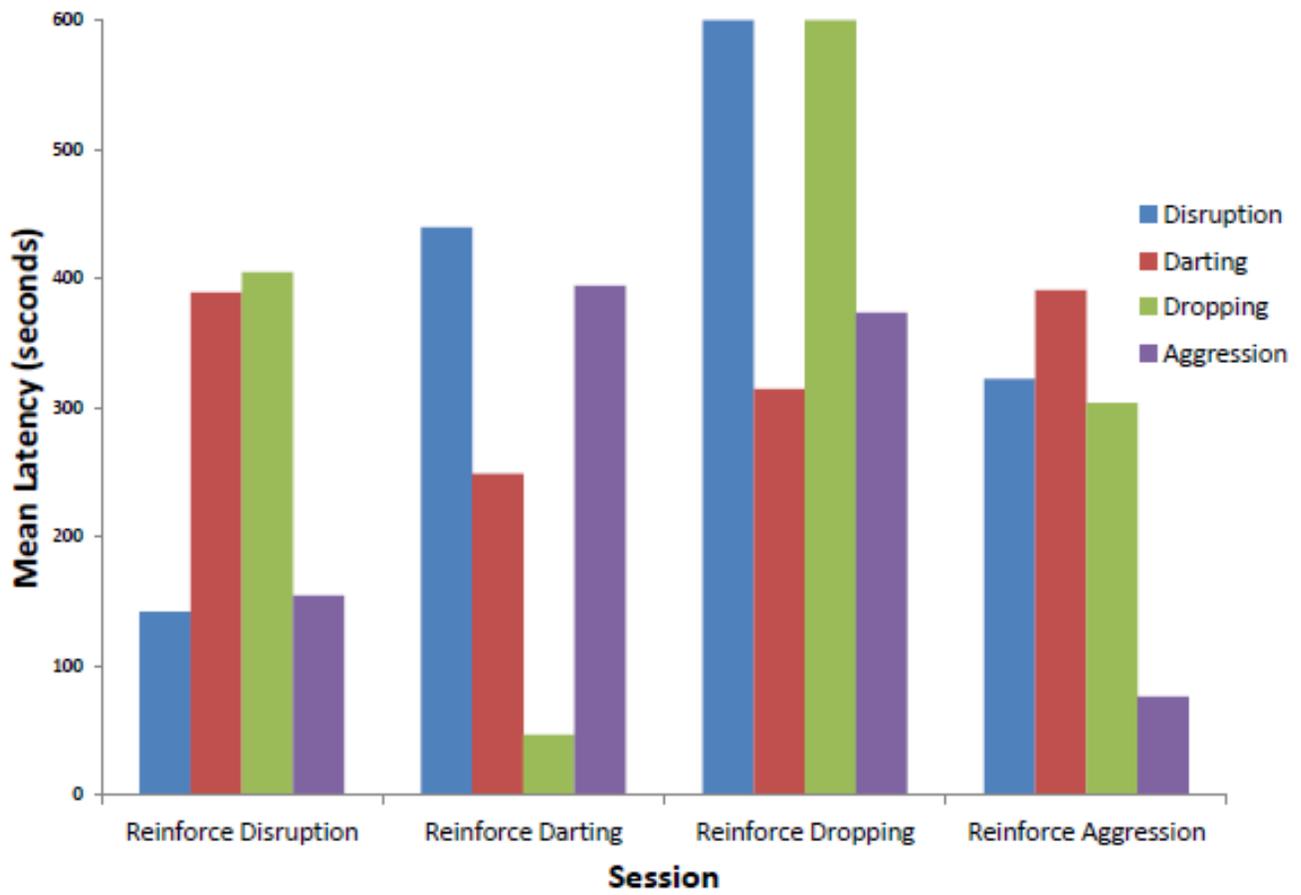
Figure 4. Steve's Response-Class Hierarchy Assessment showing the mean latency to the first occurrence of the target behavior during each of the contingencies.
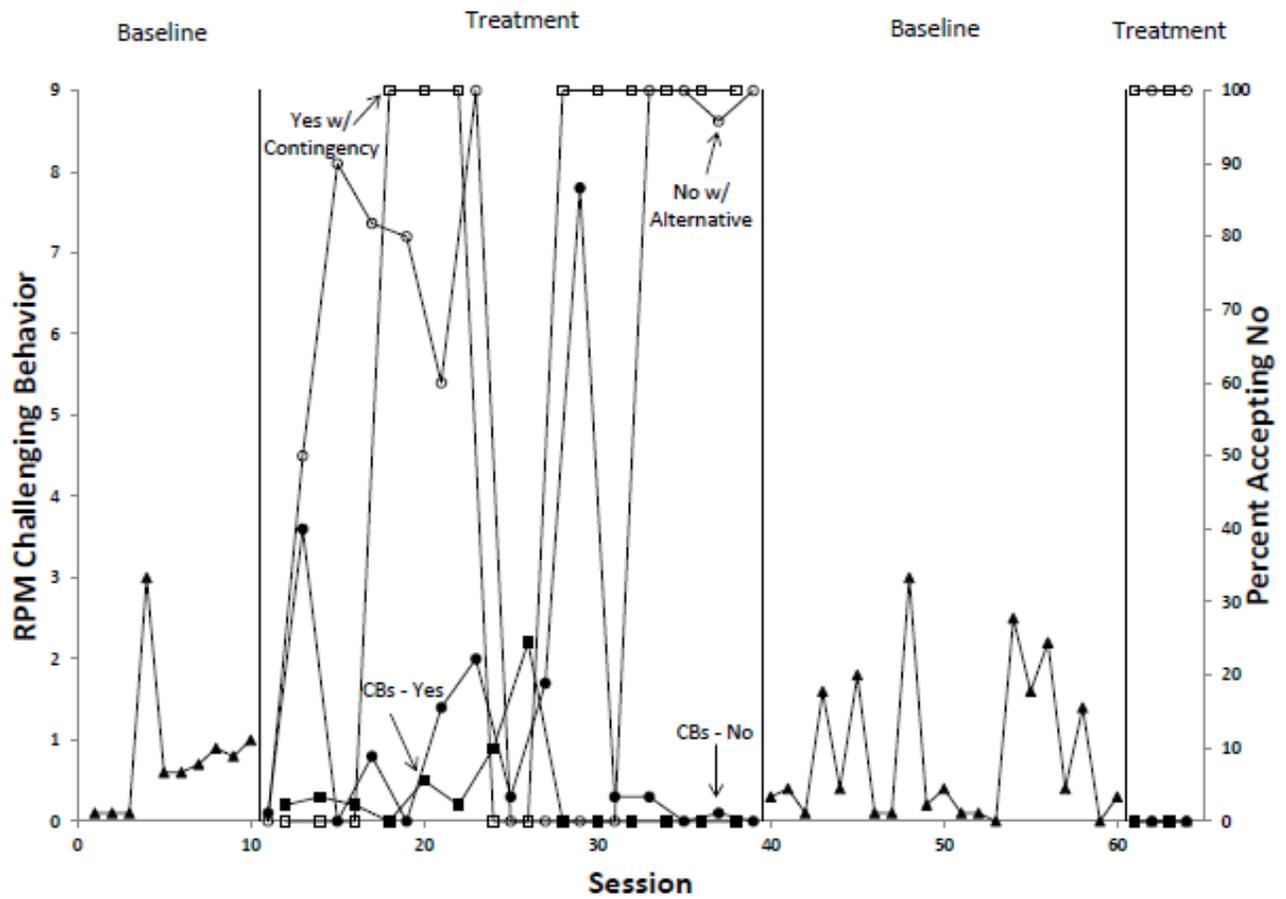
Figure 5. Steve's Accepting "No" Assessment showing the combined number of challenging behavior per minute (left axis) and the percentage of accepting "no" or "yes" plus alternative for each intervention (right axis).

Figure 6. Kurht's Response-Class Hierarchy Assessment showing the mean latency to the first occurrence of the target behavior during each of the contingencies.
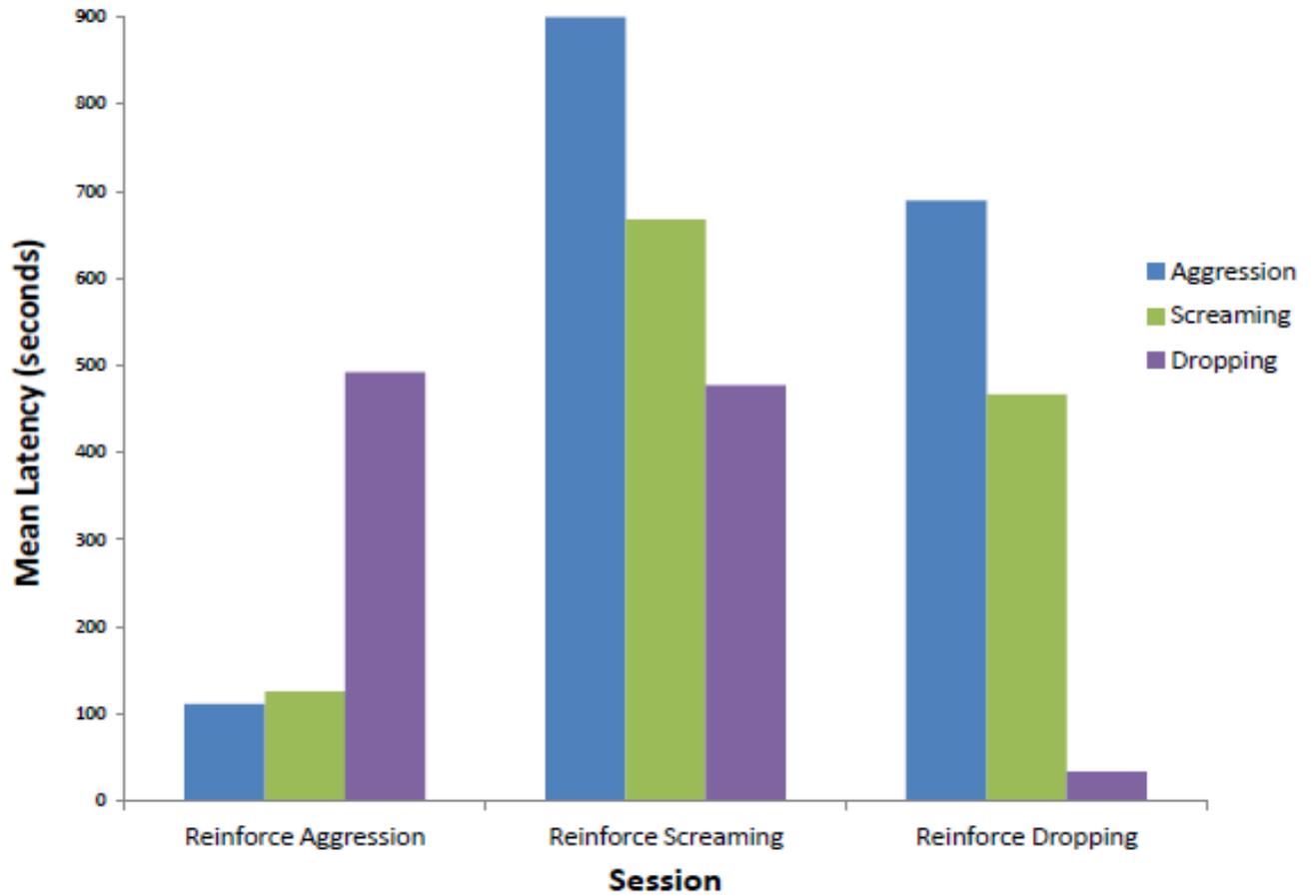
Figure 7. Kurht's Accepting "No" Assessment showing the combined number of challenging behavior per minute (left axis) and the percentage of accepting "no" or "yes" plus alternative for each intervention (right axis).

Figure 8. Pete's Response-Class Hierarchy Assessment showing the mean latency to the first occurrence of the target behavior during each of the contingencies.

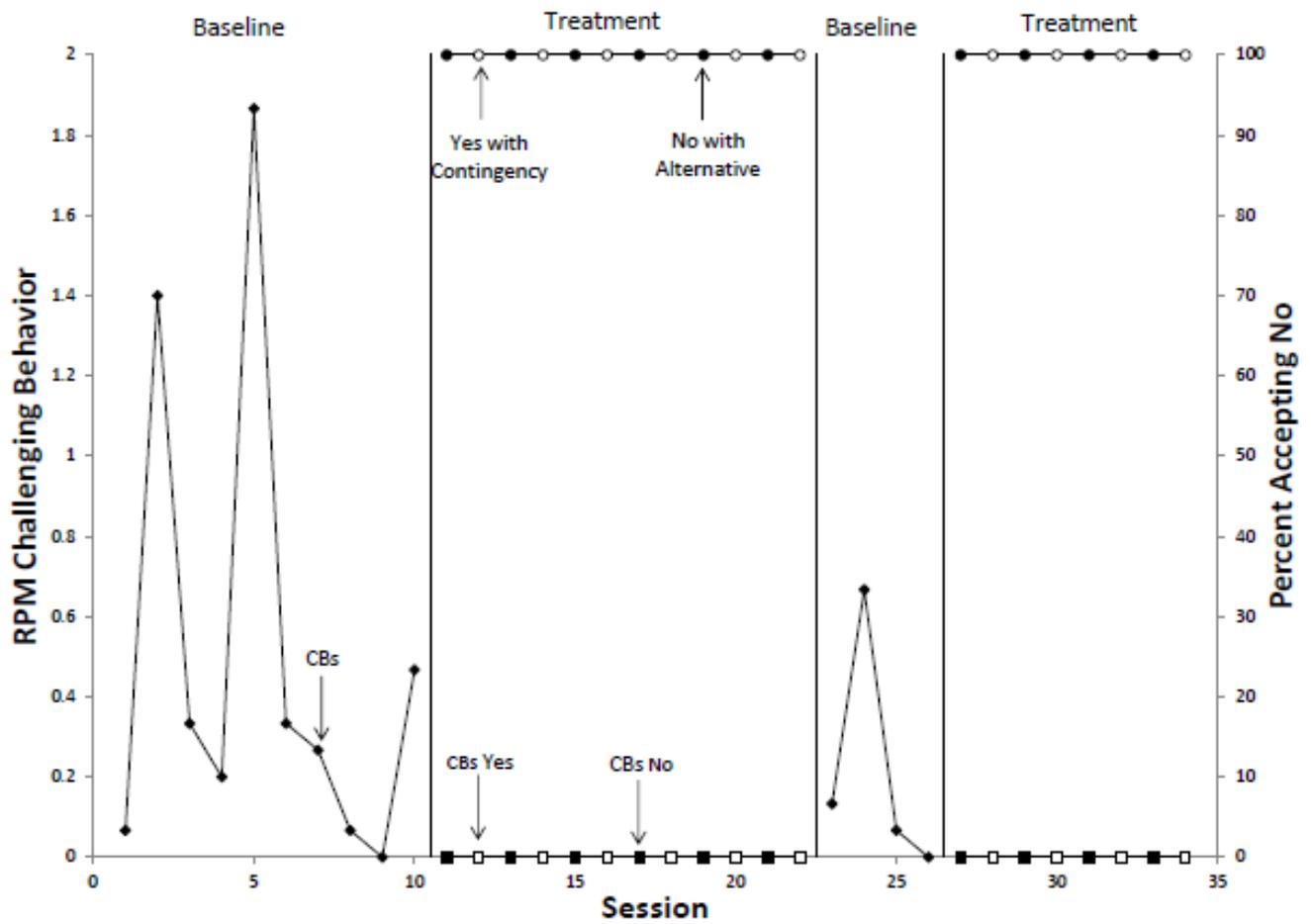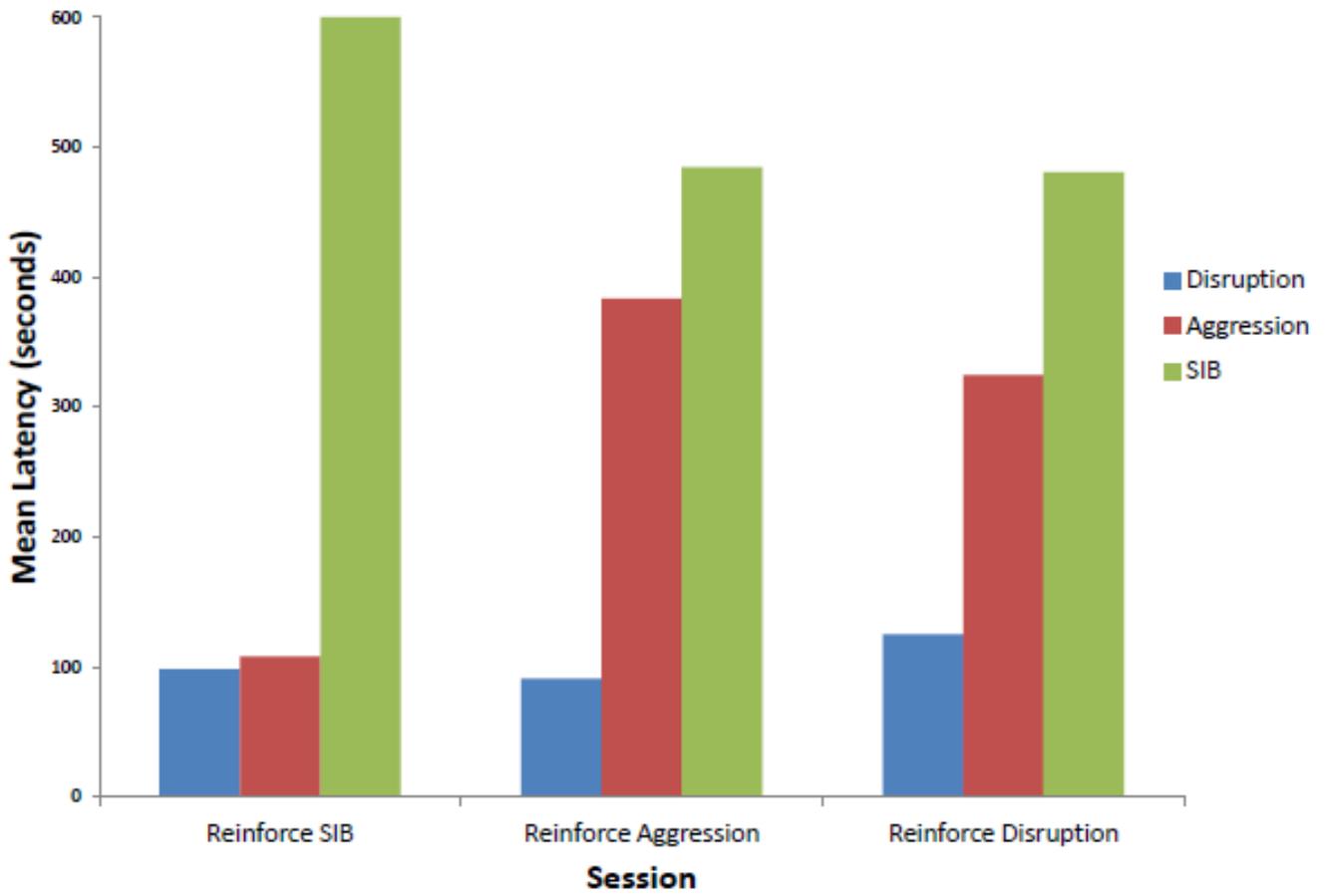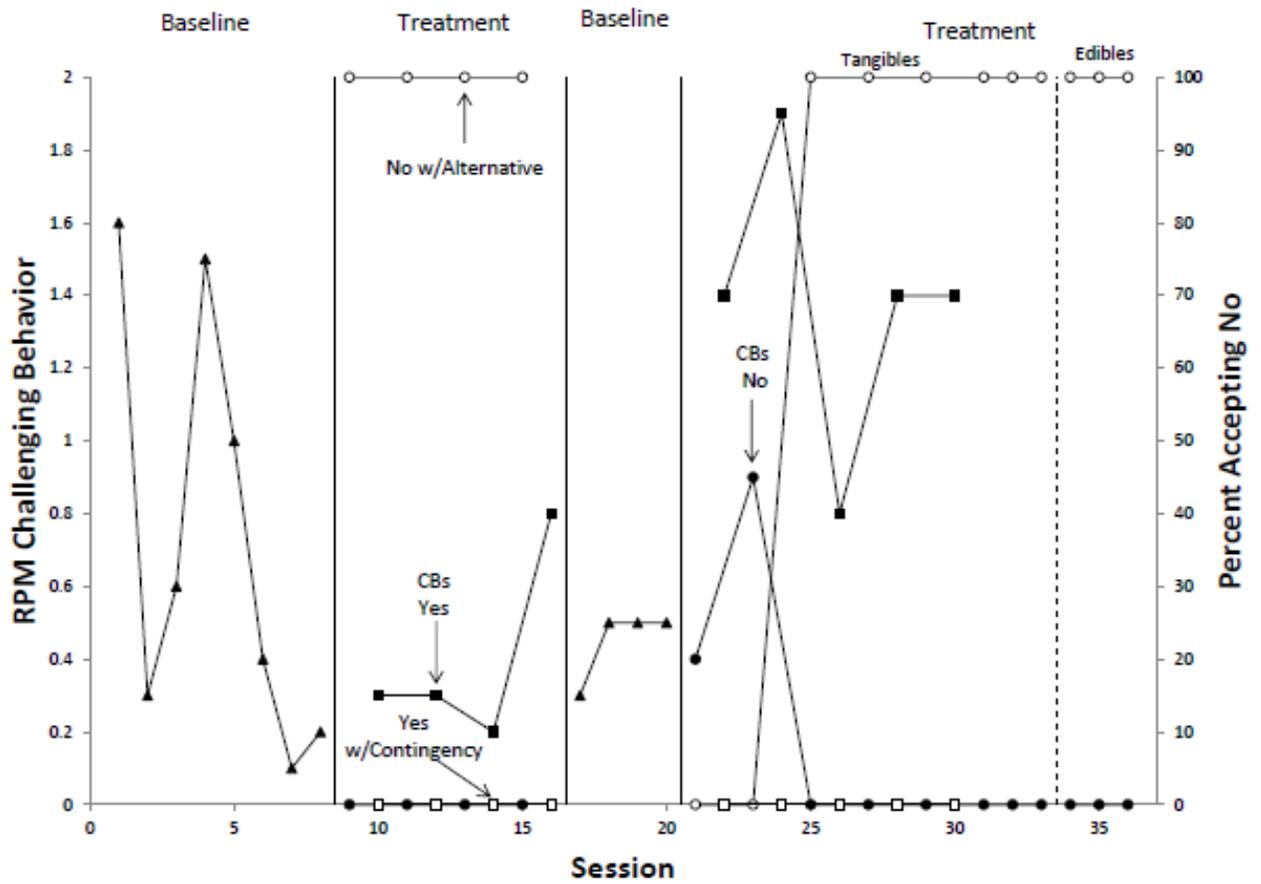*Figure 9.* Pete's Accepting "No" Assessment showing the combined number of challenging behavior per minute (left axis) and the percentage of accepting "no" or "yes" plus alternative for each intervention (right axis).

CHAPTER 4

DISCUSSION

The present study demonstrated that teaching an individual to accept "no" when preferred items or activities are not available, or access is delayed can be effective in reducing challenging behavior. Reduction in frequency of challenging behavior occurred during treatment conditions for all participants regardless of whether their challenging behavior occurred in a clear RCH.

This study was a syematic replciation of Mace, et al. (2011). A systematic replication successfully reproduces the results of previous research while varying one or more aspects of that study. This demonstrates the reliability and external validity of previous findings (Sidman, 1960). Both studies focused on teaching accepting "no" to individuals on the autism spectrum but Mace, et al used one participant, while the current study used three. Mace et. al used an individual who was very high functioning, spoke in multiple complete sentences, and had moderate articulation difficulties. The current study used three individuals who were lower functioning, communicated with one to three word utterances or by picture exchange, and two of the three participants have vision and hearing impairments. Both studies used individuals whose challenging behaviors were evoked by denied access to preferred items. However, Mace, et al. did not discuss specifically how they determined that the individual they studied had challenging behaviors that were evoked by denied access, nor how a "preferred item" was determined. The current study utilized functional analyses to determine that an individual's behavior was maintained by positive reinforcement in the form of access to tangibles and challenging behavior was maintained when access to those tangibles was

denied, as well as preference assessments for all three individuals. Repeated preference assessments were conducted due to the individual's preference continuously changing, leading to temporal instability. This instability means that preferences and reinforcers need to be continuously evaluated (Wine, Gilroy, & Hantula, 2012).

Reduction of challenging behavior occurred across all participants in the current study. For Steve, both the "no" with alternative and "yes" with contingency resulted in overall reduction of frequency of his challenging behavior. However, the "yes" with contingency led to a more significant decrease from baseline levels. For Kurht both interventions worked equally as well and resulted in a complete reduction of challenging behavior from baseline. For Pete, the "no" with alternative led to a reduction in challenging behavior and the "yes" with contingency led to a slight increase from baseline levels. These differential results could be explained by the concept of delayed reward discounting. The longer an individual has to wait, the less valuable or reinforcing it potentially becomes (MacKillop, 2013). During the "no" with alternative, the individual was provided with immediate access to an alternative item or activity, while in the "yes" with contingency access to the preferred item or activity was delayed until a task was completed. This required the individual to not only wait, but required more response effort, as they were required to complete a contingent task. It should be noted that there was an open economy, as the preferred items and activities were available outside of sessions.

Not only did this current study replicate Mace et al. (2011) with one of the individuals, we extended their research. They also assumed a RCH, where the current study explicitly tested for and discussed how and if an individual's behaviors occurred in

a clear, predictable hierarchy. This strengthens the need for replication not only within this topic, but within the field as a whole.

As stated by Johnston and Pennypacker (1980):

A replication as the degree to which equivalent environmental manipulations (i.e., independent variables) associated with earlier observations are duplicated. Replications provide information regarding the generality of a functional relationship over a range of conditions (e.g., subjects, settings, experimenters, etc.). Thus, failure to assess the degree to which treatments are implemented as planned compromises the science of building a replicative history.

Replication allows the field to continue to grow and stengthen our resaerch base. The ability to replicate and extend such studies is also clincially significant. A large majority of individidals enagage in challenging behaviors as a result of denied access to preferred items. A functional way to accept delayed and/ or denied access is critical (Hanley, Iwata, McCord, 2003).

There were several limitations that future research should explore. The first is that there were no procedureal fidelity measures. Altthhough this replication increased the number of partcipants, three indidviduals is still a small sample size. Future research should increase not only the number of particpants, but also diversify ages, diagnoses, and living environments.This would strengthen the generality of research and methodology. Although the current interventions ("no" with alternative and "yes" with contingency) resulted in behavior reduction for all of the partcipants, future research may look at including more methods when teaching an individual to accept "no." Future research might systematically examine specific time delays (work based versus time

based) and assesses whether an individual has a breaking point for when a highly preferred item is no longer reinforcing. Examining the effects of an open economy versus a closed economy may be beneficial. Future research could explore whether restricting access to an item once it is no longer avaialble has an effect on rates of challenging behavior. Future research may also look at providing an individual with an array to choose from when access to a preferred tangible is denied. Mace, et al. (2011) and the current study are preliminary steps in teaching individuals functional ways to accept when items are not immediately available or are denied rather than allocating their responses to more challenging behaviors. Future research will be vital in expanding these results and the generality of the procedures.

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APPENDIX

Table 1.

Steve's Operational Definitions
Aggression: Any attempt or instance of hitting, kicking, pushing, biting, head butting, pinching, scratching, pulling hair, spitting, or throwing objects within 2 feet of another person.
Disruption: Any instance of throwing (excludes times when throwing is part of a game), tearing, banging, breaking, dumping items, or hitting/kicking/pushing or swiping objects or furniture.
Darting: Any instance of Steve moving more than 5 feet from an adult without being directed to transition to another location
Dropping: Any instance of Steve sitting on the floor or refusing to stand before the physical prompt following a demand
Kurhts's Operational Definitions
Aggression: Any instance or attempt of hitting with an open or closed fist, kicking, biting, scratching, pinching, head butting, pulling hair, wrapping himself around another individual's legs, and/or throwing objects within 2 ft. of another individual.
Screaming: Any instance of Kurht's voice going above a conversational level, or making a loud vocalization in a non-functional manner. Does not include loud vocalizations when excited or enthused.
Dropping: Any instance of Kurht going from a standing to seated position, or from a seated position to the floor without being directed to do so or in a functional manner (i.e. sitting on the ground to tie his shoes, etc)
Pete's Operational Definitions
Disruption: Any instance or attempt to throw, rip, tear materials, break, hit or kick objects (e.g. walls, windows doors, and desks), flip furniture, swipe objects from walls/furniture. Does not include knocking on a door before entering or pounding a beat on the furniture (e.g. tapping the beat when singing wheels on the bus).
Aggression: Any instance or attempt at biting others, hitting others with open or closed hand, pinching, kicking, hair pulling, throwing objects within 2 ft of an individual.
Self-Injurious Behavior: Any instance or attempt at hitting head from a distance of 6 or more inches with a closed fist, or at putting a hand or arm past the plane of his lips. Excludes moments when getting something out of mouth or eating food by hand.