The Effects of Response Interruption and Contingent Demands on Reducing Vocal Stereotypy in Young Children with Autism Spectrum Disorder

Thesis

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By

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Abstract

A reversal design was used to examine the effects of a non-vocal and a vocal response interruption and contingent demands (RICD) procedure on the vocal stereotypy of 2 young girls diagnosed with autism spectrum disorder. Both participants had high and variable levels of vocal stereotypy during baseline conditions. During each of the non-vocal and vocal conditions, a decrease in vocal stereotypy occurred. However, the vocal RICD condition led to the quickest decrease in percentage of time engaged in vocal stereotypy, total number of times the procedure was implemented, and the total amount of time spent in session. This study contributes to the growing body of research that focused on decreasing vocal stereotypy by demonstrating the effectiveness of the non-vocal RICD procedure.

Keywords: autism, vocal stereotypy, response interruption, contingent demands

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Fields of Study

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Chapter 1: Introduction

A diagnosis of autism spectrum disorder (ASD) consists of impairments or delays in several areas prior to the age of 3. These areas include impairments in social interactions, impairments in communication, and the appearance of repetitive interests or stereotyped behavior (American Psychiatric Association, 2000). Engagement in stereotypy is a common characteristic for individuals diagnosed with ASD, and is most often defined as repetitive movements or vocalizations that do not seem to serve an adaptive function (Baumeister & Forehand, 1973; Berkson & Davenport, 1962; Kennedy, Meyer, Knowles, & Shukla, 2000; LaGrow & Repp, 1984; MacDonald et al., 2007; Matson, Kiely, & Bamburg, 1997; Smith & Van Houten, 1996). Stereotypic behaviors include but are not limited to repetitive vocalizations and repetitive body movements (e.g., hand flapping and tensing). It is not unusual for typically developing children and individuals with other developmental disabilities, in addition to those with autism, to engage in stereotypic behaviors (Athens, Vollmer, Sloman, & St. Peter Pipkin, 2008; MacDonald et al., 2007; Rapp et al., 2004). Stereotypy in typically developing infants and young children might include repetitive body movements, such as hand flapping or body rocking. It could also include vocalizations such as 'babababa' made out of context of toy play or reciprocal 'conversations' with a parent. However, for typically developing children repetitive behaviors do not persist over time and are eventually replaced with

appropriate play, language, and expression of emotion (MacDonald et al., 2007; Thelan, 1979).

Impact of Stereotypic Behavior

Hart and Risley (1995) conducted a two-year study looking at how and when vocabulary is acquired during the first years of life in typically developing children. Participants included 42 families from three different socio-economic backgrounds; families on welfare, working class families, and professional families. The researchers conducted home observations and coded language opportunities between the caretakers and the children. Based on information gathered during these observations, Hart and Risley commented on the importance of the first 3 years of life, noting that these first years are when children are most inclined to learn from interactions with adults and to use these interactions as a building block to base and expand future vocabulary experiences. Hart and Risley recognized that language experiences by the age of 3 does influence future reading abilities and allowed them to predict vocabulary performance and reading comprehension on standardized tests at age 9. Hart and Risley demonstrated that the first 3 years of life are important for the development of language skills. Equally important for researchers is to know when vocal stereotypy begins to emerge in children with ASD.

Recently, MacDonald et al. (2007) compared 30 children with ASD to 30 typically developing children to determine the age that a difference in the level of engagement in stereotypy, motor and vocal, begins to emerge. This study used direct observations to track the amount of time the children spent engaging in stereotypic behavior. MacDonald et al. determined that around 2-years-old a difference in time spent

engaging in stereotypic behavior began to emerge. By the time the children were 4-years-old, there was a sizeable difference in the amount of time spent engaging in stereotypic behavior between typically developing children and children with ASD. The children with ASD engaged in more vocal stereotypy than their typically developing peers. MacDonald et al. noted that typically developing children tended to comment about their surroundings, spoke in clear phrases, and made eye contact while speaking to the researcher, whereas children with ASD tended to engage in repetitive noises, inappropriate vocalizations, and typically avoided eye contact with the researcher. MacDonald et al. stated that identifying a way to reduce vocal stereotypy would be an important goal for young children on the autism spectrum.

In relation to children with ASD who engage in vocal stereotypy, it could be that when a child engages in vocal stereotypy they are not attending to the vocal stimuli present in their environment. The lack of attention could lead to hearing fewer words during a crucial developmental time in their lives for language and cognitive abilities. This indicates the need for effective interventions that target vocal stereotypy in children with ASD. Early interventions could possibly change the developmental trajectory of these children and allow them to develop better language skills.

For typically developing children, much of what is learned occurs by observing adults, siblings, or peers and imitating these actions or speech in the appropriate context with others. Stereotypic behavior can hinder the ability of children with ASD to gain new skills from the general environment (Kennedy et al., 2000; Lovaas, Koegel, Simmons, & Long, 1973). Generally, when an individual spends time engaging in repetitive behaviors, s/he is unable to acquire new skills through incidental learning (Ahearn, Clark,

MacDonald, & Chung, 2007; MacDonald et al., 2007). Incidental learning consists of students gaining additional information from the lesson that was not specifically taught (Blumburg & Torenburg, 2005; Ledford, Gast, Luscre, & Ayers, 2007). For example, a teacher may plan a lesson for the group using a book about bears. The goal of the lesson is to introduce sequentially ordering events, but while reading the teacher points out several colors the students have no or minimal exposure to, such as periwinkle. Later, several of the students are playing in the block center and trying to decide if the color of some of the blocks is periwinkle.

In many classrooms, students are expected to learn through teacher-led instruction, as well as through the observation of peers' actions. If the child is engaged in time-consuming stereotypic behaviors, the child may be unable to attain adaptive behaviors and academic skills. For instance, a vocabulary lesson taught at the beginning of the week may be critical for understanding needed in an activity to be done later in the week. If the student is engrossed in vocal stereotypy during the vocabulary lesson, s/he may be unable to independently perform the activity done later in the week based knowledge gained during the vocabulary lesson.

When children are engrossed in stereotypic behaviors, these children are missing time to interact with peers or build peer relationships, whereas, a child who does not engage in stereotypic behavior has increased opportunities to interact with peers and work on building social relationships. Engagement in stereotypic behaviors can also impact conversational interactions with peers. Conversation skills become increasingly more important as children move through school and peer relationships become more complex. That is, children move away from game play to more conversationally

dependent exchanges. In addition to building peer relationships, social rules and niceties (e.g., saying, 'bless you' when someone sneezes or standing quietly in line), can be more difficult to develop for children with ASD who engage in vocal stereotypy because the child is spending most of her/his time engaging in stereotypic behavior.

Stereotypic behaviors can also disrupt other people in the general education classroom (Conroy, Asmus, Boyd, Ladwig, & Sellers, 2007; Macintosh & Dissanayake, 2006; Ochs, Kremer-Sadlik, Solomon, & Sirota, 2001). Disruptions to the classroom environment may include repetitive questioning directed at the teacher that disrupts the flow of the lesson or repetitive body movements and/or vocalizations that distract other students during instruction. Stereotypic behavior that leads to classroom disruption can cause the teacher or paraprofessional to provide frequent redirections for the student to engage in appropriate behavior. The attempts to redirect the student's behavior can disrupt the flow and pacing of a lesson. As more classrooms contain students with ASD, it is becoming increasingly important to develop procedures that will decrease the level of stereotypic behavior exhibited by children with ASD. Effective classroom interventions will need to be procedurally sound and easy to teach and implement in the classroom (Conroy, Asmus, Sellers, & Ladwig, 2005; Detrich, 1999).

Interventions to Reduce Stereotypic Behavior

Differential reinforcement of other behavior (DRO) is a nonaversive method that has been recommended to help regulate stereotypic behavior of individuals with ASD (Haring, Pitts-Conway, Breen, & Gaylord-Ross, 1986). DRO is a reinforcement procedure in which the reinforcer is delivered contingent upon the non-occurrence of the target behavior for a certain time interval (Cooper, Heron, & Heward, 2007). Several

studies have used DRO procedures alone (Ringdahl et al., 2002; Taylor, Hoch, & Weissman, 2005), or DRO in combination with other procedures such as response interruption (Fellner, Laroche, & Sulzer-Azaroff, 1984; Harris & Wolchik, 1979; Richmond & Bell, 1983). Due to the high frequency of the behavior and the challenge associated with deciding upon an appropriate interval length, these studies have indicated that a DRO procedure alone might not be an effective intervention for stereotypy (Harris & Wolchik, 1979; Richmond & Bell, 1983). Stereotypic behavior is generally identified as automatically maintained behavior and may not be impacted by a socially delivered reinforcement procedure. DRO is a reinforcement-based procedure that uses previously identified reinforcers to increase the occurrence of behaviors other than the targeted behavior. The identified reinforcers would need to be more potent than the reinforcing qualities of engaging in stereotypy in order for this procedure to be effective. For behavior that is automatically maintained, it is challenging to identify substitutable reinforcers because reinforcement for the behavior is occurring internally (LeBlanc, Patel, & Carr, 2000). LeBlanc et al. (2000) also noted a function-based intervention can be challenging to implement and often a punishment procedure or an intervention that involves stimulus competition may be the more appropriate choice.

Harris and Wolchik (1979) investigated the value of three different treatments, DRO, time-out, and overcorrection. Time-out involved corrective feedback from the experimenter, followed by the experimenter turning his/her head away from the participant for 10 s. The overcorrection procedure included response interruption and physical guidance through a motor activity. The participants were 4 young boys between the ages of 4 to 7-years-old with ASD who engaged in motor stereotypy involving their

hands. The function of stereotypy was not assessed prior to the start of intervention: therefore, the maintaining variable may or may have not been addressed during either of the interventions. The results from the DRO and time out procedures were mixed. For some participants stereotypic behavior increased, some participants demonstrated a slight decrease or it did not alter stereotypy. These results indicated that these two procedures produced variable effects across participants and were not strong enough to reliably decrease stereotypic behaviors across all participants. It should be noted that the 10 s overcorrection intervention resulted in the quickest decrease in problem behavior for all participants. Interestingly, 1 participant's stereotypy was largely influenced by the overcorrection procedure in that the stereotypy was not able to return to pre-treatment baseline levels. An additional aspect of this study was the researchers assessed generalization between settings. The researcher assessed if one participant's stereotypy decreased in a play environment when the intervention (i.e., DRO, timeout, and overcorrection) was not present. The results indicated that the decrease of stereotypic behavior did not generalize to the play environment.

Richmond and Bell (1983) attempted to identify if DRO alone, simple correction (response interruption and a physical restraint procedure) alone, or presenting these two treatments as a package decreased hand-mouthing stereotypy. The study was conducted with four 24 year old women who had a diagnosis of cognitive impairment. DRO alone resulted in little change in the target behavior, whereas the simple correction procedure led to a decrease in stereotypy. However, the simple correction combined with DRO led to the greatest reduction in problem behavior when compared to the simple correction

procedure for 3 of the 4 participants. In addition, this treatment package was easy to administer and teach the staff who worked with the participants.

Bitgood, Crowe, Suarez, and Peters (1980) employed a brief immobilization technique (i.e., response interruption) to 4 children with various developmental delays all of whom engaged in motor stereotypic behaviors in addition to several other challenging behaviors. The experimenters set out to determine if the effects of the immobilization intervention for motor stereotypy would generalize to other challenging behavior without direct intervention. The results indicated that all 4 participants demonstrated a decrease in engagement in stereotypic motor movements. The results of the generalization of the intervention to non-targeted problem behavior indicated that all participants displayed a decrease in collateral behaviors ranging from a significant decrease to a minimal decrease. These two participants found incompatible behaviors to engage in throughout their generalization sessions (e.g., sitting on his hands and interlacing one's fingers in his lap). It may be possible that generalization without programming occurred because these participants were able to engage in alternative behaviors.

Interventions targeting vocal stereotypy. Previous research has focused on decreasing varying topographies of stereotypic body movements (e.g., hand flapping, body rocking, and object manipulation; Kennedy et al., 2000). Less attention has been given to the reduction of vocal stereotypy (Ahearn et al., 2007; Taylor et al., 2005).

Previous studies (Bitgood, Crowe, Suarez, & Peters, 1980; Harris and Wolchik, 1979; Richmond and Bell, 1983) had targeted stereotypic motor movements that could be physically blocked or redirected to an incompatible behavior. A challenge with vocal stereotypy is that another person cannot physically block or physically redirect the vocal

productions of another person. Redirection of vocal stereotypy is based on the compliance and vocal abilities of the individual. Though it could be difficult to redirect vocal stereotypy to other vocal productions, more recently researchers have begun to apply interruption and redirection techniques to reduce vocal stereotypy.

Dib and Sturmey (2007) conducted a study to determine if increasing the accuracy of the implementation of discrete trial teaching would affect engagement in stereotypy (both vocal and motor). Three boys, ages 9 to12-years-olds with a diagnosis of ASD engaged in vocal stereotypy as well as repetitive body movements. Three staff members with a background in behavioral teaching, but who did not implement these strategies accurately also participated in this study. An outlined procedure for increasing accuracy of implementation of discrete trial teaching was employed. The steps for teacher training included a checklist indicating the areas to consider during sessions and providing corrective feedback. Skills being taught to the children ranged from pre-academic skills (e.g., matching) to academic skills (e.g., math and writing), and leisure skills (e.g., block building). In addition to the teaching behaviors, the checklist included a section that addressed a response blocking procedure to be used for the occurrence of problem behavior. These procedures included the teacher placing a hand on the student's elbow and redirecting him back to the task in the presence of continual problem behavior. Increased accuracy in teacher implementation of the behaviors listed on the checklist led to a decrease in stereotypy during discrete trial teaching situations for all participants. According to Dib and Sturmey, one limitation of their study was the inability to distinguish between several of the procedures used for the discrete trial teaching as being responsible for the decrease in stereotypy. Although not mentioned in the study by Dib

and Sturmey, the reduction of stereotypy may have been due to the following factors; proximity of the teacher to the student may have acted as a discriminative stimulus for appropriate behavior, the quick pacing of instruction may not have allowed time for off task behavior, the potential for the motor movements to complete the task (e.g., matching) may have been incompatible with the type of stereotypy (e.g., motor stereotypy) as well as the response blocking procedure mentioned by the authors.

Previous studies have indicated that the use of a "package" intervention has been the most successful for reducing stereotypy. These packages have included (a) a simple correction procedure, which was a very valuable piece of the package (Richmond & Bell, 1983) and (b) execution of the overcorrection method (Harris & Wolchik, 1979). The modern version of a package intervention is typically referred to as response interruption and redirection procedure (Ahearn et al., 2007; Dib & Sturmey, 2007).

Response blocking and subsequent redirection to an appropriate behavior, whether in the form of overcorrection, immobilization, simple correction or contingent demands, have been effective in decreasing behaviors that are challenging to reduce, such as stereotypy. Response interruption and contingent demands can be classified as punishment-based procedures. The definition of punishment as provided by Azrin and Holtz (1966) is when "a response is followed immediately by a stimulus change that decreases the future frequency of similar responses" (as cited in Cooper, Heron & Heward, 2007, pg. 327). In each of the instances listed above, a stimulus was added which resulted in the future likelihood of the behavior decreasing. As indicated by Vollmer (1994) the reinforcer for automatically maintained behavior is typically not accessible for treatment; therefore, a punishment procedure versus a reinforcement

procedure for automatically maintained behavior seems to be the more efficient option for reduction.

Athens et al. (2008) developed a treatment package to decrease vocal stereotypy for a young boy diagnosed with Down syndrome and autism. A functional analysis (FA) was conducted prior to the implementation of the intervention. Vocal demands were presented and were similar to the demands presented during the intervention. It is worth noting that in addition to the control condition, the demand condition of the FA produced the lowest percentage of time spent engaged in the target behavior. The treatment package developed by Athens et al. consisted of noncontingent attention, contingent demands, and response cost. Each of these three components was combined differently throughout the study to determine the combination easiest to implement and the most effective in reducing vocal stereotypy. A combination of all three interventions demonstrated the largest reduction of the target behavior; however, response cost was used minimally and the noncontingent attention was faded to ease the implementation requirements. The contingent demand component was similar to the response interruption and redirection procedure described by Ahearn et al. (2007) and commonly resulted in cessation of vocal stereotypy.

Ahearn et al. (2007) employed a response interruption and redirection (RIRD) procedure to decrease vocal stereotypy in 4 young children with ASD. The redirection procedure outlined by Ahearn, which consists of engagement in three consecutive tasks, is better described as a contingent demand procedure and in the current study will be referred to as a response interruption and contingent demands procedure (RICD). The 4 participants engaged in vocal stereotypy ranging from repetitive noises to words. FAs

were conducted for all participants. Results of the FAs indicated that 2 participants had increased levels of vocal stereotypy in the alone condition, 1 participant had increased levels in the play condition, and 1 participant had undifferentiated results. All participants demonstrated lower levels or decreasing levels of vocal stereotypy in the demand condition. Throughout the study, data were collected on vocal stereotypy and appropriate vocalizations. The RIRD procedure consisted of having the student engage in some form of vocal behavior based on the occurrence of vocal stereotypy. The form of RIRD was based on the student's verbal repertoire (e.g., imitative vocalizations or answering social questions). The results indicated that the RIRD procedure was effective in decreasing vocal stereotypy for all participants and increasing appropriate vocalizations for 3 of the 4 participants. Ahearn et al. noted that vocal stereotypy occurred less during the demand condition of the FA where only non-vocal demands were used, whereas the RIRD procedure used only vocal demands. Future research should examine the type of demand (i.e., vocal vs. non-vocal) used during the RIRD procedure.

Liu-Gitz and Banda (2010) conducted a replication of the Ahearn et al. (2007) study with some procedural differences. The results of the FA indicated vocal stereotypy for this participant was automatically maintained. The demands presented during the RIRD procedure were vocal demands. Unlike in the Ahearn et al. study, the classroom teacher implemented the intervention and sessions were conducted in the classroom. As with other studies using the RIRD procedure (Ahearn et al.; Athens et al., 2008), this study also demonstrated a decrease in vocal stereotypy.

Purpose

The purpose of this study was to decrease automatically maintained vocal stereotypy in children with autism using a response interruption and contingent demands procedure (RICD). Procedures included participation in a functional analysis, a preference assessment, and the intervention based on the procedures outlined by Ahearn (2007) with a few notable exceptions. The demand condition of the functional analysis included both vocal and non-vocal demands alternating based on whichever demand was given previously. Another important difference was the addition of non-vocal demands as a separate RICD condition as well as using a vocal demand condition. The comparison of vocal and non-vocal demands was examined to identify an intervention that would be applicable for students with a range of vocal abilities. Not all students who engage in vocal stereotypy possess the vocal repertoire to answer simple social questions or imitate sounds/words on command, while the use of non-vocal demands can be prompted regardless of vocal abilities.

Research Questions

This study addressed the following questions:

1. Will a non-vocal RICD procedure decrease the occurrence of vocal stereotypy in children with ASD compared to the decreases observed using a vocal RICD procedure?

2. What are the teachers' opinions regarding the use of the RICD procedure as a means to decrease vocal stereotypy?

Chapter 2: Method

Participants and Setting

Two young girls with a diagnosis of autism spectrum disorder participated in this study. Participants were selected for this study based on their diagnosis of ASD and frequent episodes of vocal stereotypy. Prior to the commencement of study, the Institutional Review Board (IRB) of The Ohio State University granted its approval of all research protocols. For one participant, a consent process from the school district was also required and obtained. Written consent was obtained from each participant's parent prior to inclusion in this study. Teacher consent was also obtained when participants were identified Violet was a 10-year-old girl in a classroom for students with multiple disabilities in a public school in Columbus, Ohio. Violet minimally engaged in spontaneous vocal speech and would only expand her length of utterance when prompted with a model of the appropriate language. Violet's vocal stereotypy typically consisted of repetitive sounds, laughter, or a repetition of phrases centered around a video or television program (e.g., shouting the names of TV shows, movies, or characters from TV shows or movies). Normally, occurrences of vocal stereotypy were loud in nature. Sessions for Violet were conducted in a small conference room equipped with a table, chairs, and a small desk. Cabinets and a countertop were also part of the structure of this conference room. Because other professionals in the building sometimes needed access to

the conference room, some of Violet's sessions were conducted across the hall in a small room used for reading tutelage. This room contained a table, chairs, a bookshelf, a desk, and reading materials.

Stella was a 12-year-old girl who spent lunch, recess, and specials (e.g., art, music and gym) in her general education classroom with 1:1 assistance and the remainder of the day in a resource room in a suburban public school. Stella usually made requests or responded to a question with a single word phrase unless prompted to respond with a four to six word sentence. Stella's vocal stereotypy typically consisted of repetitive sounds and phrases. These phrases were usually names from current pop culture, types of candy, or longer phrases that were difficult to discern. Stella's vocal stereotypy was usually at a low volume. Sessions for Stella were conducted in a partitioned area within her resource room. A desk and chair were located in the partitioned area. In Stella's case, the teacher and classroom aide were instructed not to address episodes of vocal stereotypy or engage with her in any way during the sessions.

Preferred stimuli chosen through the preference assessment were available between sessions. Pen, pencil, simple worksheets, blank paper, flashcards (e.g., colors, shapes, and object labels), an audio-recorder to record the sessions, and a session clock were present during sessions for both participants.

Dependent Variable

Vocal stereotypy was the dependent variable. Vocal stereotypy was defined as any non-contextual vocalization. These vocalizations ranged from sounds to full sentences. Examples included repetitive sounds, words, or requests (e.g., participant made an initial request for piece of paper, then made the same request one or more times

prior to receiving the paper). They also included phrases that occurred out of the context of the materials present, the current activity or ongoing conversation (e.g., "la la la" or "Don't touch it, it's hot!" while the class completed a math activity). This did not include a single instance of a scripted phrase made in the correct context (e.g., "It's time for recess." while the class lined up for recess), made an appropriate request (e.g., "Can I have a drink?") or answered a request (e.g., "Brown" in response to "What color is the door?").

Response Measurement

Data were collected using a paper data sheet, pen/pencil, timing device and audio recorder. The primary observer and two secondary data collectors collected data throughout the study. A master's student and doctoral candidate served as second observers. Data collection procedures were conducted as outlined in the study by Ahearn et al. (2007). During the functional analysis, a 10 s momentary time sampling procedure was used to track the occurrence or non-occurrence of vocal stereotypy (See Appendix C). Following each 10 s interval, the experimenter had 2 s of recording time for the presence or absence of vocal stereotypy. During the treatment analysis, a 10 s partial interval measure was used to track the occurrence of vocal stereotypy (See Appendices J and K). Following the completion of the session, intervals engaged in the target behavior were divided by the total session intervals and then multiplied by 100 to give a percentage of time engaged in vocal stereotypy for that session. Sessions were scored by listening to the session recorded using the audio-recorder and the stop clock. An appropriate interaction was considered any appropriate request (e.g., "Can I have a snack?", "I need a pencil.") or appropriate comment (e.g., laughter in response to a peer

telling a joke). All appropriate interactions were noted using a frequency count during the treatment analysis.

Interobserver Agreement

The secondary observers scored several of the baseline sessions in-situ while the majority of baseline and all of intervention sessions were scored outside of session time by listening to an audio recording of the session using a session clock and data sheet identical to that being used by the experimenter. Interobserver agreement (IOA) data scored by the secondary observers were compared to the data collected by the primary observer. An agreement was scored each time the experimenter and the observer agreed on the occurrence or absence of the behavior and also the number of times the intervention procedure was implemented during the same interval. IOA were collected for 20% to 37% of all conditions for both participants.

Four types of IOA were collected: exact count-per-interval, interval-by-interval, scored interval, and unscored interval. For all IOA sessions in which the RICD procedure was implemented, exact count-per-interval IOA was calculated. To determine exact count-per-interval IOA, the number of intervals in which the exact number of times the RICD procedure was implemented were divided by the total number of intervals in which RICD was scored and then multiplied by 100. The percentage of interval-by-interval IOA was calculated by taking the total number of intervals in which agreement occurred, divided by the number of intervals with agreement plus the number of intervals with disagreement, then multiplied by 100. To verify that interval-by-interval IOA did not over or underestimate overall agreement, scored-interval IOA and unscored-interval IOA were calculated. Scored-interval IOA was determined by totaling the number of times the

primary and/or secondary observer indicated the occurrence of the behavior. Agreement between both observers was divided by the total number of intervals in which agreement was noted plus those intervals in which only one observer noted the occurrence of the behavior multiplied by 100. Unscored-interval IOA was calculated by totaling the number of times the primary and secondary observer indicated the behavior did not occur during the interval. The total number of times both observers agreed the behavior did not occur was divided by the total number of times the observers agreed the behavior did not occur plus the number of times one of the observers indicated the absence of the behavior multiplied by 100 (Cooper, Heron, & Heward, 2007). All IOA scores calculated were then averaged across sessions for each participant by study condition. Table 2.1 displays the percentage of sessions in which a secondary observer collected data on the occurrence of vocal stereotypy and implementation of the RICD procedure, and the means and ranges of IOA for each type of agreement calculated during each condition of the study for each participant. The exact count per interval IOA represents agreement for the number of times the RICD procedure was implemented per interval and the remainder of IOA represents agreement on the occurrence or nonoccurrence of vocal stereotypy per interval.

IOA for Violet was collected during 26% of baseline sessions, 31% of non-vocal sessions, and 33% of vocal sessions. IOA for Stella was collected during 25% of baseline sessions, 37% of non-vocal sessions, and 40% of vocal sessions.

	Violet			Stella		
	BL	Non-Vocal	Vocal	BL	Non-Vocal	Vocal
% of sessions	26%	31%	33%	25%	37%	40%
Exact count per interval	n/a	81% (50-100%)	100%	n/a	86% (33-100%)	100%
Interval-by-interval	99% (93-100%)	99% (97-100%)	100%	96% (86-100%)	100%	100%
Scored-Interval	99% (93-100%)	93% (80-100%)	100%	91% (63-100%)	86% (33-100%)	100%
Unscored-Interval	99% (94-100%)	98% (95-100%)	100%	85% (67-100%)	99% (92-100%)	100%

Table 2.1. This table contains the percentage of sessions IOA was collected, IOA means and ranges (in parentheses) for Violet and Stella during baseline and intervention phases.

Procedures

Preference assessment. A multiple stimulus without replacement (MSWO) preference assessment was conducted for Violet and Stella (DeLeon & Iwata, 1996). A free operant preference assessment (Roane, Vollmer, Ringdahl, & Marcus, 1998) was also conducted for each of the participants because both displayed a side preference during the MSWO. Items used in the preference assessment were determined by interviewing the participants' parents/guardians and teachers. Prior to the preference assessment, the participant was allowed to experience each stimulus. The participant had access to leisure activities (e.g., puzzle, spinning toy, etc.) for 30 s and had the opportunity to consume a small sample of each edible. The MSWO consisted of placing five stimuli at a time in a row on a table or desk. The stimuli were spaced evenly to prevent an inadvertent prompt toward one reinforcer over another. Each participant was

instructed to “pick one,” and allowed to consume the edible or have 30 s of access to a tangible stimulus. After the participant chose a stimulus, it was not replaced in the lineup. The remaining stimuli were re-ordered to eliminate any space from the selection and removal of the stimulus. The termination criterion for this procedure was 30 s of non-selection from the remaining array. Each stimulus selection was marked in the order it was chosen and the remaining stimuli were marked as “not selected.” This method of preference assessment was chosen to allow a reinforcer hierarchy to be established for each participant.

Though Stella tended to favor the left side of the array, she did have a preference when presented with tangible materials. The results of Stella’s preference assessment indicated that Kit Kat’s were her most preferred edible reinforcer as it was the only item consumed despite a full array of preferred choices. Due to Violet’s repeated selection of all items on the left hand side and Stella’s selection of edibles on the left hand side of the array, despite re-ordering of items, these same items were presented in a free operant preference assessment. This assessment allowed the participants access to 5 items for the duration of 5 minutes. Participant interaction with the items was measured using a 10 s partial interval recording. If an item was depleted from the array, it was immediately replenished.

Reinforcers were provided to the participants based solely on completion of the sessions and not based on performance within the sessions themselves.

Functional analysis. An analogue functional analysis was conducted for each participant using procedures similar to those described by Iwata et al. (1982/1994). The functional analysis consisted of three test conditions (i.e., attention, demand, and ignore)

and one control condition (i.e., unstructured play). All sessions were 5 min in length (Northup et al., 1991) and participants were allowed to move freely around the room in-between each session to help with discrimination between conditions. A maximum of four sessions were conducted per day.

Ignore. During the ignore condition, the experimenter was present in the room with the participant. The experimenter was seated away from the participant and was engaged in an independent task (e.g., writing a letter or reading a book). All materials were removed from the room. There were no contingencies in place for vocal stereotypy, other inappropriate behavior, or appropriate behavior.

Attention. During the attention condition, the experimenter provided the participant with an array of moderately preferred toys. The experimenter was seated away from the participant and engaged in an independent activity (e.g., writing a letter or reading a book). Contingent on the occurrence of vocal stereotypy, the experimenter provided attention to the participant for 15 s. This attention was in the form of a brief reprimand, such as "Don't talk about things like that!" or "I don't like it when you talk about things like that." A script was provided to the experimenter to use to assist in the generation of enough phrases for 15 s of attention. There were no contingencies in place for appropriate behaviors or other inappropriate behaviors.

Demand. In the demand condition, tasks were individually selected for each participant based on vocal and motor abilities as reported by the teacher. Vocal and non-vocal tasks were alternated throughout this condition. The non-vocal tasks were presented using a three-step, least to most, prompting strategy (e.g., verbal, model, and physical prompts). A verbal prompt was initiated and brief praise (e.g., "Good job!", "That's

right!") was provided for compliance. If the participant made no response for 3-5 s or an incorrect response occurred, the next prompt level was used (e.g., model or physical). Contingent on vocal stereotypy, the experimenter ceased the demand, removed any task materials, and turned away from the participant for 15 s. At the end of the 15 s, a new vocal demand was presented following the procedures described below.

The vocal tasks presented to the student were chosen based on vocal and abilities as reported by the teacher. Examples of vocal tasks might include imitating simple verbalizations (e.g., "Say /t/" or "Say ball.") or answering questions related to flashcards (e.g., "What color?" while presenting a flashcard of a color). Due to the inability to prompt a vocal task to completion, the experimenter continued to restate the demand (e.g., "Say horse.") every 3-5 s until the participant engaged in the correct response or in vocal stereotypy. Engagement in vocal stereotypy resulted in the demand being removed and the experimenter turned away from the participant for 15 s. Following the 15 s, a new non-vocal demand was presented. Vocal and non-vocal demands were alternated to keep consistency between the FA and the treatment protocol.

Play. During the play condition, preferred items were freely available during the session. The experimenter provided attention in the form of verbal praise on a 30 s fixed-time schedule. The experimenter could interact with the participant if the participant initiated the interaction. There were no contingencies in place for appropriate or other inappropriate behaviors.

Treatment analysis. After the participant completed the FA, a treatment analysis was conducted to reduce the occurrence of vocal stereotypy. The treatment consisted of comparing the type of demand (i.e., vocal versus non-vocal) used during the response

interruption and redirection (RIRD) procedures described by Ahearn et al. (2007). Sessions were 5 min. Each time the RICD procedure was implemented the session clock was stopped. The session clock was restarted after the participant complied with three demands without the occurrence of vocal stereotypy. This allowed for the amount of time that the participant was able to engage in vocal stereotypy to be consistent across sessions. Though the sessions were 5 min, the total amount of time spent per session varied due to the frequency the participant engaged in vocal stereotypy and the participant's compliance to the demands presented. The range of session minutes for Stella was 5 min to almost 10 min and the range for Violet was 5 min to 58 min. In the case of Stella, sessions averaged 6.1 min and in Violet's case, the average session was 16 min.

Baseline. This condition was similar to the ignore condition of the FA with the exception that appropriate vocalizations could result in a response from the experimenter. Each session was 5 min. The experimenter did not provide feedback to the participant for any inappropriate behavior or vocal stereotypy. During the session, the experimenter sat within approximately 2-4 feet of the participant. Baseline data were collected until the data demonstrated stability or an increasing trend.

An additional procedure was added during the final baseline phase for Stella due to the inability to recover previous baseline levels of vocal stereotypy after the second non-vocal demand intervention. During the baseline 2 condition, Stella was given access to a preferred item during the 5 min baseline sessions.

Vocal Demand. During this condition, if the participant engaged in vocal stereotypy the experimenter interrupted the participant (e.g., "No [name]" or "Nope, let's

try again.") and redirected her to engage in contingent vocal demands. The vocal demand could be a social question (e.g., "How old are you?") or imitation of sounds/phrases (e.g., "Say 'horse'" or "Say 'baa'"), based on the participant's vocal abilities. The participant was prompted to respond three consecutive times without engaging in vocal stereotypy before being praised for engaging in appropriate vocalizations. An example might look like this; (participant engages in vocal stereotypy) experimenter says, "No. Let's try again. How old are you?" Participant says, "12." Experimenter says, "What is your favorite color?" participant says, "pink." Experimenter says, "Say princess." Participant says, "princess." Experimenter says, "Fantastic!" Any appropriate vocalizations were addressed with positive praise statements (e.g., "Thank you for telling me you needed a drink.") and if a request was made, it was honored if possible. For both participants, the experimenter did not need to address any appropriate vocalizations due to the lack of appropriate vocalizations directed toward the experimenter. Occasionally, Violet labeled the items presented during the non-vocal demand condition and Stella would say, "excuse me" in response to bodily sounds.

The types of vocal demands presented to Violet typically were asking her to repeat a word as she did not reliably answer questions. Stella was presented with a flashcard and was asked to either repeat the label assigned by the experimenter (e.g., "Say circle") or identify the picture when given the instruction "What is it?"

A change to this condition was made for Stella in order to compare the intervention to the baseline 2 condition. During the vocal demand 2 intervention, Stella was given access to a preferred item during each session, while the treatment procedures remained intact.

Non-vocal demand. In the non-vocal demand condition, contingent on the participant engaging in vocal stereotypy, the experimenter had the participant engage in contingent motor tasks. These tasks were chosen based on reports from the teacher and the tasks that were used during the demand condition of the FA. The participant was required to respond three consecutive times without engagement in vocal stereotypy before exiting the RIRD procedure. Praise for completing the tasks was intermittently delivered. An example might look like this; the participant engages in vocal stereotypy, the experimenter states, "Nope, let's try again (name). Trace" and presents tracing materials to the participant. The participant engages in the correct response. Experimenter says, "Nice job!" The experimenter presents the next demand, "Do this" and the experimenter stomps her feet, and the participant imitates the motor response. The participant engages in vocal stereotypy again. The experimenter presents a new demand, "Clap your hands." The participant engages in the correct response. The experimenter presents the second demand, "Trace the cloud." The participant engages in the correct response. The experimenter says, "Great working!" The experimenter presents the third demand "Trace" and presents a tracing worksheet and pencil. The participant engages in the correct response. The experimenter provides a praise statement, "You got it!" in an excited voice.

Motor activities for Violet included tracing letters, numbers, and shapes as well as engagement in a gross motor task (e.g., clapping hands, tapping the table, stomping feet, etc.). Activities for Stella included writing simple words, drawing simple shapes, and tracing letters, numbers, and shapes.

If during either condition, the participant made a response to the demand devoid of vocal stereotypy, but that response was incorrect, it was still counted toward the total number of responses needed for the participant to exit the RICD procedure. Examples of incorrect responses may include answering the question "What is your name?" with someone else's name or drawing a simple picture instead of tracing her name when presented with a non-vocal task.

Experimental Design

A multi-element design was used during the FA. The treatment analysis for Violet was conducted using a reversal design (e.g., ABACABAC). Where A was baseline, B was the non-vocal demand and C was the vocal demand condition. A reversal design for Stella was also used; however, the introduction of an additional procedure altered the design (e.g., ABACABADE). Where A, B and C were identical to the conditions for Violet, D was baseline plus access to a preferred item and E was the vocal demand condition plus access to a preferred item. Upon achieving a stable baseline, the intervention (i.e., RICD vocal or non-vocal demand) was introduced for each participant. When the dependent variable for each participant reached a stable or downward trend, a return to baseline occurred. Following a return to baseline, the participant was exposed to the alternate independent variable and the cycle continued. The re-introduction of the independent variable with return to baseline conditions was done to demonstrate the effectiveness of this procedure in decreasing vocal stereotypy and to demonstrate experimental control.

Procedural Integrity

Procedural integrity data were collected for 25-40% of all sessions. A procedural integrity checklist (See Appendices D and E) listing the procedural steps that were to be completed during each session was used throughout the baseline, non-vocal intervention, and vocal intervention sessions. An explanation of the data sheet was provided to the observer along with a definition of vocal stereotypy, which included any non-contextual verbalizations or vocalizations that occurred in the same time frame. An episode of vocal stereotypy was considered complete when 3 s or more had passed without the occurrence of vocal stereotypy. In baseline conditions, the observer indicated the appropriateness of distance between the experimenter from the participant, whether or not the experimenter provided feedback for vocal stereotypy, other inappropriate behaviors, and appropriate vocalizations. During the vocal and non-vocal conditions, the observer indicated each of the following: (a) each time the participant engaged in vocal stereotypy, (b) if the experimenter stopped the session clock, (c) if the experimenter presented the demand until the participant completed three demands without the occurrence of vocal stereotypy, (d) if the session timer was restarted, and (e) if the experimenter responded to any appropriate vocalizations. The data were used to calculate a percentage of steps completed correctly.

Procedural integrity was assessed for Violet during 34% of baseline sessions, 31% of non-vocal sessions, and 33% of vocal sessions. Integrity was 100% for all sessions. Procedural integrity was collected for Stella during 25% of baseline sessions, 26% of non-vocal sessions, and 40% of vocal sessions. Integrity was 100% for all sessions.

Social Validity

A questionnaire was given to the teacher of each participant to assess social validity (See Appendix L). The questionnaire was distributed following the final intervention session and contained four questions based on a 1-5 point Likert-type scale. General classroom disruption from implementation of the procedure, willingness to adopt new classroom procedures, the level of change in vocal stereotypy, and the likelihood this procedure would be recommended to other special educators were asked on the questionnaire.

Violet's teacher felt her classroom routines were not disrupted and she would definitely be willing to alter the way she interacts with Violet in order to implement these procedures. Her teacher also felt the behavior definitely decreased and she would definitely recommend these procedures to another special education teacher. Stella's teacher also felt there were not any disruptions to her classroom, and would consider changing how she interacts with Stella to implement these procedures. The teacher felt neutrally regarding the impact on Stella's behavior and would consider sharing these procedures with other special educators who have students that engage in vocal stereotypy.

Chapter 3: Results

Functional Analysis

The functional analysis results for Violet are depicted in Figure 3.1. Data were collected over 5 days with a maximum of four sessions per day. Violet displayed high and fairly stable levels of vocal stereotypy in the play condition (M = 63%; range, 43% to76%) relative to the other conditions. Vocal stereotypy in the ignore condition was slightly lower and a little more variable than during the play condition (M = 57%; range, 31% to 93%). Variable levels of vocal stereotypy were observed in the attention condition (M = 39%; range, 0% to 83%). During the attention condition, vocal stereotypy decreased during the first three sessions, then began to increase across the remaining sessions. During the escape condition, vocal stereotypy was also variable (M = 48%; range, 13% to 96%). Similar to the attention condition, Violet's vocal stereotypy decreased across the FA sessions, until the final session in the escape condition, where vocal stereotypy increased. Results suggest that Violet's vocal stereotypy was likely maintained by automatic reinforcement.

Figure 3.2 displays the results of Stella's functional analysis. Data were collected over 8 different days with a maximum of four sessions per day. Stella displayed moderate and stable levels of vocal stereotypy during the play condition, with the exception of one increase mid-way through the FA (M = 34%; range, 17% to 67%). The data represented in the ignore condition were at a lower level than those in the play condition and had an

initial increasing trend that peaked at the same level as the play condition, followed by a decreasing trend (M = 27%; range, 6% to 67%). An initially variable, but increasing trend was observed during the attention condition that peaked in the same place as the previous conditions, then dropped and increased slightly by the final FA session of this condition (M = 36%; range, 17% to 73%). The escape condition resulted in slightly variable data of a lower level than all other FA conditions (M = 17%; range, 0% to 30%). Results indicated Stella's vocal stereotypy was likely an automatically maintained behavior.

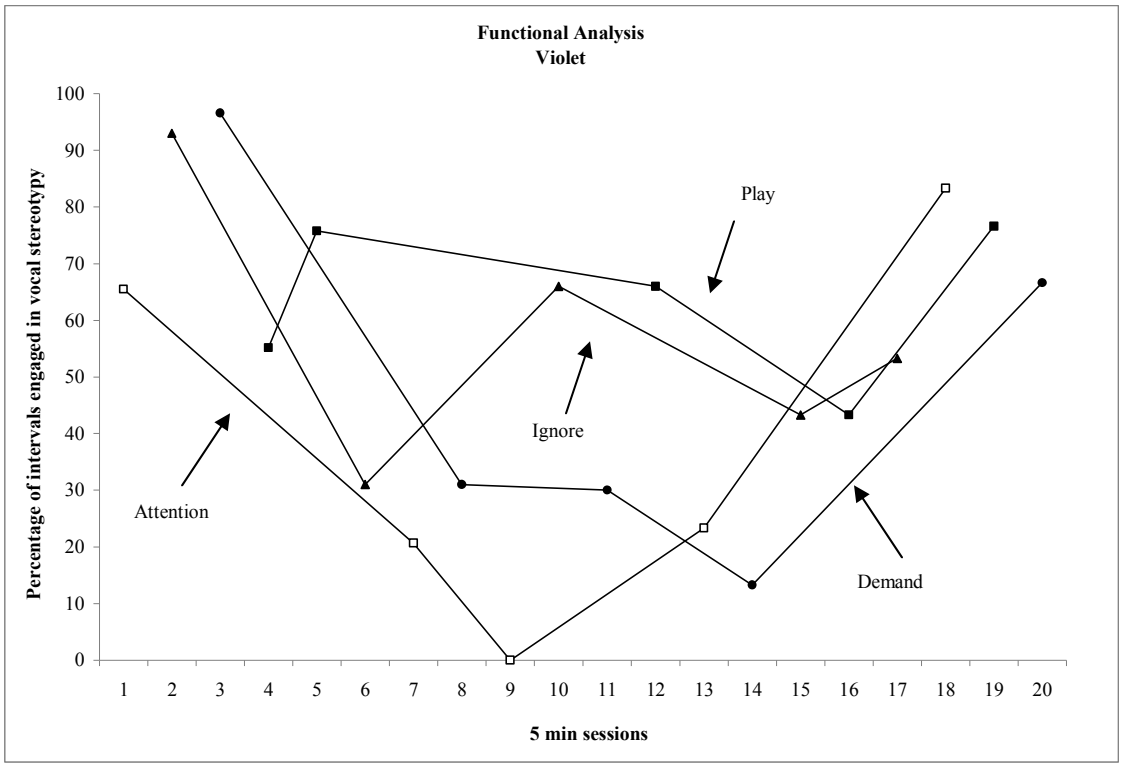

Figure 3.1. Results of functional analysis for Violet.

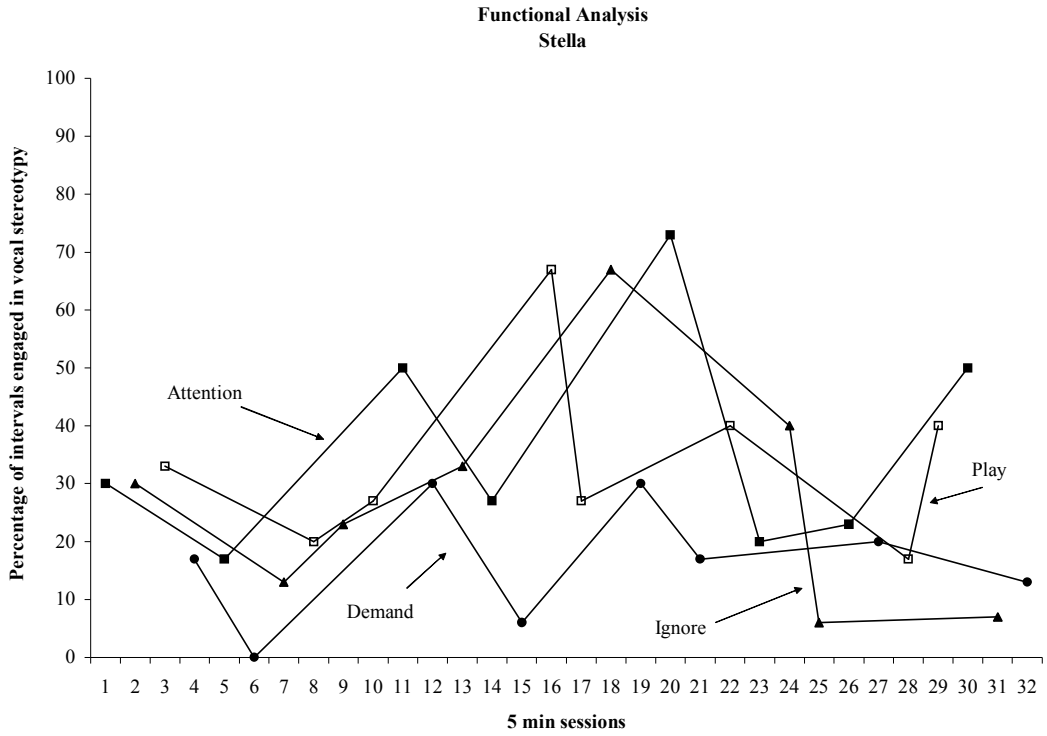

Figure 3.2. Results of functional analysis for Stella.

Treatment Analysis

Graphs reviewed below contain information regarding the percentage of time spent engaged in the target behavior, the total time spent in session, and the number of times the RICD procedure was implemented.

Figure 3.3 displays the percentage of intervals Violet engaged in the target behavior throughout all phases of treatment. Initial baseline data indicated an increasing trend in vocal stereotypy (M = 57%; range, 23% to 90%) prior to the introduction of the first phase of treatment, non-vocal RICD. Though variable, the overall data path in the first non-vocal RICD phase had a decreasing trend (M = 32%; range, 20% to 50%). The return to the second baseline following the first implementation of the non-vocal RICD

procedure resulted in an increase in the percent of time engaged in vocal stereotypy. Additionally, nine of the 13 data points were at 70% or above (M = 95%; range, 33% to 100%). The first implementation of the vocal RICD resulted in a sharply decreasing trend in a total of five sessions (M = 29%; range, 3% to 83%). The third baseline phase was again variable, though with an overall change in level, seven of 13 data points were above 70% (M = 66%; range, 3% to 100%). Upon the introduction of the second non-vocal RICD procedure, another rapid decrease in the target behavior was noted (M = 9%; range, 0% to 27%). An increasing trend and upward change in level during the fourth baseline phase (M = 78%; range, 73% to 97%) prompted the transition to the second and final vocal RICD sessions. Violet responded to the vocal RICD procedure quickly and in the final two sessions, she did not engage in vocal stereotypy (M = 8%; range, 0% to 20%).

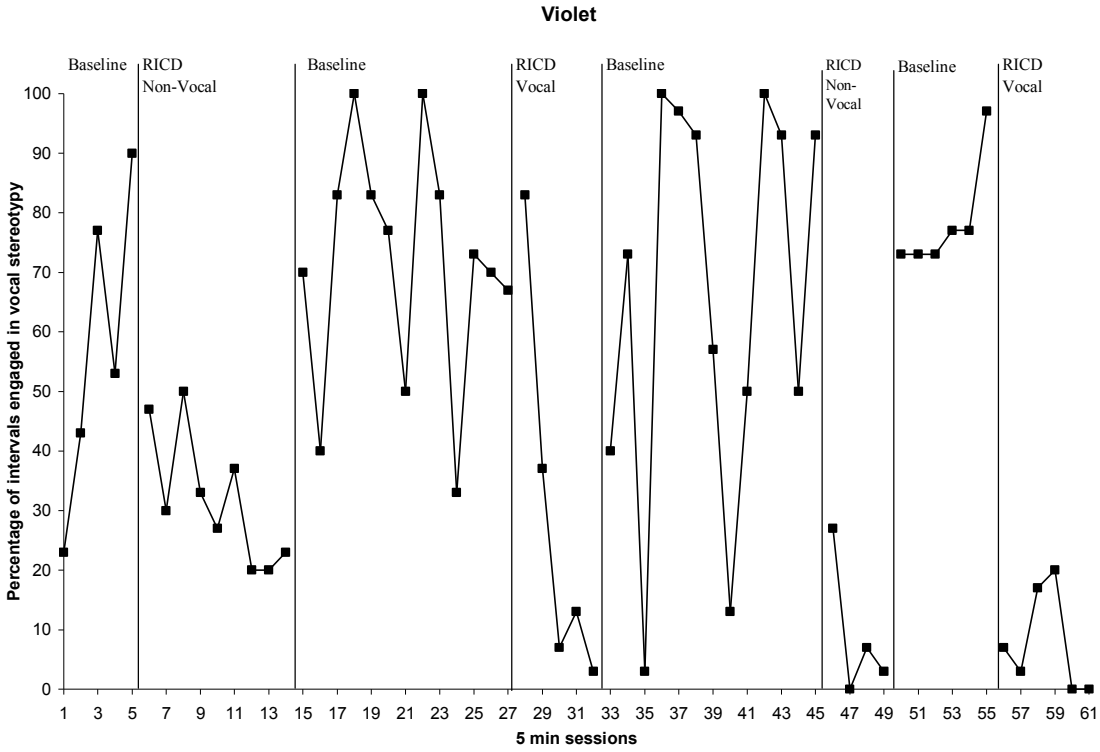

Figure 3.3. The percentage of intervals with vocal stereotypy across baseline, non-vocal RICD, and vocal RICD sessions.

Figure 3.4 displays the total time spent in each session throughout the study. All baseline sessions were five min. The introduction of the first non-vocal RICD procedure resulted in multiple episodes of non-compliance and therefore increases in the duration of sessions (M = 23 min; range, 10 min to 42 min). The subsequent introduction of the first vocal RICD procedure resulted in a rapid decrease in the amount of total time spent in session with the exception of one session (M = 23 min; range, 5 min to 58 min). Session 29 had several periods of non-compliance that resulted in a total session time of 58 minutes. In the final two intervention phases non-compliance was no longer a

contributing factor to the total time spent in session and any variation was an artifact of Violet continuing to engage in vocal stereotypy during the implementation of the RICD procedure. The four sessions in the second non-vocal RICD condition showed an overall decreasing trend in the total time spent in session and were 13 min, 5 min, 11 min and 7 min respectively (M = 9 min). Compliance to the RICD procedure led to a low and stable level of total time spent in session for the second and final vocal RICD intervention (M = 5.5 min; range, 5min to 6 min).

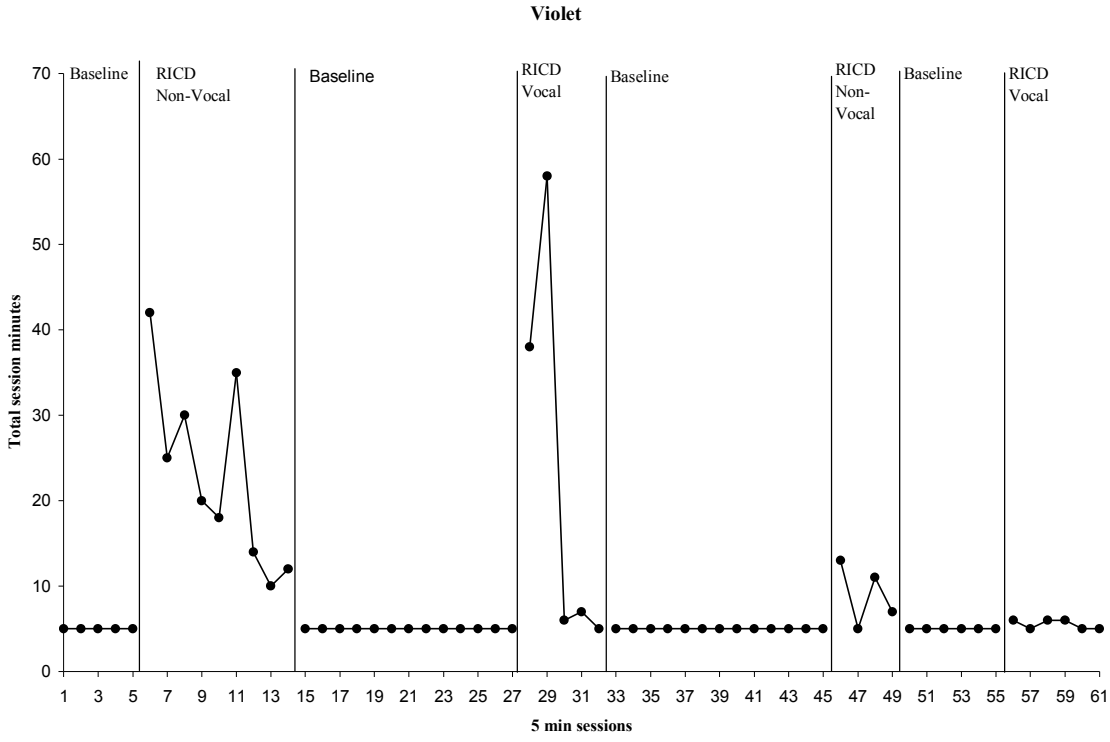

Figure 3.4. Total minutes for each session during baseline, non-vocal RICD, and vocal RICD sessions for Violet.

The total number of times the RICD procedure was implemented is presented in Figure 3.5. During all baseline sessions the total times the procedure was implemented is zero. Despite episodes of non-compliance, the number of times the RICD procedure was implemented during the first non-vocal RICD phase decreased overall from 21 implementations to nine implementations (M = 14; range, 9 occurrences to 21 occurrences). The initial sessions of the first vocal RICD phase were characterized by increased noncompliance. During session 29, even when compliant Violet tended to shout her responses following prompts to repeat words on a flashcard. Following attempts to rip up the flashcard and aggression toward the experimenter, the vocal requirement was shifted from the presentation of a word related to a flashcard (an activity during the functional analysis), to asking her to repeat words that were related to preferred items and words related to the physical surroundings of the room (e.g., “princess”, “snow white”, “chair”, “t-shirt”, etc). Following this session non-compliance and the frequency with which the RICD procedure was implemented steadily decreased (M = 13). The second non-vocal RICD phase showed an overall decrease in trend and level (M = 3; range, 0 occurrences to 8 occurrences). The second and final implementation of the vocal RICD procedure resulted in an initial increasing trend followed by a sharp decline in the number of times the procedure was implemented (M = 2; range, 0 occurrences to 6 occurrences).

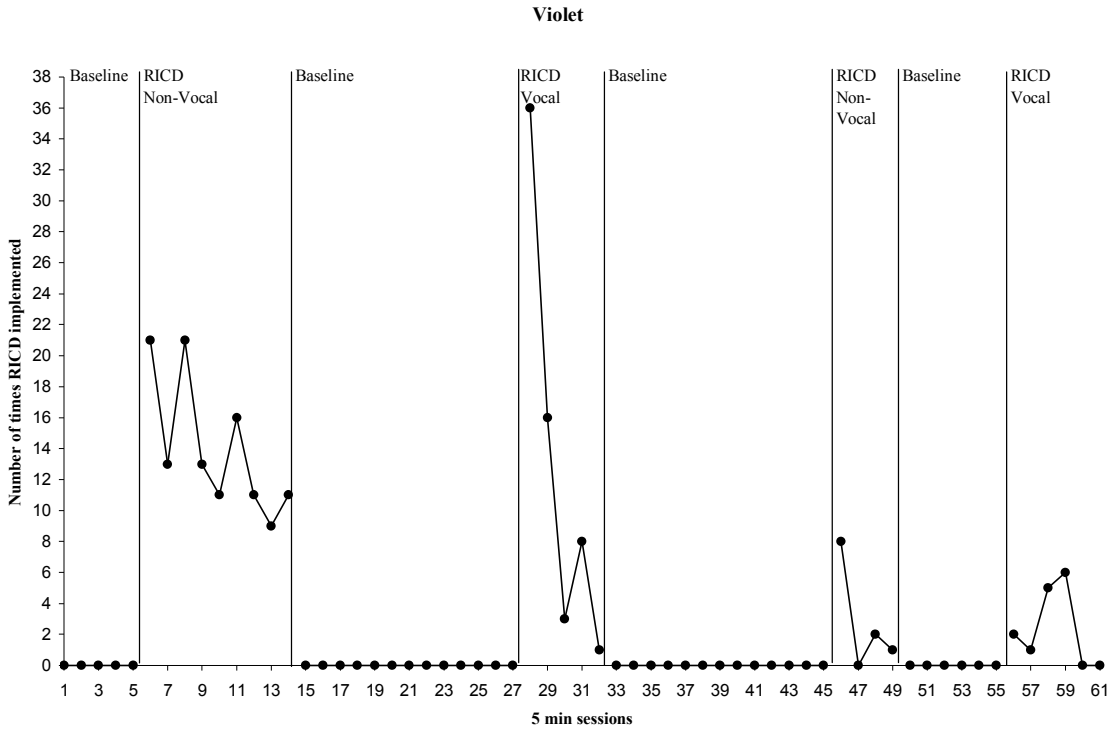

Figure 3.5. Total number of times the RICD procedure was implemented for Violet.

Figure 3.6 represents the percentage of intervals that Stella engaged in vocal stereotypy. During the first baseline condition, Stella engaged in vocal stereotypy an average of 55% of the intervals (range, 20% to 93%). During the first non-vocal RICD session the variability lessened. A marked decrease in level was noted in the first non-vocal RICD condition as compared to the first baseline condition. Thirteen of 24 data points were at 10% or lower during the non-vocal RICD condition (M = 12%; range 0% to 30%). Following the first non-vocal RICD condition a return to a second baseline recaptured her vocal stereotypy at pre-treatment levels (M = 40%; range, 0% to 90%). Prior to the beginning of session 52, Stella's teacher indicated she had been "very quiet"

throughout the day. During session 53, Stella laid her head in her hands, with eyes half closed for the majority of the session. Again, there was large variability in the data path; however, there was an overall increase in the level from the first non-vocal RICD to the second baseline condition. The first vocal RICD condition resulted in a decrease in the percentage of intervals spent engaged in the behavior (M = 5%; range, 3% to 13%). It took several sessions to regain pre-treatment levels for the third baseline phase, but an increase in level was noted prior to the introduction of the second non-vocal RICD phase (M = 26%; range, 0% to 63%). With the exception of two spikes in percentages (sessions 85 and 88, respectively) the remainder of the sessions were below 3% for the second non-vocal RICD phase (M = 3%; range, 0% to 17%). The return to the fourth baseline phase did not recapture previous baseline levels, with sessions 94 through 97 being consumed with a lip chewing behavior (M = 7%; range, 0% to 13%). Throughout the study, it had been noted that upon receiving access to her reinforcer for participation in the sessions, vocal stereotypy became more frequent. An additional procedure was implemented for a fifth baseline phase, indicated as baseline 2, in which Stella was given her choice of preferred reinforcer (e.g., barrel of monkeys, teen magazines, or a light up ball) and allowed to engage with this item during the session. During baseline 2, there was an immediate return to previous baseline levels of vocal stereotypy (M = 59%; range, 43% to 93%). The subsequent return to the final vocal RICD condition included Stella's access to preferred reinforcers during the sessions and is labeled RICD vocal 2. An immediate decrease and level was noted and a stable data path was established (M = 5%; range, 3% to 7%).

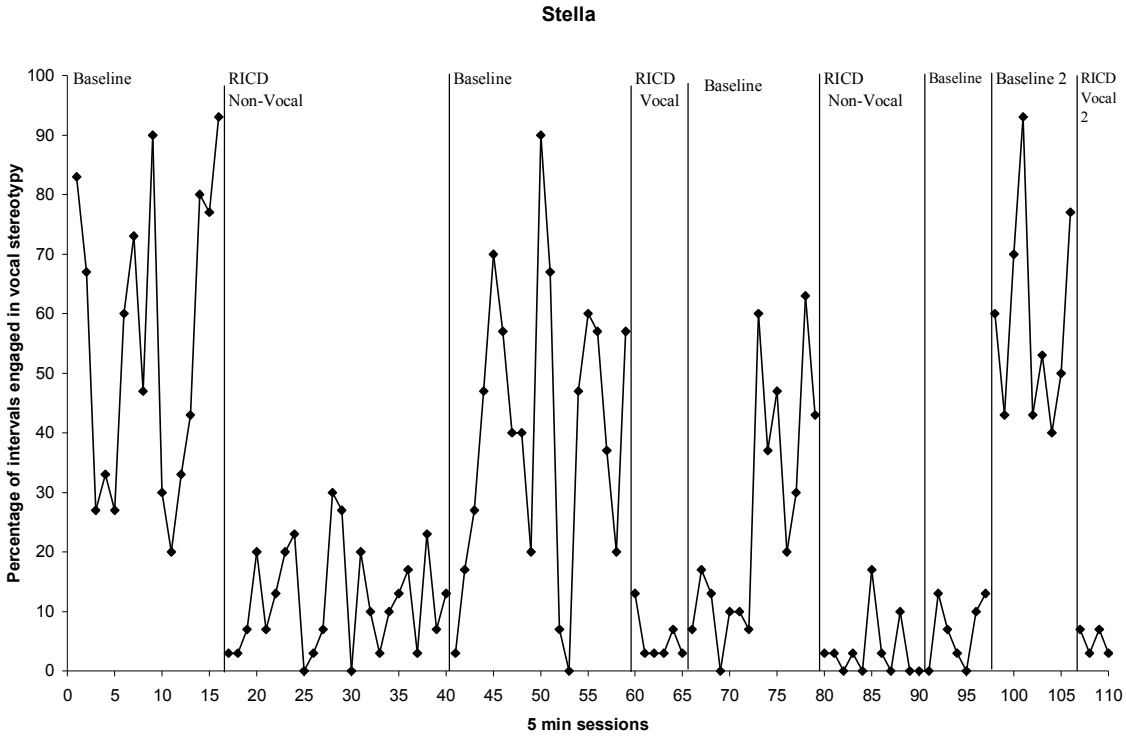

Figure 3.6. The percentage of intervals with vocal stereotypy across baseline, non-vocal RICD, and vocal RICD sessions.

Figure 3.7 represents the total time spent during sessions for Stella. Throughout the study, engagement in non-compliant behaviors was not a time inflating variable; therefore, to note any true changes in total time spent in sessions, seconds versus minutes were recorded. All baseline sessions were no more than 300 s (five min). During the first introduction of the non-vocal RICD procedure, total session time was highly variable although variability decreased across this condition (M = 370 s; range, 300 s to 590 s). The first introduction of the vocal RICD procedure resulted in an overall significantly lower level than the first non-vocal phase and produced a stable amount of time in

session (M = 314 s; range, 305 s to 334 s). The second non-vocal phase was slightly variable though lower in overall level than the first non-vocal phase. This phase was more variable than the previous vocal RICD phase (M = 318 s; range, 300 s to 366 s). The second vocal RICD (i.e., RICD vocal 2) phase resulted in a stable data path (M = 313 s; range, 306 s to 320 s).

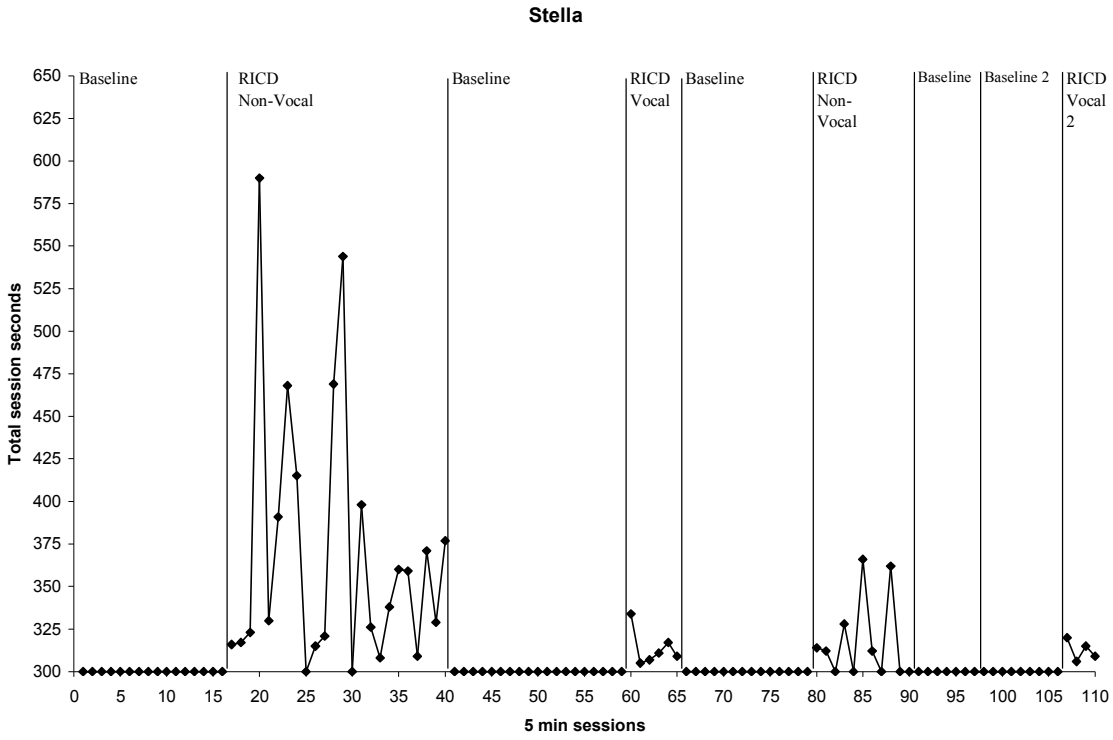

Figure 3.7. Total seconds for each session during baseline, non-vocal RICD, and vocal RICD sessions for Stella.

The number of times the RICD procedure was implemented is represented in Figure 3.8. The first non-vocal condition resulted in variable data, with the number of times the RICD procedure was implemented ranging from 0 to 11 occurrences (M = 4 occurrences). During the initial session of the first vocal RICD condition, the procedure was implemented on five occasions and then decreased to one occurrence and stabilized for the duration of the condition (M = 2 occurrences; range, 1 occurrence to 5 occurrences). The second non-vocal RICD condition did result in a decrease in overall level as compared to the first non-vocal RICD condition, though similar variability was noted (M = 1 occurrence; range, 0 occurrences to 5 occurrences). The second and final vocal RICD condition resulted in a steady, flat trend (M = 1.5 occurrences; range, 1 occurrence to 2 occurrences).

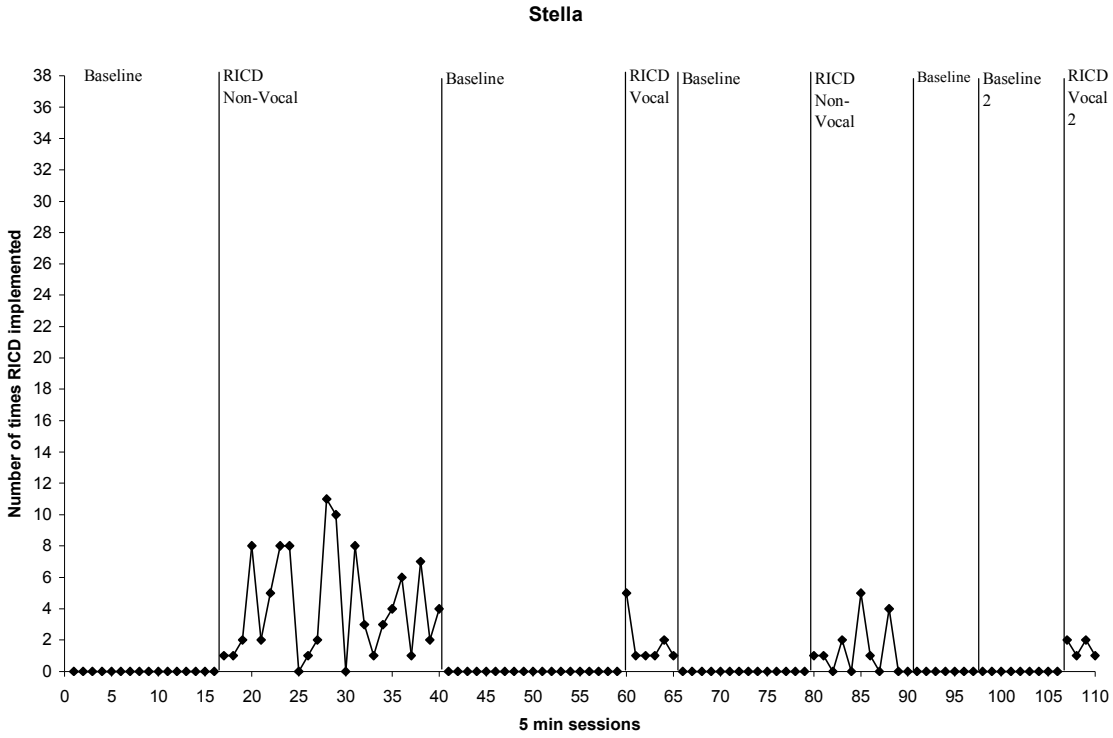

Figure 3.8. Total number of times the RICD procedure was implemented for Stella.

Chapter 4: Discussion

This study set out to address two questions: (a) will a non-vocal RICD procedure decrease the occurrence of vocal stereotypy in children with ASD compared to the decreases observed using a vocal RICD procedure, and (b) what are the teachers' opinions regarding the use of the RICD procedure to decrease vocal stereotypy. The current study found that both the non-vocal and vocal RICD procedure reduced vocal stereotypy for 2 young girls with ASD. For both participants, the vocal RICD procedure was more effective at decreasing the overall occurrence of the target behavior, total time spent in session, and number of times the RICD procedure was implemented as compared to the non-vocal RICD procedure. This study addressed the first research question and found that a contribution of this study was the identification of the non-vocal RICD procedure as an intervention to decrease vocal stereotypy. These results indicated this intervention was useful for students who do not possess the skills to reliably repeat words or phrases provided by a practitioner, but who can complete or be prompted to complete motor tasks. Reducing the reliance on vocal communication skills renders this intervention applicable to a wide range of individuals with ASD with varying vocal abilities. Thus, children with ASD who do not possess reliable vocal communication skills can be given the same opportunity as children with ASD who do have reliable

vocal communication skills to benefit from increased access to appropriate vocal input from their environment (e.g., lessons at school, conversations between or with peers, etc).

Previous studies on the reduction of stereotypic behaviors have examined different types of interventions to reduce stereotypy. Some studies have focused solely on vocal RICD procedures to decrease vocal stereotypy (Ahearn et al., 2007; Athens et al., 2008; Liu-Gitz & Banda, 2010). Other studies have examined primarily reinforcement based procedures to reduce general stereotypic behavior (Ringdahl et al., 2002; Taylor, Hoch & Weissman, 2005); these reinforcement based procedures have had little success unless paired with another intervention such as time-out or overcorrection (Harris & Wolchik, 1979). Finally, other studies have used a simple correction procedure (Richmond & Bell, 1983). The overcorrection and simple correction procedures are similar to the current RICD procedure in that both included stopping the target behavior and redirection to another behavior. The vocal RIRD procedure, overcorrection, and simple correction procedures redirect the individual to engage in an incompatible behavior as a way to decrease the target behavior. These procedures are effective only for individuals who possess the prerequisite skills to perform the incompatible behavior. The results of the non-vocal RICD procedure, on the other hand, provide evidence that vocal stereotypy can be reduced when non-incompatible behaviors are used as an intervention.

When the current intervention is divided into its subsequent parts, response interruption can be considered the antecedent portion of the intervention package while the consequence portion of the intervention is contingent demands. Due to the potential volume of engagement in vocal stereotypy, each participant may or may not have been responding to the initial interruption but instead to the demands that followed. For

example, a student is engaged in highly audible vocal stereotypy that is typically multiple lines from a movie. The antecedent portion of the intervention, the response interruption, is employed, however the student does not respond. Instead, he responds to the initial instruction, “Say pizza” which is part of the consequence portion of the intervention, contingent demands. It was the response to the demand and not the interruption that affected the behavior.

The examination of the non-vocal RICD procedure versus the vocal RICD procedure provided more information as to the behavioral principles that were operating. In the vocal RICD procedure, it is hard to conclude the use of a punishment based package (i.e., interruption and contingent demand) or the use of an incompatible behavior in combination with punishment based package was responsible for the decrease in vocal stereotypic behavior. Given that the non-vocal RICD procedure decreased the target behavior, and motor demands are not incompatible with the target behavior, the experimenter is better able to conclude that the behavioral principle responsible for the decrease in vocal stereotypy when using either the vocal or non-vocal RICD procedure was punishment. As noted earlier, Azrin and Holtz (1966) described punishment as a stimulus change that decreases the future likelihood of the target behavior. When the current intervention is broken into its subsequent parts, it can be shown how it fits into this definition provided by Azrin and Holtz. Throughout both RICD conditions, when each participant engaged in vocal stereotypy (i.e., a response), she was interrupted and the contingent demand procedure was employed (i.e., a stimulus change). This resulted in a decrease in the frequency of vocal stereotypy over time. Therefore, the current study demonstrated the use of punishment as a primary mechanism to alter vocal stereotypic

behavior. LeBlanc et al. (2007) had previously noted that a function-based intervention may not be the most appropriate when dealing with a stereotypical behavior if it is not socially mediated or the function expressly identified, and practitioners should consider punishment as one possible solution. The second recommendation by LeBlanc et al. stated that stimulus competition could also be a potential intervention for automatically maintained behaviors. Previous studies that implemented response blocking and redirection procedures have briefly mentioned that punishment may be responsible for the decreases that each of the experimenters saw as a result of this procedure (Ahearn et al., 2007; Athens et al., 2008; Liu-Gitz & Banda, 2010).

A second question addressed by the study was the teachers' opinions regarding the use of the RIRD procedure to decrease vocal stereotypy. This question was addressed by asking the teachers to fill out a social validity form. Each classroom teacher rated this intervention as one that she would be willing to implement instead of the current plan in place within the classroom. Each teacher also stated she would recommend this procedure to another teacher with a student who engaged in vocal stereotypy.

Limitations

Throughout the course of the study, several limitations of the procedures used were noted. One limitation of the procedures included noncompliance as a significant contributor to initial session length for Violet. In the first non-vocal RICD condition, Violet had an initial session time of 42 min and during the first vocal RICD condition she had a 58 min session. These session times were inflated due to the experimenter continually issuing the demand and moving through the prompting hierarchy until compliance was achieved. Participant compliance is a key requirement for the second

component of this intervention. If a participant is non-compliant when contingent demands are presented then the mechanism responsible for behavior change may be extinction rather than punishment. It is possible that the RICD procedure functioned similarly to an escape extinction intervention during these two sessions and either an extinction burst occurred or a punishment induced emotional and aggressive response to the intervention. Behaviors during these sessions included, lying on the floor against cabinets in the room, holding her arms tightly against her body to prevent prompting of motor tasks during the non-vocal condition as well as throwing the writing materials. During the vocal RICD procedure, noncompliance consisted of either shouting her responses, which can be a side effect of extinction or, as previously referenced, an emotional reaction to the punishment procedure. This noncompliance was, in general a refusal to repeat the words issued, often without accompanying vocal stereotypy. That is, Violet would rarely say anything or make any sound while she was noncompliant. For several minutes during the 58 min session, Violet engaged in aggressive behaviors including attempts to rip the flashcard being used to prompt the vocal response and hitting the experimenter. Cooper, Heron and Heward (2007) discuss the importance of planning for extinction-produced aggression that may have been a factor during this particular session. Given that aggression occurred only during one session and not throughout the study, it is not clear if the observed aggression was a side effect of punishment or a side effect of extinction. During sessions 6 and 29, it can be challenging to pinpoint the exact mechanism (i.e., punishment or extinction) responsible for the decrease in vocal stereotypy. First each participant's vocal stereotypy was automatically maintained. Thus, it is unknown what was the reinforcer maintaining the vocal stereotypy

and being able to differentiate the reinforcer for vocal stereotypy from the reinforcer for compliance to demands. It is difficult to ascertain if the noncompliant behaviors (e.g., aggression, shouting answers, etc.) during sessions 6 and 29 were a result of the following: The removal of the reinforcer, vocal stereotypy, resulting in an extinction burst or the repeated application of contingent demands resulting in the decrease of vocal stereotypy (Cooper, Heron & Heward, 2007; Iwata, Pace, Cowdery and Miltenberger, 1994).

Some factors considered by the experimenter as to the difference in compliance between Violet and Stella, who did not have noncompliance issues, included their ability to function as a member of the classroom. As reported by the teacher, Stella demonstrated mastery of desired classroom behaviors such as appropriate sitting during group or independent work time, the ability to answer questions and expand her answers following a simple prompt, and the ability to complete classroom work. Violet did not possess these skills to the same extent as Stella. It is important to note that despite challenges with noncompliance in each of the initial conditions, the noncompliant type behaviors observed in the initial sessions were either minimal or not present in sessions conducted in the middle or end of each condition. Noncompliance was a major contributing factor to the overall length of the sessions, thus as the participant was more compliant the overall length of the sessions decreased to near 5 min. It should be noted that noncompliance was not a concern of the teacher in Violet's classroom. Teachers and practitioners should be aware that noncompliant behaviors could result during the initial applications of the intervention. This study, despite episodes of noncompliance and varying levels of appropriate behavior related to classroom participation from each participant, was still

effective at decreasing vocal stereotypy. Future research should examine the effectiveness of this procedure for participants with a known history of noncompliance.

A second limitation of the procedures was an overall lack of appropriate interactions during the course of this study. A few times Stella appropriately said, "Excuse me" following bodily noises and a few times Violet labeled the letter or shape she was tracing during the non-vocal RICD procedure. These vocalizations did not lend themselves to an interaction with the experimenter and therefore appropriate interactions never contacted reinforcement that would potentially lead to an increase in this highly desired behavior. In behavior analytic literature, teaching replacement behaviors is considered as important as decreasing problem behaviors. Therefore, future research should consider the possibility of an additional aspect of the intervention involving prompting appropriate interactions in combination with the use of the RICD procedure in an attempt to decrease vocal stereotypy while subsequently increasing appropriate interactions.

A third limitation noted was the use of two separate data collection methods during the study, momentary time sampling during the FA and partial interval scoring during baseline and intervention sessions. These methods were used because this study was a partial replication of the Ahearn et al. (2007) study. These two different data collection procedures could be misleading when attempting to compare percentages of vocal stereotypy during the FA and percentages of vocal stereotypy during baseline sessions. Therefore, future research should consider using the same partial interval method for data collection across the FA and the intervention for a more direct comparison of percentage of time engaged in vocal stereotypy throughout the study.

Implications for Future Research

During the final baseline and final vocal RICD procedure with Stella a change to protocol was made due to the inability to recover previous baseline levels of vocal stereotypy. This change included allowing Stella to have access to preferred materials because following the end of a session when she was given access to her reinforcer, the target behavior re-emerged at much higher frequencies than during the session. During previous sessions, Stella tended to engage in behaviors that seemed to be a result of non-stimulation from items in her direct environment. These behaviors typically included shouting into the desk, picking her lip, glancing around the room, or rearranging and running her fingers over her clothes. One difference between sessions for Violet and Stella was Violet's session rooms were slightly larger and Violet tended to move around the room and interacted with the cabinets, light switches, table, and chairs. Though Stella was told that she could roam about the session room, she sat on a chair at the desk. Future research should consider providing some sort of additional stimuli during sessions as these 2 participants tended to engage in the target behavior more frequently when allowed to interact with materials. An environment with manipulative stimuli is also more representative of a classroom or home environment where various stimuli are present.

A final note for future research arose as a result of transferring the procedure to the teacher and classroom environment. Following the completion of the study, the experimenter presented a stimulus that represented when the procedure was going to be implemented. This stimulus was a double-sided card where the red side of the card stood for the presence of the intervention and the green side of the card represented when the

participant was free to engage in vocal stereotypy. The card was a distinctive stimuli in the participant's environment to inform her of the types of consequences that will be applied if she engages in vocal stereotypy. Though formal data were not collected, classroom data and anecdotal observations indicated that each participant quickly learned to refrain from vocal stereotypy in the presence of the red card and would re-engage in the behavior upon seeing the green card. When presented with the green card, Violet would promptly engage in vocal stereotypy, typically at a highly audible volume, and continue throughout the majority of her break from the intervention. The use of the green/red card in addition to the vocal RICD procedures was transferred to the teacher and in Violet's case to the paraprofessionals within the classroom to provide them with a method of decreasing what had previously been a disruptive behavior for the entire classroom. Based on the experience gained while transferring the intervention procedures, the experimenter would recommend that future use of this procedure include ample amounts of training and feedback to classroom staff. Additionally, the intervention needs to be conducted with high fidelity in order to maintain its effectiveness because each of the current participants was sensitive to the stimulus changes from green to red cards. Given that, punishment is considered the main behavioral principle responsible for decreasing vocal stereotypy, the true function of the behavior, automatically maintained stereotypy, was not addressed. The use of a punishment based procedure will require that either replacement skills are taught (e.g., appropriate interactions with materials and people) and/or the appropriate time to engage in vocal stereotypy (e.g., during free time or at home) should be considered. With that in mind, it is important to note the use of the green card allowed the participants' time to engage in vocal stereotypy. The use of the

RICD procedure during the entire school day may not be achievable due to the following factors: the target behavior was automatically maintained, during the intervention the target behavior was not reduced to zero occurrences, and one participant was initially noncompliant during the intervention. It is important to note that if noncompliance is not a concern, the procedure itself takes only a few seconds to implement. However, dependent on the frequency of vocal stereotypy, this procedure can be time intensive to implement given each instance of the target behavior has to be interrupted and subsequently redirected. Future research should investigate ways to increase the amount of time participants can refrain from engaging in vocal stereotypy toward near zero levels.

Summary

Engagement in stereotypic behaviors is one of the diagnostic criteria for children with ASD (American Psychiatric Association, 1994). Research has demonstrated that stereotypic behavior can impede vocal development in children with ASD as compared to typically developing peers (MacDonald et al., 2007), impact academic and adaptive functioning (Kennedy et al., 2000; Lovaas et al., 1973) as well as social skills (Kennedy et al., 2000; Koegel et al., 1974). The current study is an important extension of the current literature for methods to reduce vocal stereotypy because this type of behavior has not received as much attention as the reduction of other problem behaviors (e.g., aggression or self-injury). With the exception of appropriate interactions emerging, this study produced results similar to Ahearn et al. (2007), Athens et al. (2008) and Liu-Gitz and Banda (2010) in which vocal stereotypy was decreased as a result of the vocal RIRD condition. This study has extended these previous studies by demonstrating that a non-

vocal condition is effective in reducing vocal stereotypy for children with ASD. The transfer of procedures to the teacher was an important step towards developing an intervention that is usable by classroom teachers. The use of this intervention in the classroom can increase the number of learning opportunities and social interactions for the students with ASD by decreasing the amount of time spent engaging in vocal stereotypy and decreasing disruptions to other students in the classroom.

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Appendix A: Parent/Guardian Consent for Participation

The Ohio State University Parental Permission For Child's Participation in Research

Study Title:	The effects of a response interruption and contingent demand procedure on decreasing vocal stereotypy in young children with autism spectrum disorder.
Researchers:	Principal Investigator: Nancy A. Neef, Ph.D. Co-Investigator: Leigh Ann M. Shepherd
Sponsor:	N/A

This is a parental permission form for research participation.

It contains important information about this study and what to expect if you permit your child to participate.

Your child's participation is voluntary.

Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose:
The purpose of this research is to determine an effective method for reducing vocal stereotypy in young children with autism.

Procedures/Tasks:
A functional analysis (FA) will be conducted to determine if your child's vocal stereotypy is automatically maintained (i.e., the behavior is being maintained by internal sensory stimulation). A FA is a procedure that is used to experimentally test different consequences following the problem behavior. A preference assessment will be conducted to determine appropriate and effective reinforcers for your child. You will be asked to complete a brief survey to help determine your child's preferred items to be included in the preference assessment. Following the FA, the intervention will be implemented. The intervention will consist of two phases. The first phase will consist of your son/daughter being interrupted each time s/he engages in vocal stereotypy and asked 3 questions in a row (e.g., "What is your name?"). In the next phase vocal stereotypy will be interrupted, however your son/daughter will be asked to complete a non-verbal task (e.g., pick up puzzle pieces), 3 times in a row without engaging in vocal stereotypy. To assist in more accurate data collection, a tape recording will be made of each of your child's sessions.

Duration:

Your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

Your son/daughter will be involved in this study for a total of 12 weeks and will spend 3-4 days per week in session for a maximum of 1 hour per session.

Risks and Benefits:

Risks might include your child's study related information being exposed to non-study participants or data collector. This information is being very carefully protected and more information is provided below.

Benefits will include a reduction of engagement in vocal stereotypy. As a result of this reduction, your son/daughter may spend more time appropriately interacting with peers and teachers in the classroom setting.

Confidentiality:

Efforts will be made to keep your child's study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child's participation in this study may be disclosed if required by state law. Also, your child's records may be reviewed by the following groups (as applicable to the research):

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Incentives:

There will not be any additional incentives provided to your son/daughter.

Participant Rights:

You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact **Leigh Ann M. Shepherd** at shepherd.211@osu.edu and/or 614-582-5634.

For questions about your child's rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

If your child is injured as a result of participating in this study or for questions about a study-related injury, you may contact ***Leigh Ann M. Shepherd.***

Signing the parental permission form

I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form**.**

Printed name of subject	
Printed name of person authorized to provide permission for subject	**Signature of person authorized to provide permission for subject**
Relationship to the subject	**Date and time** **AM/PM**

<u>Investigator/Research Staff</u>

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent	**Signature of person obtaining consent**
	Date and time **AM/PM**

Appendix B: Teacher Consent for Participation

The Ohio State University Consent to Participate in Research

Study Title:	The effects of a response interruption and contingent demand procedure on decreasing vocal stereotypy in young children with autism spectrum disorder.
Researcher:	Principal Investigator: Nancy A. Neef, Ph.D. Co-Investigator: Leigh Ann M. Shepherd
Sponsor:	N/A

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate.

Your participation is voluntary.

Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose:
The purpose of this research is to determine an effective method for reducing vocal stereotypy in young children with autism.

Procedures/Tasks:

Prior to the start of intervention a preference assessment will be conducted to determine appropriate and effective reinforcers for the student's participating in the study. You will be asked to complete a brief survey to help determine each student's preferred items to be included in the preference assessment.

Following the final session, you will be asked to complete a Teacher Satisfaction Survey to help determine how helpful, or not, this approach was with your student(s).

Duration:

You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

The student(s) will be involved in this study for a total of 12 weeks and will spend 3-4 days per week in session for a maximum of 1 hour per session.

Risks and Benefits:

Risks might include your study related information being exposed to non-study participants or data collector. This information is being very carefully protected and more information is provided below.

Benefits will include a reduction of engagement in vocal stereotypy. As a result of this reduction, your student(s) may spend more time appropriately interacting with you and with peers in the classroom setting.

Confidentiality:

Efforts will be made to keep your study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Incentives:

There will not be any additional incentives provided to you.

Participant Rights:

You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact **Leigh Ann M. Shepherd** at shepherd.211@osu.edu and/or 614-582-5634.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

If you are injured as a result of participating in this study or for questions about a study-related injury, you may contact ***Leigh Ann M. Shepherd.***

Signing the consent form

I have read (or someone has read to me) this form and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form**.**

Printed name of subject		**Signature of subject**	
			AM/PM
		Date and time	
Printed name of person authorized to consent for subject (when applicable)		**Signature of person authorized to consent for subject (when applicable)**	
			AM/PM
Relationship to the subject		**Date and time**	

<u>Investigator/Research Staff</u>

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent		**Signature of person obtaining consent**	
			AM/PM
		Date and time	

Appendix C: Momentary Time Sampling Data Sheet

Momentary Time Sampling – Functional Analysis

Date: _____ Student:_____ Observer: _____ Session #: ____ IOA Collected:_____

Rely:_____ Time of intervention: _____ Condition: _____

	Seconds	Vocal Stereotypy
Minute 1	0-10	
	11-12	
	13-22	
	23-24	
	25-34	
	35-36	
	37-46	
	47-48	
	49-58	
	59-60	
Minute 2	0-10	
	11-12	
	13-22	
	23-24	
	25-34	
	35-36	
	37-46	
	47-48	
	49-58	
	59-60	
Minute 3	0-10	
	11-12	
	13-22	
	23-24	
	25-34	
	35-36	
	37-46	
	47-48	
	49-58	
	59-60	
Minute 4	0-10	
	11-12	
	13-22	
	23-24	
	25-34	
	35-36	
	37-46	
	47-48	
	49-58	
	59-60	
Minute 5	0-10	
	11-12	
	13-22	
	23-24	
	25-34	
	35-36	
	37-46	
	47-48	
	49-58	
	59-60	
% of Int.		
Rate		

Appendix D: Procedural Integrity Data Sheet, Baseline

Procedural Integrity - Baseline

Date: _____ Student:_____
Session #: _____ IOA day: _____
Time of intervention: _____ Condition: _____

	1	2	3	4	5	6	7	8	9	10	11	12
Student engages in VS												
Experimenter kept a distance of at least 3 feet from the participant												
Experimenter did not provide any feedback for VS												
Experimenter did not provide any feedback for other problem behavior												
Experimenter did not provide any feedback for appropriate responses												

N/A denotes the opportunity for engagement in either VS, problem behavior or appropriate
behavior did not apply
\+ denotes procedure followed correctly
\- denotes procedure not followed correctly

Problem behavior consists of laying on the floor, or engaging in physical contact with the experimenter.
Feedback consists of verbal responses or physical guidance when the participant engages in appropriate or problem behavior.

Appendix E: Procedural Integrity Data Sheet, Intervention

Procedural Integrity - Intervention

Date: _____ Student:_____
Session #: _____ IOA day: _____
Time of intervention: _____ Condition: _____

	1	2	3	4	5	6	7	8	9	10	11	12
Student engages in VS												
Session timer stops												
Therapist presents demand 1												
Therapist presents demand 2												
Therapist presents demand 3												
Therapist continued to present demands until participant responded 3 consecutive times.												
Session time starts												

Therapist responds to any appropriate vocalizations	

N/A denotes the opportunity for engagement in either VS, problem behavior or appropriate
behavior did not apply
\+ denotes procedure followed correctly
\- denotes procedure not followed correctly

Problem behavior consists of laying on the floor, or engaging in physical contact with the experimenter.
Feedback consists of verbal responses or physical guidance when the participant engages in appropriate or problem behavior.

Appendix F: Reinforcer Assessment Interview Form, Parent/Guardian

Reinforcer Assessment Interview Form

Date: _____
Participant's Name: _____
Name of person completing form: _____

Dear parent/guardian:

The purpose of this structured interview is to get as much specific information as possible from you, the parent (or caregiver), as to what you believe would be useful reinforcers for your child. There are 10 total categories, and though I would like to have a list of 10 possible reinforcers, they do not all need to be from the same category. Therefore, this survey will ask questions about categories of reinforcers (e.g., visual, auditory, etc.).

1. Some individuals really enjoy looking at things such as a mirror, bright lights, shiny objects, spinning objects, TV, etc. What are the things you think your son/daughter most likes to watch?

_____

_____

_____

2. Some individuals really enjoy different sounds such as listening to music, car sounds, whistles, beeps, sirens, clapping, people singing, etc. What are the things you think your son/daughter most likes to listen to?

_____

_____

_____

_____

3. Some individuals really enjoy different smells such as perfume, flowers, coffee, pine trees, etc. What are things you think your son/daughter most likes to smell?

_____

_____

_____

_____

4. Some individuals really enjoy certain foods or snacks such as ice cream, pizza, juice, soda, coffee, candy, graham crackers, McDonald's hamburgers, etc. What are the things you think your son/daughter most likes to eat?

5. Some individuals really enjoy physical play or movement such as being tickled, wrestling, running, dancing, swinging, being pulled on a scooter board, etc. What activities like this do you think your son/daughter most enjoys?

6. Some individuals really enjoy touching things of different temperature, cold things like snow or an ice pack, or warm things like a hand warmer or a cup containing hot tea or coffee. What activities like this do you think your son/daughter most enjoys?

7. Some individuals really enjoy feeling different sensations such as splashing water in a sink, a vibrator against the skin, or the feel of air blown on the face from a fan. What activities like this do you think your son/daughter most enjoys?

8. Some individuals really enjoy it when others give them attention such as a hug, a pat on the back, clapping, saying "Good job", etc. What forms of attention do you think your son/daughter most enjoys?

9. Some individuals really enjoy certain toys or objects such as puzzles, toy cars, balloons, comic books, flashlight, bubbles, play make-up, etc. What are your son/daughter's favorite toys or objects?

10. What are some other items or activities that your son/daughter really enjoys?

Appendix G: Reinforcer Assessment Interview Form, Teacher

Reinforcer Assessment Interview Form

Date: _____
Participant's Name: _____
Name of person completing form: _____

Dear teacher:

The purpose of this structured interview is to get as much specific information as possible from you, the teacher, as to what you believe would be useful reinforcers for your student. There are 10 total categories, and though I would like to have a list of 10 possible reinforcers, they do not all need to be from the same category. Therefore, this survey will ask questions about categories of reinforcers (e.g., visual, auditory, etc.).

1. Some individuals really enjoy looking at things such as a mirror, bright lights, shiny objects, spinning objects, TV, etc. What are the things you think _____ most likes to watch?

_____

_____

_____

2. Some individuals really enjoy different sounds such as listening to music, car sounds, whistles, beeps, sirens, clapping, people singing, etc. What are the things you think _____ most likes to listen to?

_____

_____

_____

_____

3. Some individuals really enjoy different smells such as perfume, flowers, coffee, pine trees, etc. What are things you think _____ most likes to smell?

_____

_____

_____

_____

4. Some individuals really enjoy certain foods or snacks such as ice cream, pizza, juice, soda, coffee, candy, graham crackers, McDonald's hamburgers, etc. What are the things you think _____ most likes to eat?

5. Some individuals really enjoy physical play or movement such as being tickled, wrestling, running, dancing, swinging, being pulled on a scooter board, etc. What activities like this do you think _____ most enjoys?

6. Some individuals really enjoy touching things of different temperature, cold things like snow or an ice pack, or warm things like a hand warmer or a cup containing hot tea or coffee. What activities like this do you think _____ most enjoys?

7. Some individuals really enjoy feeling different sensations such as splashing water in a sink, a vibrator against the skin, or the feel of air blown on the face from a fan. What activities like this do you think _____ most enjoys?

8. Some individuals really enjoy it when others give them attention such as a hug, a pat on the back, clapping, saying "Good job", etc. What forms of attention do you think _____ most enjoys?

9. Some individuals really enjoy certain toys or objects such as puzzles, toy cars, balloons, comic books, flashlight, bubbles, play make-up, etc. What are _____'s favorite toys or objects?

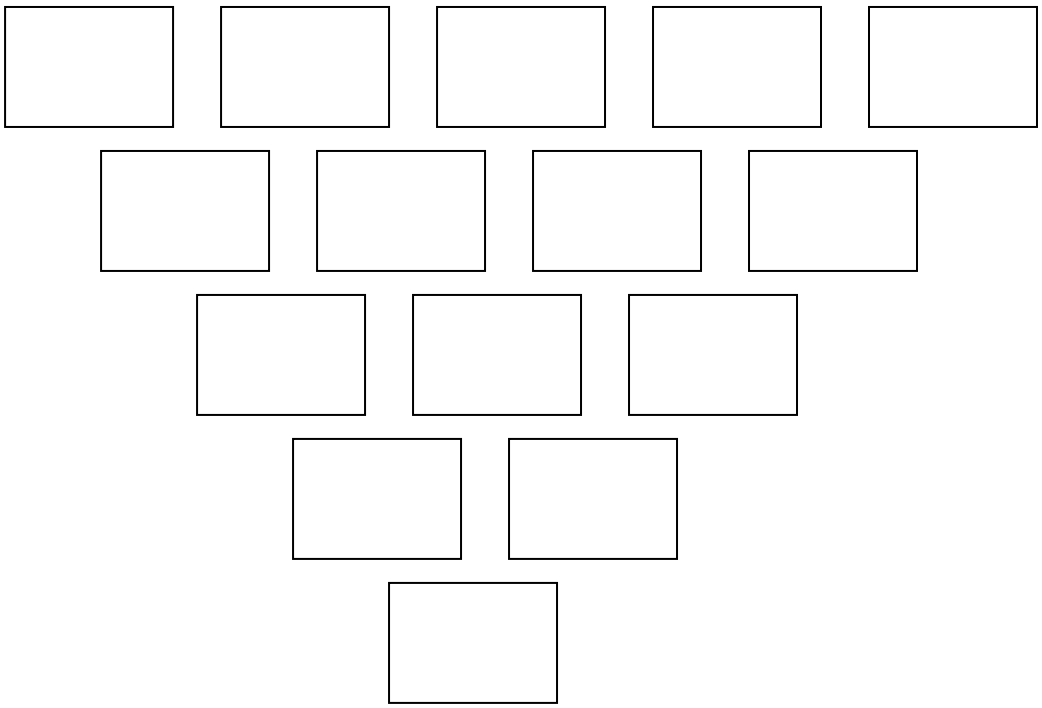
10. What are some other items or activities that _____ really enjoys?

Appendix H: Multiple Stimulus Without Replacement Data Sheet

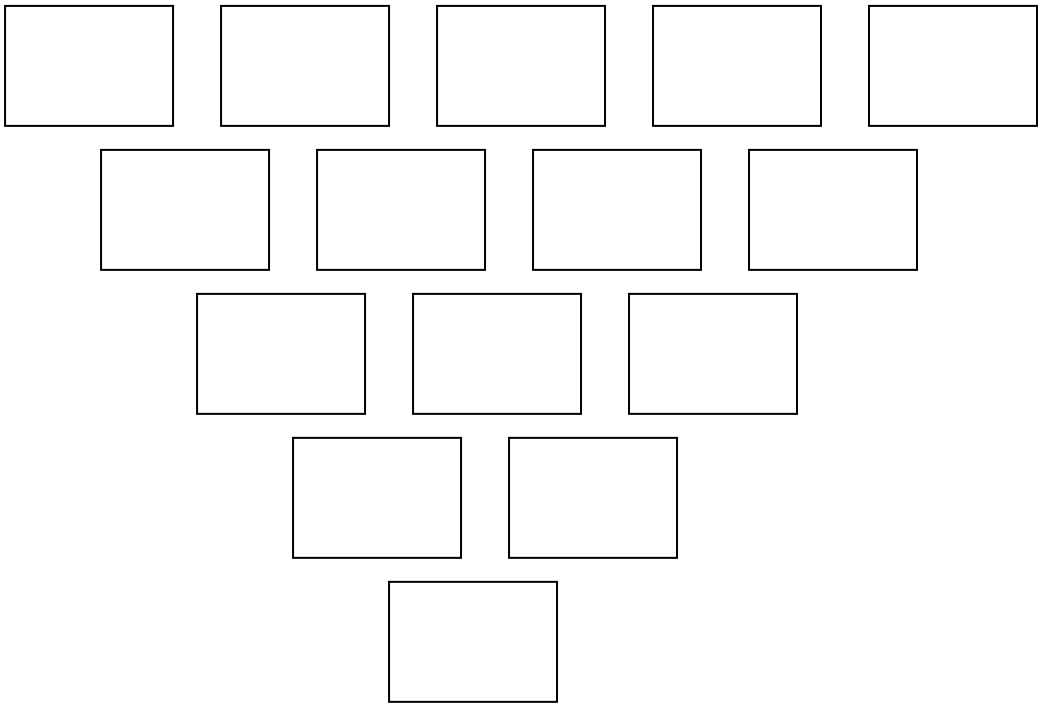
Multiple Stimulus Without Replacement Data Sheet

Student: _____ Time: _____ Date: _____

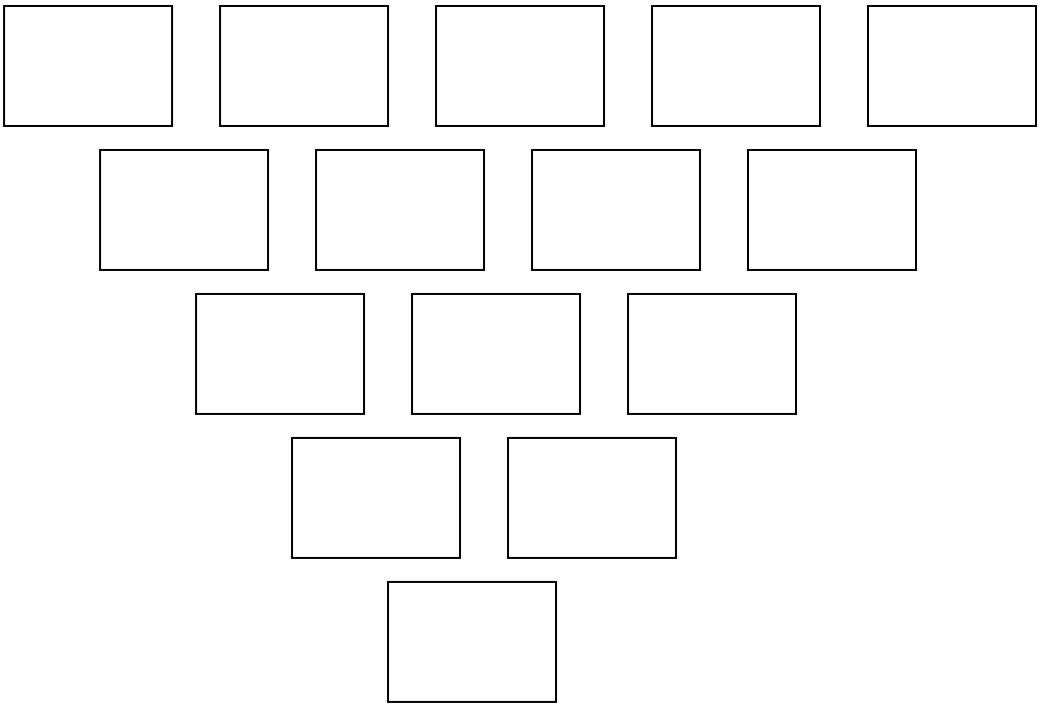
Session #



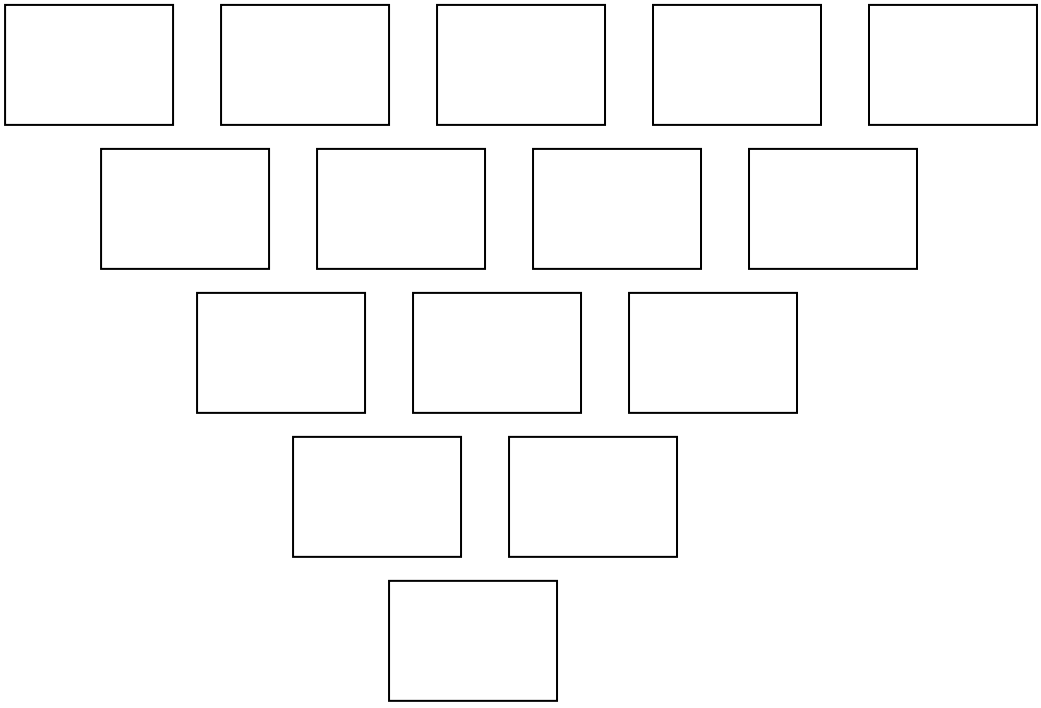
Session #



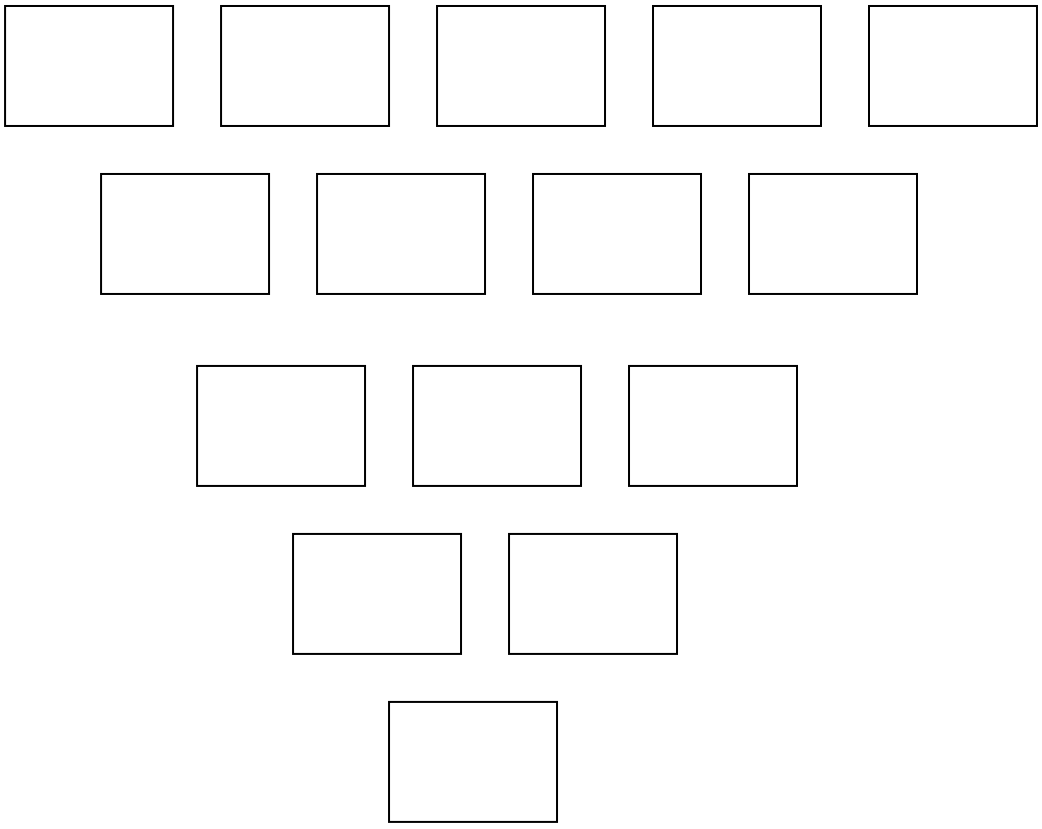
Session #



Session #



Session #



Items

1.

2.

3.

4.

5.

Data Summary

1. Record item selection each trial.
2. Item selection is defined as physical contact with one of the presented items.
3. Calculate the number of times an item was selected by the number of trials during which the item was presented (percentage of trials selected).

Item 1 _____
Number of trials selected / number of trials presented X 100 =
_____ / _____ X 100 = _____% of trials selected

Item 2 _____
Number of trials selected / number of trials presented X 100 =
_____ / _____ X 100 = _____% of trials selected

Item 3 _____
Number of trials selected / number of trials presented X 100 =
_____ / _____ X 100 = _____% of trials selected

Item 4 _____
Number of trials selected / number of trials presented X 100 =
_____ / _____ X 100 = _____% of trials selected

Item 5 _____
Number of trials selected / number of trials presented X 100 =
_____ / _____ X 100 = _____% of trials selected

Appendix I: Free Operant Preference Assessment Data Sheet

Free Operant Preference Assessment

Date: _____ Student:_____
Observer: _____
Session #: _____ IOA Collected:_____ Rely:_____
Time of intervention: _____ Condition: _____

Minute 1	Seconds					
	60-51					
	50-41					
	40-31					
	30-21					
	20-11					
	10-0					
Minute 2	60-51					
	50-41					
	40-31					
	30-21					
	20-11					
	10-0					
Minute 3	60-51					
	50-41					
	40-31					
	30-21					
	20-11					
	10-0					
Minute 4	60-51					
	50-41					
	40-31					
	30-21					
	20-11					
	10-0					
Minute 5	60-51					
	50-41					
	40-31					
	30-21					
	20-11					
	10-0					
% of Intervals						
Rate						

Appendix J: Partial Interval Recording Data Sheet, Baseline

Partial Interval Recording - Baseline

Date: _____ Student:_____
Observer: _____
Session #: _____ IOA Collected:_____ Rely:_____ Time of intervention: _____ Condition: _____

Minute 1	Seconds	Vocal Stereotypy	Appropriate Interactions
	60-51		
	50-41		
	40-31		
	30-21		
	20-11		
	10-0		
Minute 2	60-51		
	50-41		
	40-31		
	30-21		
	20-11		
	10-0		
Minute 3	60-51		
	50-41		
	40-31		
	30-21		
	20-11		
	10-0		
Minute 4	60-51		
	50-41		
	40-31		
	30-21		
	20-11		
	10-0		
Minute 5	60-51		
	50-41		
	40-31		
	30-21		
	20-11		
	10-0		
% of Intervals			
Rate			

Appendix K: Partial Interval Recording Data Sheet, Intervention

Partial Interval Recording - Intervention

Date: _____ Student:_____
Observer: _____
Session #: _____ IOA Collected:_____ Rely:_____
Time of intervention: _____ Condition: _____

Minute 1	Seconds	RICD	Vocal Stereotypy	Appropriate Interactions
	60-51			
	50-41			
	40-31			
	30-21			
	20-11			
	10-0			
Minute 2	60-51			
	50-41			
	40-31			
	30-21			
	20-11			
	10-0			
Minute 3	60-51			
	50-41			
	40-31			
	30-21			
	20-11			
	10-0			
Minute 4	60-51			
	50-41			
	40-31			
	30-21			
	20-11			
	10-0			
Minute 5	60-51			
	50-41			
	40-31			
	30-21			
	20-11			
	10-0			
% of Intervals				
Rate				

Appendix L: Teacher Satisfaction Survey

Teacher Satisfaction Survey

Dear Special Education Teacher,

Thank you for allowing research to be conducted in your classroom over the past few months. I would like to take this opportunity to determine how advantageous this research was, in your opinion, with respect to previous interventions used or level of engagement in vocal stereotypy for the participants. Please check the box that most accurately describes your experience.

1. To what extent did you feel your classroom routines (e.g., calendar, centers, small group) were affected during the intervention?

1	2	3	4	5
Constant disruptions	Many disruptions.	Neutral	Some disruptions	No disruptions

2. To what extent would you be willing to change the way you interact with the student in order to implement these procedures?

1	2	3	4	5
Definitely would not	Probably would not	Neutral	Would consider	Definitely would

3. To what extent did you observe a decrease in the participant's engagement in vocal stereotypy upon completion of the study?

1	2	3	4	5
Behavior definitely increased	Behavior slightly increased	Neutral	Behavior slightly decreased	Behavior definitely decreased

4. To what extent would you recommend this intervention to other special education teachers who have students that engage in vocal stereotypy?

1	2	3	4	5
Definitely would not	Probably would not	Neutral	Would consider	Definitely would