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The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Adolescents with Disabilities

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The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Adolescents with Disabilities

by

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We the undersigned committee hereby approve the attached thesis, "The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Adolescents with Disabilities" by Rachel Ruthann Thomas.

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Abstract

Title: The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Adolescents with Disabilities

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The purpose of the current study was to compare the effects of reinforcement magnitude plus praise on correct, unprompted responding during Discrete Trial Training (DTT) among adolescents with an intellectual disability. Participants were teenaged individuals with an intellectual disability who are able to engage in vocal-verbal responding and can read independently. An alternating treatments design with generalization probes to novel environments and people (using confederates within the research lab) was used to evaluate intervention effects. During baseline, participants were asked each intraverbal question but were not given any prompting or feedback. During treatment, edible items were delivered contingent upon correct, unprompted responses to mands for personal information. In the high-magnitude condition, a double portion of a large-sized preferred edible was delivered. In the low-magnitude condition, a single portion of a miniature-sized preferred edible item was delivered. A praise only condition was also utilized to compare the efficacy of social praise against edible reinforcers plus

praise. Results showed that two out of three participants acquired the targets most quickly in the high-magnitude condition.

Keywords: reinforcement magnitude, skill acquisition, intraverbals

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Dedication

I would like to dedicate my thesis to my family and friends. You have all stood by the craziness that has been my schedule for years. Your love and patience is greatly appreciated.

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The Effects of Reinforcement Magnitude on Unprompted Responses to Mands for Personal Information in Adolescents with Disabilities

Behavior analysis is a natural science which focuses on the manipulation of environmental events to change an organism's behavior. There are three major sub-divisions of behavior analysis: Experimental Analysis of Behavior (EAB), Applied Behavior Analysis (ABA), and the conceptual analysis of behavior. EAB studies the basic principles of behavior, while ABA uses the basic principles of behavior derived from EAB to improve behaviors of social significance (e.g., self-injurious behavior, aggressive behavior). The conceptual analysis of behavior is the study of the philosophical, historical, and theoretical issues that surround behavior analysis (Cooper, Heron, & Heward, 1987).

Within ABA, two broad classes of interventions exist: interventions to decrease behavior and interventions to increase behavior. The first aims to decrease behaviors that impede learning or daily living, such as stereotypy (repetitive motor movements), or that are potentially dangerous or harmful, such as self-injurious behaviors. Skill acquisition, or increasing behaviors, is the second intervention type. Practitioners use assessments (e.g., Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP; Sundberg, 2008) to identify deficits, or "holes," in the learner's repertoire and teach the missing skills. Teaching the

deficient skills can help the learner to master other behaviors which they may need later in life.

Two broad behavior analytic teaching strategies exist to instruct learners with intellectual disabilities. The first of these is incidental teaching or natural environment training (NET) and the second is discrete trial training (DTT). Incidental teaching is a method of teaching in which the learner is "in control." The teacher follows the learner and uses the stimuli available in the area for teaching opportunities. Incidental teaching is also called natural environment training due to its use of the stimuli surrounding the individual (Hart & Risley, 1975).

DTT is highly structured by the instructor. It is a method of teaching which involves an instruction, the learner's response, and the instructor-delivered response (Myles, Swanson, Holverstott, & Duncan, 2007). DTT can be used to teach many different skills (e.g., pre-academic/academic skills, language skills) and is generally taught in a specific work area that is free from as much distraction as possible at a table or a desk with the teacher situated across from the student (Myles et al., 2007). Each target trial has a distinct beginning and end. As new skills are introduced, the instructor presents the target skill, often using errorless teaching (Heflin & Alberto, 2001; Touchette & Howard, 1984). Errorless teaching gives the learner little opportunity to make a mistake while engaging in the target skill. Errorless teaching uses prompting that gets faded as a learner continues. Errors in responding undergo an error correction procedure that also involves

prompting. Errorless teaching employs a method of reinforcement delivery known as differential reinforcement (DR; Leaf & McEachin, 1999; Lovaas, 2003). In differential reinforcement, desired responses within the response class are reinforced while undesired responses are not reinforced (Cooper, Heron, & Heward, 1987). In 2009, Karsten and Carr studied the efficacy of differential reinforcement in comparison to nondifferential reinforcement. They found that, although both methods of reinforcement were effective for teaching, differential reinforcement was more reliable (Karsten & Carr, 2009).

Early learners with little to no language skills generally begin DTT learning basic skills. The learner will follow directions placed by the instructor, such as: "Jump," "Clap hands," "Sit down," etc. and copy the instructor's exact fine and gross motor movements. Later, the learner may focus on language skills. Originally coined by B.F. Skinner, Verbal Behavior involves operant behaviors surrounding communication and language. There are several types of what are termed "verbal operants," but the most commonly taught are: echoics, mands, tacts, and intraverbals. The echoic is defined as a verbal stimulus with which the learner mimics exactly (or with point-to-point correspondence). Learners who can echo sounds and words are then able to proceed into more complex Verbal Behavior instruction. The mand is a verbal operant which is controlled by motivation to obtain or end a stimulus. Manding is commonly compared to requesting. Mands are important because the learner has motivation for an item or event, and this can

potentially be used to increase or maintain other behaviors. The tact is evoked by a non-verbal stimulus in the environment. Tacting is also known as labelling because the learner will emit the tact in the presence of some stimulus (e.g., learner sees a cat and says, “cat”). Finally, the intraverbal is a verbal stimulus which is met with the response of a corresponding verbal stimulus with which point-to-point correspondence is not required. Intraverbals can range from questions/answers to fill in the blanks to making lists based on categories. Intraverbals and tacts often get combined when an instructor teaches a tact by giving a verbal stimulus, such as, “What is this?” The learner delivers a verbal response, which is an intraverbal, but is simultaneously labelling, which is a tact (Michael, 1984; Skinner, 1957; Sundberg & Michael, 2001).

Intraverbal responding is a behavioral cusp for learners. That is, once a learner is able to engage in intraverbal responding, this creates new opportunities to learn other, more complex behaviors. Typically-developing adults and children engage in intraverbal responding with little to no complications through daily conversation. Questions are asked, answers are delivered, and information is acquired. From a very young age, people answer questions on a wide range of topics, including questions surrounding personal information (i.e., name, address, where one works, etc.). These questions can be defined as mands for personal information wherein one party seeks information from another and the reinforcement is delivered in the form of the answer, or intraverbal response, to that

question. Learners with disabilities or language deficits often are unable to respond to these intraverbal mands for personal information. This leads to a lower quality of life for the individual, and it may increase their risk of future harm (Lorah, Karnes, & Speight, 2015).

Reinforcement, by definition, is any stimulus that, when delivered contingent upon a response, maintains or increases the future probability that the same response will occur under those same conditions (Cooper et al., 1987). One question that behavior analysts have asked is how much of a reinforcing stimulus needs to be delivered to maintain and/or increase a response. The amount of reinforcement delivered is known as reinforcement magnitude. Reinforcement magnitude can refer to portions delivered, number of objects delivered, or differing amounts of time with the reinforcing stimulus (e.g., break from work or time spent with a toy). Before using reinforcement, it is important to know the effects of varying reinforcement magnitude.

Webber, Chambers, Kostek, Mankin, & Cromwell (2015) studied choice responding in rats when comparing two reinforcement outcomes. They measured any possible contrast effects for the different reinforcement magnitudes within three different conditions: large reward outcome comparisons, medium-sized reward outcome comparisons, and small reward outcome comparisons. This study used rats and the delivery of food pellets. Reinforcement magnitude, in the form of differing amounts of food pellets, had an effect on latency. Latency is the amount

of time between the stimulus and a response (Cooper et al., 1987). The latency to nosepoke after a single tone was significantly shorter during the large reward, or high-magnitude condition, in comparison to single trial blocks and when paired with medium-sized rewards. However, mixed sessions, in which a second tone and a leverpress occurred after the nosepoke, showed less of a significant difference in latency to respond. Magnitude significantly affected latency in single outcome trials; but as the trials were mixed, magnitude had less of an effect (Webber, Chambers, Kostek, Mankin, & Cromwell, 2015).

Because of the research showing an increase in problem behavior when shifting from high density reinforcement schedules to lower density reinforcement schedules, there has also been research on reinforcement magnitude in choice responding. In choice responding, the participant is given options as to what they will engage in rather than being told by someone else what they must do. Hoch, McComas, Johnson, Farada, & Guenther (2002) manipulated both reinforcement magnitude and quality during choice responding during play activities. The play choices were to play in an area with a peer or sibling or to play in an area alone. In the first condition, the magnitude (duration of access) and quality of the access to toys was equal in both areas. In the other condition, the magnitude and quality of access to toys was greater in the area where there was a peer or sibling playing. The results showed that manipulating magnitude and quality of reinforcement was an effective means of reinforcing choosing playing with peers and siblings. Most

participants did not choose to play with their peer or sibling unless the quality and magnitude of access to the toys was higher in that area (Hoch, McComas, Johnson, Faranda, & Guenther, 2002).

The studies on reinforcement magnitude with choice show how reinforcement magnitude can be manipulated to increase skill acquisition. Hoch et al. (2002) found that higher magnitude reinforcement altered the choice for children to play with their peers. Increasing the amount of time a child with disabilities engages with peers leads to more teaching opportunities in the moment. Language development and conversation skills become more important as the value of interacting with peers increases (Hoch et al., 2002).

Lerman, Kelley, Vorndran, Kuhn, & LaRue (2002) used reinforcement magnitude in a two-part experiment to show the effects of magnitude on resistance to extinction and the effects of magnitude on post-reinforcement pause (PRP). PRP occurs after contact with the reinforcing item. Organisms tend to have lower rates of responding following consumption of a reinforcer; as the next reinforcement interval approaches, rates of responding will increase (Cooper et al., 1987). Initial findings in experiment 1 showed that magnitude variations had little effect upon resistance to extinction, though the authors noted in the limitations that overlapping effects between the high-magnitude time (300s) and the low-magnitude time (20s) may have occurred. Magnitude did have an effect on PRP. In experiment 2, all participants had longer rates of pause after 300s of contact with their preferred

reinforcer compared to the 20s condition (for two participants, the reinforcer was a tangible item; for one, it was escape from a task). Knowing that magnitude could cause a longer PRP is important because during DTT sessions, rate of stimulus presentation needs to be fast. If a learner is taking longer pauses between reinforcement delivery and the next stimulus presentations, this will have an effect on their acquisition rate and could lead to more errors and prompting (Lerman, Kelley, Vorndran, Kuhn, & LaRue, 2002).

Trosclair-Lasserre, Lerman, Call, Addison, and Kodak (2008) studied reinforcement magnitude in relation to treatment of problem behavior. For this study, participants engaged in maladaptive behaviors to obtain social positive reinforcement through access to either attention or tangible items. The aim of the study was to link the efficacy of reinforcement magnitude for treatment of problem behaviors through participants' choice of magnitude. Little research had been done to link basic research on magnitude to clinically-relevant uses or participant's choice of differing levels of reinforcement magnitude. Participants were four children diagnosed with ASD and other underlying disabilities. Prior to beginning, participants were taught to engage in an arbitrary, or non-clinically relevant, replacement behavior to obtain their reinforcer. The behaviors were button pushing or chip insertion. During training, participants were given 20-s access to their reinforcer contingent on correct responding. Training trials were terminated after the participant could engage in ten consecutive trials of the behavior. Following

training, the high-magnitude condition was 120-s access to the reinforcer and the low-magnitude condition was 10-s access. The low-magnitude value was increased to 60-s access for some of the trials. These values were chosen due to their range and common use in applied research. The results of this study showed that most participants allocated their time to the high-magnitude condition. One participant showed little response differentiation between high and low-magnitude conditions even when the high-magnitude value was increased to 180-s access. Three out of four participants engaged in the newly-trained behaviors maintained by social positive reinforcement during the high-magnitude condition. Additionally, their responding persisted in the high-magnitude condition relative to the low-magnitude condition (Trosclair-Lasserre, Lerman, Call, Addison, & Kodak, 2008).

One study looked at prompt dependence and used differential reinforcement (DR) with a manipulation of the reinforcer magnitude based on preference. The goal was to see which type of reinforcement (differential or nondifferential) or extinction would have a greater effect on independent (unprompted) responding. The experiment included three conditions: 1) a nondifferential reinforcement condition in which all responses were reinforced with the highest preferred item, 2) differential reinforcement in which an independent response received the highest preferred reinforcer and a moderately preferred item for prompted responses (DR High/moderate), and 3) extinction in which there was no delivery of a reinforcer for prompted responding but the highest preferred item for independent responding

(DR High/extinction). Participants were four individuals who had been diagnosed with autism spectrum disorder between the ages of twelve and thirty-eight years. Nondifferential reinforcement was ineffective for all participants. For three out of four participants, the DR High/moderate condition showed the greatest increase in independent responding. The remaining participant showed the greatest improvement in the DR High/extinction condition. Because most of the participants showed the greatest improvement in independent responding in the DR High/moderate condition, this suggests that the magnitude of differential reinforcement can decrease prompt dependency, but it is important to remember that this can also be learner-dependent (Cividini-Motta & Ahearn, 2013).

Fiske, Cohen, Bamond, LaRue, & Sloman (2014) performed a similar experiment to Cividini-Motta & Ahearn (2013) in that they studied the effects of reinforcement magnitude on differential reinforcement. This experiment featured a choice component wherein the participants were presented with the high-magnitude and low-magnitude conditions. All participants selected the large reinforcer on more than 90% of presentations. During the reinforcer assessment, all of the participants had a significantly greater number of responses in the high-magnitude condition relative to the low-magnitude condition. The reinforcing value of the higher amount was more valuable and increased responding at higher rates than the lower amount. However, during the treatment comparison conditions, only one participant had clear differentiation in responding during the high-magnitude

condition. One participant responded equally across all conditions, and the third participant had difficulty acquiring any of the skills across all conditions. Even though magnitude had an effect on the participants' choice and responding in the reinforcer assessment, magnitude had very little noticeable effect on responding across treatment conditions for two of the three participants (Fiske et al., 2014).

Boudreau, Vladescu, Kodak, Argott, & Kisamore (2015) used four different conditions between which they alternated reinforcement quality, reinforcement magnitude, nondifferential reinforcement, and a control condition in which no reinforcement was delivered regardless of responding. The data were variable; but for two out of three participants, reinforcement magnitude had the smallest effect on skill acquisition. However, Boudreau et al. (2015) had many limitations, which may be attributed to the lack of differentiation in the data. The first of these limitations is the arrangement of the nondifferential reinforcement during the training sessions in all conditions. Nondifferential reinforcement is the delivery of the same reinforcement regardless of response, which in this case was a correct prompted or unprompted response. Differential reinforcement was used in the subsequent sessions of the quality and magnitude conditions. However, this may have caused a confounding effect with nondifferential reinforcement being present in all conditions. The second limitation is possible carryover effects from condition to condition. Because of carryover effects and confounds due to technological defects, the initial findings implied that it may be best to choose a reinforcement

strategy on a learner-to-learner basis (Boudreau, Vladescu, Kodak, Argott, & Kisamore, 2015).

Johnson, Vladescu, Kodak, & Sidener (2017) assessed the current forms of differential reinforcement (quality, magnitude, and schedules) with nondifferential reinforcement to find the most effective form of reinforcement per participant. They studied the effects of the different reinforcement types with auditory-visual matching, and then they included a validation phase, which evaluated whether this would predict the most effective arrangement across multiple skills. The results were validated for the auditory-visual matching, but only validated across multiple skills (i.e., tact and intraverbal) for a single participant (Johnson, Vladescu, Kodak, & Sidener, 2017).

Paden & Kodak (2015) compared reinforcement magnitude using large and small tangible items with a praise-only condition with children between the ages of four and five to assess efficacy of reinforcement magnitude in increasing rate of skill acquisition. Trials consisted of ten opportunities with five targets presented in random order. Sessions were run up to three times per day, up to five times per week. Participants engaged in behaviors ranging from tacting, or labelling, environmental stimuli to listener responding exercises (e.g. “Touch the car”). In this study, they used a combination adapted alternating treatments design with a multiple baseline design across participants. The experimenters rotated between three different conditions: high-magnitude, low-magnitude, and praise only. The

high-magnitude delivery was two or three edible items plus social praise. The low-magnitude delivery was 1/8th the size of the high-magnitude amount plus social praise. Praise only was brief social positive reinforcement in the form of verbal praise. The high-magnitude condition led to faster rates of skill acquisition for two out of the four participants. Paden & Kodak (2015) also included a choice component to their study. All participants in this study showed a preference for the larger-magnitude reinforcer; however, their preference did not accurately predict the magnitude in which the fastest skill acquisition occurred (Paden & Kodak, 2015). These results differed from Trosclair-Lasserre et al. (2008), in which the choice of the high-magnitude condition predicted the efficacy of the reinforcer to maintain and increase behaviors maintained by social positive reinforcement (Trosclair-Lasserre et al., 2008). These differing results lead to the notion that the effect of reinforcement on behaviors for skill acquisition differ greatly from applications to decrease behavior.

The purpose of the current study is to extend upon the current literature and replicate Paden and Kodak (2015), using a different target response and a different population to evaluate the efficacy of reinforcement magnitude in skill acquisition. The participants in the original study engaged in a range of responses from labeling environmental stimuli to following two-step instructions to answering questions in a conversational style about the environmental stimuli present. The current study focused solely on intraverbal responding to questions regarding their personal

information with participants between the ages of 8-15. The high-magnitude reinforcer was a double serving of a large edible item. The low-magnitude reinforcer was a single portion of a very small version of the same food (e.g., four Giant M&Ms™ versus one Mini M&M™). The former study determined that all participants engaged in responding for $1/8^{th}$ of the size of the large edible. To eliminate measurement errors, the current study used only edibles found in large and miniature sizes. The aim of the current study was to evaluate the extent to which higher magnitudes of reinforcement could decrease trials to criterion relative to lower magnitudes of reinforcement or praise only.

Paden and Kodak (2015) listed as a limitation that they could not control for food consumption prior to running. The current study addressed this limitation because edible reinforcement was not used in the school at which the participants attend, and all students adhere to a stringent schedule. All sessions were timed to occur before snack and lunch times to ensure that sufficient time had passed between arriving at the school and the next mealtime. A second limitation of Paden and Kodak was the learner's past history of reinforcement. For participants in the former study, praise served as a reinforcer for skill acquisition. Because phrases like, "good job!" or "nice work!" may have had a history of reinforcement in the learning environment, the current study utilized praise in the form of neutral vocal feedback. Neutral vocal feedback was a neutral repetition of the participant's correct response (e.g., "Yes, your name is Wilf," after the participant correctly

answers the question, “What your first name is?” “My name is Wilf”). As a basis of comparison across all conditions, the current study included a control condition, in which no programmed consequences were delivered regardless of responding. The control condition showed the efficacy of reinforcement across conditions, as responding should not increase in the absence of programmed consequences. Finally, because results of Paden and Kodak (2015) showed no correlation between magnitude choice and skill acquisition, the current study used generalization probes rather than choice probes to test participants’ ability to answer personal information questions when asked in a novel setting (e.g., the public library) by a novel person (e.g., a librarian). The current study used confederates posing as public service staff. These generalization probes served to increase the social validity of the study to replicate situations that could occur in the participants’ everyday life.

It is important to note that the population of the current study was different because the existing literature, regardless of target responding, focuses on children seven years old and younger. In the current study, the effects of differential reinforcement were examined with people who are in a specialized private school that have the potential to graduate and move on to independent living situations, group homes, supervised employment, or to matriculate into a public school setting. Intraverbals for mands for personal information were chosen as the target response because it is paramount that an individual have the ability to speak for

themselves and answer important questions, such as: “Where do you live?” “What is your first/last/full name?” and “What is your diagnosis?”

Method

Participants

Three individuals between the ages of 9-15 participated. Each had an intellectual disability diagnosis (i.e., autism or Down syndrome) and were receiving some form of applied behavior analytic (ABA) services. All participants could read or respond in the absence of echolalia, imitate vocalizations, had previous exposure to 0-s prompt delay (Heflin & Alberto, 2001) and errorless teaching (Touchette & Howard, 1984) for learning intraverbals, and could engage in responding using edible and/or social praise as reinforcement.

Setting and Materials

Sessions were conducted in a school/clinic classroom, and all sessions were recorded with a tablet that was visible to the participants (for treatment integrity and IOA purposes, only). During all sessions, questions were written on differently colored index cards (the different colors represented the reinforcement conditions) with the answer written on the reverse. The answers were not visible to participants except during the prompting procedure. The index cards sat on the

table in front of the researcher. The participants were not able to view which question was next but could see the order of the conditions.

Dependent Variable

The experimenter scored incorrect and correct responses on a data sheet. When the participant delivered the desired response (the answer on the back of the card) before the prompt was delivered (within a five-second delay), the response was scored as correct. Only correct responses were included in the session data; complete session data is available upon request.

Preference Assessments

We first conducted a forced-choice (paired) preference assessment (Fisher et al., 1992) for edible items. A multiple stimulus without replacement (MSWO) preference assessment was conducted before each session (Windsor, Piche, & Locke, 1994), and the top five choices from the forced-choice assessment were used in the MSWO. The top choice in the MSWO was used for subsequent trials in that session. Because participants were older and vocal-verbal, they could choose if they wanted to do a pre-session MSWO or if they just wanted to verbally select a single edible. Most participants told the experimenter upon entering the room their choice before the options could even be presented.

Experimental Design and General Procedure

An alternating treatments design (Sindelar, Rosenberg, & Wilson, 1985) was used to evaluate magnitude effects. Sessions consisted of 10 trials each and one session per experimental condition was conducted per day, up to 5 days per week and up to 5 minutes between conditions. Each condition was assigned a different color cardstock on which the questions and answers were written. Session order was randomly selected without replacement; each target was conducted the same number of times per session without repeating the same target twice consecutively. Targets were randomly arranged before the start of each session. The participant was shown each group of colored cards before the sessions and then saw which was chosen for that session. A fixed time-delay prompting procedure was implemented with up to a 5-sec delay before prompting. The prompts included showing the participant the answer on the back of the card and allowing them to read aloud the answer on the back (textual prompts were used instead of verbal prompting to mitigate echolalic responding to the question and the prompt). For two participants, an additional observing response was required. Kammie needed to repeat the answer back during prompting to ensure that attention was on the card. Wilt required a 3x observing response that required him to read the textual prompt three times before moving to the next target. Teaching for targets continued until participants maintained at least 90% correct responding over three consecutive

sessions in all conditions except control. Generalization probes (with a novel person in a novel setting) were conducted during baseline and after mastery completion of all targets (excluding control). Targets were identified by the researcher by asking the participants personal information and safety questions from a list of one hundred pre-determined questions. Fifty questions were personal information and answered by the caregiver before presentation; the remaining fifty were safety questions based on different relevant safety issues with which the participants could come into contact (e.g., water safety, personal hygiene, road safety). For a question to be deemed correct, the participant had to deliver a response that was exactly as listed on the questionnaires or for questions with multiple answers, at least 80% of responses in a question needed to be exact.

Baseline. The experimenter placed each condition marker card on the table before beginning teach session. With the questions and answers hidden from the participant's sight, the experimenter then asked all of the questions for each condition one time. If the participant did not respond within 5-s, the trial ended. Regardless of responding, the experimenter did not present any consequences to the participant. A control condition, which matched baseline, was interspersed with the subsequent conditions for internal validity.

High-magnitude. For the first data point after baseline, the experimenter ran a training trial. They read each question to the participant and prompted the answer with a textual prompt that was written on the back of the card after a 0-s

time delay. Following the single training trial, the experimenter only delivered a double serving of a large edible item plus social praise in the form of neutral vocal feedback after each correct response. Participants were shown the textual prompt after incorrect responses (i.e., no responding after 5-s, saying, “I don’t know,” or delivering a response that did not match the card).

Low-magnitude. This condition was identical to the high-magnitude condition except the experimenter delivered a single portion miniature-sized edible plus social praise in the form of neutral vocal feedback for all correct responses.

Praise Only. This condition was identical to the high and low-magnitude conditions except the experimenter only delivered social praise in the form of neutral vocal feedback for all correct responses.

Social Validity

At the conclusion of the experiment, the caregivers of each participant were given an anonymous survey featuring four questions on a Likert Scale from 0-3 asking them how they felt knowing their child was able to answer personal information questions about themselves. The survey also contained one open-ended question allowing the caregivers to freely give feedback to the experimenter. Each caregiver was given their participant’s graph with an explanation in order to see what their participant accomplished through the course of the study.

Mean responding to question one, “Do you feel that information included in the experiment was useful for your child to learn?” was 2.67. Mean responding to question two, “Without assistance, could your child tell an adult [caregiver’s] name and phone number before starting this study?” was 1.67. Mean responding to question three, “Are you confident, at the close of the study, that your child would be able to answer personal information questions (such as parents’ names or phone numbers) if they needed help in a public place?” was 3. Mean responding to question four, “Is learning how to speak for oneself (personal autonomy) without the use of an aide or personal care assistant a skill you are interested in having your child continue to learn?” was 2.67. One of the caregiver’s open-ended question answer was, “It is equally important to understand when not to give out personal information.” This feedback can be addressed with future research.

Interobserver Agreement and Treatment Integrity

A second observer scored a minimum of 30% of trials of baseline and treatment sessions across all participants. Trial-by-trial inter-observer agreement (IOA) was calculated by dividing the number of agreements by the number of agreements plus the number of disagreements. This number was converted into a percentage. The second observer also took treatment integrity data for a minimum of 30% of treatment sessions and scored if the presenter delivered reinforcement within 1-2 seconds of correct responding, performed the time-delay prompt within

five seconds of lack of response, and runs the correct error correction procedure for all incorrect responses.

IOA for Kammie was 100% across all conditions. IOA for Nicholas was 100% across all conditions. IOA for Wilf was a mean percentage of 99.17% (range 98.33%-100%) per condition. Treatment Integrity was 100% for Nicholas and Wilf, and 94.29% for Kammie.

Results

Results for Kammie are depicted in Figure 1. Kammie's mean percentage of acquisition in baseline was 9.17%. Kammie reached mastery criterion in the high-magnitude condition first within fifteen sessions (mean percent of acquisition 78.13%), followed by the low-magnitude condition within seventeen sessions (mean percent of acquisition 78.75%), and finally the praise only condition within nineteen sessions (mean percent of acquisition 69.38%). Kammie responded correctly to a mean of 42.50% of questions in the control condition. Kammie's baseline generalization probe was 50% and her final generalization probe was 80%. After an 8-week period with no trials, Kammie maintained mastery criterion in only the high-magnitude condition, though anecdotally she was able to correct her mistakes for the questions missed in the low-magnitude and praise only conditions.

Nicholas' results are depicted in Figure 2. His mean percentage of acquisition in baseline was 7.5%. Nicholas reached mastery in the high-magnitude

condition first within ten sessions (mean percent of acquisition 75.56%), followed by the praise only condition within twelve sessions (mean percent of acquisition 67.78%), and finally in the low-magnitude condition within thirteen sessions (mean percent of acquisition 65.56%). Nicholas had a small spike in baseline at 10% but decreased back to zero levels for the whole of the study (mean percent of acquisition 3.33%). Nicholas' baseline generalization probe was 0% and his final generalization probe was 30%. Nicholas showed little improvement in the generalization probes because, at the start of the session, he stated that he would only give partial answers to the confederate because, "you can't talk to strangers." Wilf's results are depicted in Figure 3. His mean percentage of acquisition in baseline was 0%. Wilf reached mastery criterion in the low-magnitude condition first within fifteen sessions (mean percent of acquisition 81.05%), followed by the praise only condition within seventeen sessions (mean percent of acquisition 75.26%), and reached final mastery criterion in the high-magnitude condition within twenty-two sessions (mean percent of acquisition 71.05%). Wilf had a slight increase in baseline up to 20% but decreased back to zero levels for the remainder of the study (mean percent of acquisition 2.63%). Wilf's baseline generalization probe was 0% and his final generalization probe was 50%. Wilf had 0% in baseline because he engaged in emotional responding and ran away from the confederate to report a stranger to the experimenter.

Discussion

Two of the three participants (Kammie and Nicholas) acquired the skills more quickly in the high-magnitude condition. One participant (Wilf) acquired the skills more quickly in the low-magnitude condition. Kammie's generalization probes improved from 50% in baseline to 80% after training. Nicholas's generalization probes improved from 0% in baseline to 30% after training, though his lack of clinically significant levels of improvement can be attributed to his resistance to speak to novel people that he labeled as "strangers." Wilf's generalization probes improved from 0% in baseline to 50% after training.

The current study expands upon the literature on reinforcement magnitude. The high-magnitude reinforcer was most effective for two out of three participants (Kammie and Nicholas). One out of three participants was able to generalize skills to a novel person in a novel environment with 80% accuracy (Kammie). The research on reinforcement magnitude is consistent with these results. In the four most recent studies, Fiske et al. (2014), Boudreau et al. (2015), Paden and Kodak (2015), and Johnson et al. (2017) showed idiosyncratic results amongst their participants in the effects of reinforcement magnitude on acquisition. Johnson et al. (2017) attempted to show generalization of reinforcement magnitude effectiveness across different skills, but this effect was only present in one participant. Fiske et al. (2014) only had one participant out of three acquire targets most quickly in the

high magnitude/extinction condition. However, there was not an appreciable difference in the rate of acquisition between the different levels of magnitude for this one participant. Boudreau et al. (2015) obtained different results for all three of their participants. They compared the effects of different types of differential reinforcement (quality, magnitude, and nondifferential) on skills acquisition. Each participant in this trial acquired skills in a different condition first, and it took participants upwards of 500 training trials to reach mastery. Paden and Kodak (2015) found that the acquisition speed between the conditions for all participants was similar. Two out of four of their participants achieved mastery in the high-magnitude condition first, and the other two finished in the low-magnitude condition first. One participant exhibited variation in acquisition length between conditions, but the other three participants mastered each condition within a few sessions of the others.

In the current study, Kammie and Nicholas, the participants for whom the high-magnitude condition resulted in mastery most quickly, would come into session and ask for the colored card matching this condition, and they verbally reported that they were trying to obtain 100% to earn all of the edibles available. This suggests that these participants were sensitive to the magnitude of reinforcement delivered.

Wilf met mastery in the low-magnitude condition first, which shows that magnitude did have an effect on his acquisition. For Wilf, there were other

underlying environmental factors (e.g., medical diagnosis) which may have contributed to his resistance to acquire the skills. Wilf's caregiver informed the experimenter that the participant had been diagnosed as pre-diabetic and could no longer eat more than 10g of carbohydrates per meal. The experimenter tried to offer alternatives, such as fruits or vegetables, but the participant declined. At this point, a small cheese cracker was the only snack available that did not come close to the carbohydrate serving size limit. Given that Wilf was privy to his own medical diagnosis, he would sometimes decline to take food during sessions.

Two participants, Kammie and Wilf, each needed an additional observing response. Kammie was not attending to the error correction procedure, so the experimenter added in an observing response after four sessions and a drop in acquisition percentage. The observing response for Kammie was that she had to read the answer on the back of the card to the experimenter before the next question could be presented. Kammie needed the observing response to ensure to the experimenters that she was attending to the presented stimulus. Wilf independently engaged in the observing response of reading the answer back to the experimenter from the beginning of the study. However, after six sessions of no acquisition in the high-magnitude condition and mastery of the other conditions, the experimenter added a 3x observing response. For the 3x observing response, Wilf had to repeat the answer back to the experimenter three times during error correction before being able to move forward with the next question. Because Wilf was showing

signs of difficulty in acquiring the same two targets (i.e., phone numbers), experimenters added the observing response to promote acquisition and mitigate any possible future emotional responding if the participate had reached a point of frustration.

In the current study, each participant was able to reach mastery criterion of all conditions (excluding control) within 3-7 sessions of their initial condition mastered. This is similar to the results of Paden and Kodak (2015) in that acquisition rates were not largely affected by the difference in reinforcement magnitude. It also shows that these more advanced learners were able to acquire skills nearly as effectively in the absence of edibles as they were with the edibles. Removing positive facial affect and vocal tone from the vocal feedback seemed to pose no difference in acquisition, similar to that seen in Paden and Kodak (2015). The history of using social praise, though this was neutral and behavior-specific, may still have been a contributing factor to the acquisition rates for the participants in the current study.

The implications of the relative similar acquisition rates are positive for clinics that may want to avoid using reinforcers that could potentially be more difficult to fade or are less likely to match natural environment conditions. Learners who can acquire skills via verbal feedback only is more representative of natural environment learning where reinforcement may be subtle in delivery. Programmed reinforcers, such as candy or toys, can be expensive and potentially unhealthy. The

results of this study, which align with the recent literature on this topic, suggest that individualization of reinforcement structure is important, but that skill acquisition still occurs effectively even in the absence of what may be preferred by a learner. In Paden and Kodak (2015) and Fiske et al. (2014), when given a chance to choose which condition they preferred, participants chose the high-magnitude condition. Rates of acquisition did not necessarily align with their choice. The current study supports that praise in the form of neutral verbal feedback could serve as an effective reinforcer.

The results of the current study do not provide strong support that reinforcement magnitude makes an appreciable difference in rates of skill acquisition. However, anecdotal evidence supports that motivation for reinforcement magnitude is nevertheless important. The mastery criterion was set at 90%, which the participants knew; however, for two out of three participants (Kammie and Nicholas), they aimed to score 100% in order to obtain all available edibles. The sight of the leftover edibles on the plate likely signaled to the participants what score they received in either the high or low-magnitude conditions. Wilf would occasionally engage in emotional responding (e.g., smashing the leftover edibles) if he did not receive a perfect score. Wilf did experience satiation effects but also showed motivation to score well by collecting the crackers, requesting games to be played with the crackers, or putting the crackers in a bag to take home.

Even though the difference in acquisition rates was relatively slight across conditions (i.e., within 3-7 sessions) a difference of this size could have large implications when multiplied across tasks. That is, acquiring skills in 3-7 fewer sessions could dramatically enhance overall learning when considering the hundreds of skills many individuals with disabilities need to learn. Future research should examine if this 3-7 acquisition difference applies to other skills.

The addition of the observing response for two of the participants (Kammie and Wilf) was also a factor in the rate of acquisition. Nicholas never needed any prompting to read the cards to the experimenter, and his rates of acquisition were much faster than the other participants. Kammie and Wilf engaged in other behaviors, such as: looking around the room, playing with desk drawers, or looking away from the cards whenever they were presented. After the observation response was required, the rate of acquisition increased. While magnitude had an effect, the lack of attention to the stimuli and difficulty of some questions was a barrier to their success.

This study lacked a reinforcer assessment. Two of the recent studies featured reinforcer assessments as part of their procedures, Johnson et al. (2017) and Fiske et al. (2014). These reinforcer assessments served to aid in the evaluation of data for effectiveness of reinforcement magnitude and also as a basis of comparison for the choice probes (Fiske et al., 2014) or generalization across skills (Johnson et al., 2017). If the current study had implemented a reinforcer

assessment, it could have served to eliminate the confound between motivation and the effects of reinforcement magnitude on responding.

Each of the participants showed some acquisition in the control condition even though there were no programmed consequences, teaching, or training trials performed. This points to confounds between the effects of reinforcement magnitude and motivation. Kammie had the highest amount of acquisition in control with a mean percentage of 42.50%. She continued to respond to questions even in the absence of programmed consequences which means that there was some intrinsic motivation present. Wilf had two data points at 20% correct responding. He had stated to the experimenters that he needed to start learning those answers or he would never finish the experiment. When he reached mastery in the low magnitude condition, his responding returned to zero levels when experimenters continued to deliver nothing in return for responses in the control condition. This shows the connection between motivation and reinforcement. Nicholas acquired skills really quickly in the high magnitude condition (ten sessions). Motivation was high for receiving a double portion of a large edible. For Kammie and Wilf, this motivation to acquire not only the programmed reinforcement but other intrinsically motivating reinforcers (e.g., finishing sooner or experimenter approval) was present and inseparable.

Limitations

There were several limitations to the current study. The greatest of these limitations was the participants' access to the answers outside of the teaching sessions. These learners were all advanced vocal-verbal speakers with free access to the internet outside of the clinic. Although no evidence suggests that they used the internet to access answers, it is possible. Only one participant, Kammie, showed higher rates of acquisition in the control condition. It was believed that Kammie was asking family members for information outside of the session. Once the experimenter spoke to the caregivers, acquisition in the control condition ceased and stabilized at 50%. Wilf admitted to attempting to cheat by trying to acquire answers that were hidden during the control condition.

A second limitation was satiation to food across sessions. For one participant, Wilf, there were unforeseen medical issues that occurred prior to running sessions (described above). This limited him to only one food choice throughout the study. He refused the edibles presented or asked for other edible items. This satiation effect may have contributed to the delay in acquisition in the high-magnitude condition for Wilf due to avoidance of a double-serving of the larger sized food.

A third limitation was the focus on rote responding. Each question had specifically designated answers and deviation from those answers resulted in an

error. However, some of the safety questions could have had multiple appropriate responses in addition to those presented.

Another limitation of the study involves the generalization probes. In order to avoid choosing questions that could show experimenter bias, each of the ten questions were randomly selected by a number generator (1-40). Control questions were included within the random number generator. Control questions were never taught to the participants. This affected the scores for the generalization probes because the participants could not answer these. Still another limitation is that asking randomly selected questions did not reflect real life scenarios. That is, it is highly unlikely that a store employee or police officer would approach someone that is lost and ask them questions such as, "How do you stay afloat without a life jacket?"

Finally, this study never taught the information for generalization. All sessions occurred in the same place at the same time of day by the same person. No information was given to the participants about when one may need to share this information with a stranger.

Further Research

Expanding upon Johnson et al. (2017), future research could replicate the current study and assess generalization across verbal operants. Because the learners in the current study were advanced, using the procedures for high and low

magnitudes to test for effects on another verbal operant (e.g., tacts) would be advantageous. To mitigate challenges with finding answers outside of session, targets would need to be something difficult to learn independently, such as foreign language characters or auditory tacts such as bird sounds. Because Johnson et al. (2017) only found generalization across skills with one participant, future research should continue to evaluate these effects.

For the purposes of enhancing internal validity, future research should investigate a means to prevent access to the session information outside of teaching trials. A study comparing the effects of neutral feedback versus a smile and uptones should be conducted to test the full effect of praise on acquisition. Future research also should explore different ways to score intraverbal responding that expands upon the information taught in session. Intraverbal responding can be variable and, outside of rote responding, it can be difficult to capture a full range of available responses. Future research should probe "important" questions (i.e., those involving the participant's name, important phone numbers, and addresses) to see if that information generalizes across settings. To enhance generalization across people, future research could use an embedded multiple-probe design with the alternating treatments design to test questions in different settings with novel people. Finally, another possible route for future research is training to whom one may or may not give personal information. This could be trained by using confederates dressed as

police officers or emergency responders and then probing with actual law enforcement or emergency responders.

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Appendix A – Figure 1

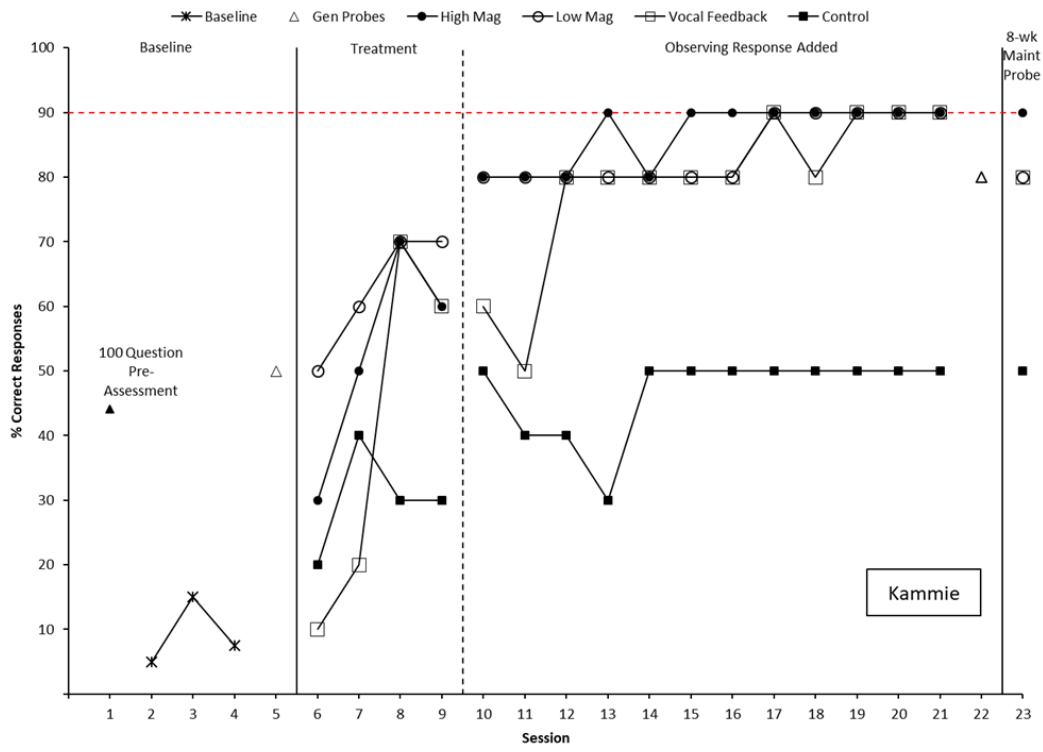

Figure 1. Kammie's performance across baseline and treatment conditions.

Appendix A – Figure 2

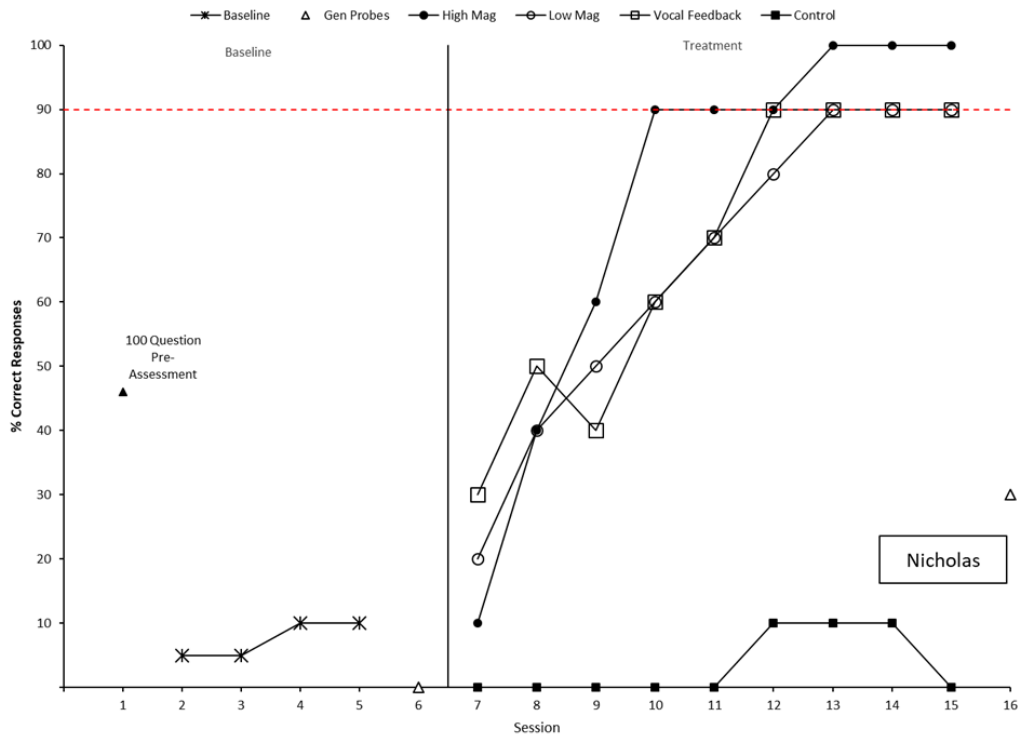

Figure 2. Nicholas' performance across baseline and treatment conditions.

Appendix A – Figure 3

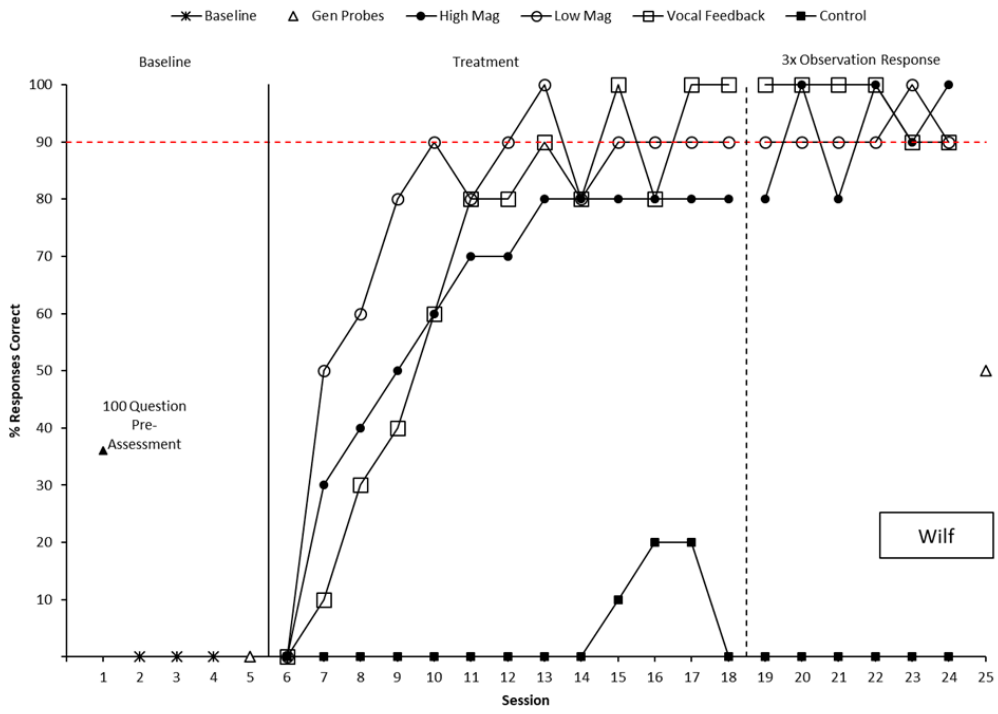

Figure 3. Wilf's performance across baseline and treatment conditions.

Appendix B – Participant 1 Data Sheet

Kammie Data Sheet Pre-Assessment Score = 44% *For more than five answers, accept one error of group. E.G., 4/5, 5/6 is a correct response.*

High Magnitude + Neutral Vocal Feedback (GREEN)
What is your dad's email?
xxxxxxxxxxxxxx@gmail.com
What are you allergic to?
(private)
(private)
What is your address?
5555 Main Street, Anywhere, US 12345
What is your home number?
(555)123-4567
What do you do if someone is choking?
Get help
Call 911
Heimlich Maneuver
What is your weight?
pounds
What is your occupation?
Student
What is one way to stay afloat?
Tread Water
When can you cross the street?
When the signal shows a white, walking man
When the signal says, "Walk"
What is your older sister's whole name?
(private)

Low Magnitude + Neutral Vocal Feedback (ORANGE)
What is your zip code?

12345
How should you enter the water?
Feet first
What is your diagnosis?
(private)
(private)
Who do you call in emergency?
Mom
Dad
What is your mom's whole name?
(private)
What is your dad's occupation?
(private)
What is your school's phone number?
(555)123-4567
What is your mom's cell number?
(555)123-4567
What is the best way to prevent getting sick?
Wash your hands
How often should you put on sunscreen?
Every 2 hours
Before going outside
After getting out of the water
After sweating a lot

Neutral Vocal Feedback Only (YELLOW)
What is your mom's occupation?
(private)
Who helps you in the water?
Lifeguard
What is your school's address?
5555 Main Street, Anywhere, US 12345
What is your height?
feet # inches
What is your dad's cell number?
(555)123-4567
What is your mom's email address?

xxxxxxxxxxxxxx@gmail.com
How can you tell if someone is choking?
Can't talk
Turning blue
Grabbing their throat
Why do you brush your teeth at night?
To prevent bacteria from growing
Who is your primary care physician?
Dr. John Smith
How often should you go to the dentist?
At least every 6 months

Control (PINK)
What is your nationality?
American
How long does it take to get to school?
15-20 minutes
Home alone, open door?
No one
Why is it important to prepare food safely?
To prevent food poisoning
What is your dad's work address?
5555 Main Street, Anywhere, US 12345
When should you brush your teeth?
In the morning
Before bed
After eating
Where should raw meat be stored?
On the bottom, underneath all other food
What kind of sunscreen is best to wear?
SPF15 or higher
What is your dad's work number?
(555)123-4567
Where were you born?
Anywhere, US

Appendix B – Participant 2 Data Sheet

Nicholas Data Sheet Pre-Assessment Score = 46% *For more than five answers, accept one error of group. E.G., 4/5, 5/6 is a correct response.*

High Magnitude + Neutral Vocal Feedback (GREEN)
What is your address?
5555 Main Street, Anywhere, US 12345
What is your weight?
pounds
What should you do when you sneeze or cough?
Cover your mouth with your elbow Turn your head away from work surfaces and other people
What is your grandma's email address?
xxxxxxxxxxxxx@gmail.com
Who do you call in case of an emergency?
Mom Grandmother
What is your grandma's occupation?
(private)
What is one way to stay afloat without a life jacket?
Tread water
How can you tell if someone is choking?
Can't talk Turning blue Grabbing their throat
When can you cross the street?
When the signal shows a white, walking man When the signal says, "Walk"
What do you do if you are home alone and can't wake up mommy?
Call 911

Low Magnitude + Neutral Vocal Feedback (ORANGE)
What kind of soap is best to use to kill germs?

Anti-bacterial
How often should you put on sunscreen?
Every 2 hours
Before going outside
After getting out of water
After sweating a lot
What is your school's phone number?
(555)123-4567
What is your mom's occupation?
(private)
Who do you live with?
(private)
(private)
(private)
(private)
Where were you born?
Anywhere, US
How many times can you reheat leftovers?
Once
What time do you wake up in the morning?
7:40AM
What is your mom's address?
5555 Main Street, Anywhere, US 12345
How often do you brush your teeth?
At least twice a day

Neutral Vocal Feedback Only (YELLOW)
What do you do if your clothes catch fire?
Stop, drop, and roll
What is your diagnosis?
(private)
(private)
(private)
(private)
(private)
What do you want to be when you are an adult?
ABA Therapist

What is your grandma's phone number?
(555)123-4567
What do you do if someone is choking?
Call for help
Call 911
Heimlich Maneuver
How long does it take you to get to school?
15-20 minutes
How often should you go to the dentist?
At least every 6 months
What is your grandma's address?
5555 Main Street, Anywhere, US 12345
Why do you brush your teeth at night?
To prevent bacteria from growing
What is your nationality?
American

Control (PINK)
What is your height?
feet # inches
When should you brush your teeth?
In the morning
Before going to bed
After eating
What is your school's address?
5555 Main Street, Anywhere, US 12345
What is your mom's email address?
xxxxxxxxxxxxxx@gmail.com
Who is your primary care physician?
Dr. John Smith
What do you find to be aversive?
Transitions
Too many things in a row to do
Being told I can't have something
Chores
Not getting my iPad
What is your occupation?

Student
Name some examples of personal hygiene.
Showering
Brushing teeth
Getting dental check ups
Taking care of your body
What kind of sunscreen is best to wear?
SPF15 or higher
What does a house-shaped sign mean?
School zone

Appendix B – Participant 3 Data Sheet

Wilf Data Sheet Pre-Assessment Score = 36% *For more than five answers, accept one error of group. E.G., 4/5, 5/6 is a correct response.*

High Magnitude + Neutral Vocal Feedback (GREEN)
Why do you brush your teeth at night?
To prevent bacteria from growing
When do you wear a life jacket?
When on a boat
When near open water (ocean, lake, etc)
When playing water sports
What is one way to stay afloat without a life jacket?
Tread water
When should you put on sunscreen?
Every two hours
Before going outside
After getting out of the water
After sweating a lot
What is your diagnosis?
(private)
(private)
(private)
What time do you leave for school?
7:40AM
What is your mom's occupation?
(private)
What is your height?
feet # inches
What is your dad's cell phone number?
(555)132-4567
What is your address?
5555 Main Street, Anywhere, US 12345

Low Magnitude + Neutral Vocal Feedback (ORANGE)
Where do you go during a hurricane/tornado?
A room with no windows
Hide in a bathtub
How many times can you reheat leftovers?
Once
Name some examples of personal hygiene?
Showering
Brushing teeth
Getting dental check ups
Taking care of your body
How should you enter the water?
Feet first
If home alone, who can you open the door for?
No one
What do you find aversive?
Lights
Noises
Who should you call in an emergency?
(private)
What is your mom's home address?
5555 Main Street, Anywhere, US 12345
What is your weight?
pounds
What is your mom's work phone number?
(555)132-4567

Neutral Vocal Feedback Only (YELLOW)
What kind of soap is best to use to kill germs?
Anti-bacterial
What kind of sunscreen is best to wear?
SPF15 or higher
Who helps you in the water?
Lifeguard
When can you cross the street?
When the signal shows a white, walking man

When the signal says, "walk"
How can you tell when someone is choking?
Can't talk
Turning blue
Grabbing their throat
Who are the adults you can trust?
(private)
(private)
(private)
(private)
What is your occupation?
Student
What is your dad's address?
5555 Main Street, Anywhere, US 12345
What is your mom's personal email address?
xxxxxxxxxxxxx@gmail.com
What is your nationality?
American

Control (PINK)
What are some ways to prevent drowning?
Never swim alone / Always swim with a friend or adult
Take swimming lessons
Wear a life jacket
Don't swim if you can't see the bottom of the water
What are some songs to help time handwashing?
ABC's
Happy Birthday
Where should raw meat be stored in the refrigerator?
At the bottom, underneath all the other food
Why is important to prepare food safely?
To prevent food poisoning
Who is your primary care physician?
Dr. John Smith
How long does it take you to get to school?
15-20 minutes
What is your school's address?

5555 Main Street, Anywhere, US 12345
What is your mom's work address?
5555 Main Street, Anywhere, US 12345
Where were you born?
Anywhere, US
What is your school's phone number?
(555)123-4567

Appendix C – Participant 1 Generalization Probes Data Sheet

Participant: Kammie	Participant: Kammie
Date:	Date:
Confederate Initials:	Confederate Initials:
Location:	Location:
For more than five answers, accept one error per group. E.G., 4/5, 5/6 is a correct response.	
Put a plus (+) in the box for yes, minus (-) in the box for no per answer.	

Question		Question	
What do you do if someone is choking?	Y / N	What do you do if someone is choking?	Y / N
Heimlich Maneveur		Heimlich Maneveur	
Call 911		Call 911	
Get help		Get help	
When can you cross the street?	Y / N	When can you cross the street?	Y / N
When the signal shows a white walking man		When the signal shows a white walking man	
When the signal says "Walk"		When the signal says "Walk"	
How should you enter the water?	Y / N	How should you enter the water?	Y / N
Feet first		Feet first	
What is your diagnosis?	Y / N	What is your diagnosis?	Y / N
(private)		*(private)*	
(private)		*(private)*	
What is your mom's occupation?	Y / N	What is your mom's occupation?	Y / N
(private)		*(private)*	
What is your school's address?	Y / N	What is your school's address?	Y / N
5555 Main Street, Anywhere, US 12345		5555 Main Street, Anywhere, US 12345	
How can you tell if someone is choking?	Y / N	How can you tell if someone is choking?	Y / N
Can't talk		Can't talk	
Turning blue		Turning blue	
Grabbing their throat		Grabbing their throat	
What is your nationality?	Y / N	What is your nationality?	Y / N
American		American	
Why is it important to prepare food safely?	Y / N	Why is it important to prepare food safely?	Y / N
To prevent food poisoning		To prevent food poisoning	
What is your dad's work number?	Y / N	What is your dad's work number?	Y / N
(private)		*(private)*	

Appendix C – Participant 2 Generalization Probes Data Sheet

Participant: Nicholas	Participant: Nicholas
Date:	Date:
Confederate Initials:	Confederate Initials:
Location:	Location:
For more than five answers, accept one error per group. E.G., 4/5, 5/6 is a correct response.	
Put a plus (+) in the box for yes, minus (-) in the box for no per answer.	

Question		Question	
What is one way to stay afloat without a life jacket?	Y / N	What is one way to stay afloat without a life jacket?	Y / N
Tread water		Tread water	
When can you cross the street?	Y / N	When can you cross the street?	Y / N
When the signal shows a white walking man		When the signal shows a white walking man	
When the signal says "Walk"		When the signal says "Walk"	
What do you do if someone is choking?	Y / N	What do you do if someone is choking?	Y / N
Heimlich Maneveur		Heimlich Maneveur	
Call 911		Call 911	
Get help		Get help	
What is your height?	Y / N	What is your height?	Y / N
# feet # inches		# feet # inches	
Who is your primary care physician?	Y / N	Who is your primary care physician?	Y / N
(private)		*(private)*	
What is your diagnosis?	Y / N	What is your diagnosis?	Y / N
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
What is your mom's occupation?	Y / N	What is your mom's occupation?	Y / N
(private)		*(private)*	
Why do you brush your teeth at night?	Y / N	Why do you brush your teeth at night?	Y / N
To prevent bacteria from growing		To prevent bacteria from growing	
Where were you born?	Y / N	Where were you born?	Y / N
(private)		*(private)*	
How often should you put on sunscreen?	Y / N	How often should you put on sunscreen?	Y / N
Every 2 hours		Every 2 hours	
Before going outside		Before going outside	
After getting out of the water		After getting out of the water	
After sweating a lot		After sweating a lot	

Appendix C – Participant 3 Generalization Probes Data Sheet

Participant: Wilf	Participant: Wilf
Date:	Date:
Confederate Initials:	Confederate Initials:
Location:	Location:
For more than five answers, accept one error per group. E.G., 4/5, 5/6 is a correct response.	
Put a plus (+) in the box for yes, minus (-) in the box for no per answer.	

Question		Question	
What is your height?	Y / N	What is your height?	Y / N
4'10"		4'10"	
Who are the adults you can trust?	Y / N	Who are the adults you can trust?	Y / N
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
Why is important to prepare food safely?	Y / N	Why is important to prepare food safely?	Y / N
To prevent food poisoning		To prevent food poisoning	
What do you find aversive?	Y / N	What do you find aversive?	Y / N
Noises		Noises	
Lights		Lights	
How many times can you reheat leftovers?	Y / N	How many times can you reheat leftovers?	Y / N
Once		Once	
Who is your primary care physician?	Y / N	Who is your primary care physician?	Y / N
(private)		*(private)*	
What is your mom's occupation?	Y / N	What is your mom's occupation?	Y / N
(private)		*(private)*	
What is your diagnosis?	Y / N	What is your diagnosis?	Y / N
(private)		*(private)*	
(private)		*(private)*	
(private)		*(private)*	
What time do you leave for school?	Y / N	What time do you leave for school?	Y / N
7:40AM		7:40AM	
What kind of soap is best to use to kill germs?	Y / N	What kind of soap is best to use to kill germs?	Y / N
Anti-bacterial		Anti-bacterial	

Appendix D - Informed Consent

Informed Consent

Please read this consent document carefully before you decide to participate in this study. The researcher will answer any questions before you sign this form.

Study Title: The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Teenaged Adolescents with Disabilities

Purpose of the Study: To test the effect of edible rewards (reinforcement) on the skill acquisition of answering questions for personal information

Procedures: Participants will be presented with four sets of ten questions each. Responses on two sets will be paired with edible rewards of varying sizes, the third will be a verbal praise statement, and the fourth set will serve as a test set with no feedback delivered (corrective or positive). Questions will come from a list that is tested by the researcher prior to beginning. Caregivers will be given access to the questions, so that they will know exactly what will be asked of their child. They will also tell the researcher the answers to questions that the researcher may not otherwise have access to.

Before beginning the study and at the conclusion of the study, new people in new settings (outside of the study) will ask some of the questions to participants to ensure they will answer questions in new situations and not just trained situations.

A survey of the potential questions for the study will be provided to caregivers. These responses will be taught to the participants during the course of the study. Anonymous surveys will be conducted at the end of the study for the caregivers to share their likes and dislikes of the study.

Potential Risks of Participating: Disclosure of disability, study could be time consuming if skill acquisition rate is low, participant will be given food and may satiate on certain foods

Potential Benefits of Participating: Gain independence by speaking for themselves, learn how to answer questions about personal information to increase safety, will add to the body of literature surrounding using food rewards during skill acquisition.

Confidentiality: Your identity will be kept confidential to the extent provided by law. Your information will be assigned a code number/name, instead of any personally identifying information. Once code numbers/names are assigned, there will be no future use of identifying information kept. Your name will not be used in any report. Only three people (Lead Researcher, Assistant Researcher, and Thesis Advisor) will have access to data, inter-observer agreement data, treatment integrity data, and any other data collected during sessions.

Voluntary participation:
Your participation in this study is completely voluntary. There is no penalty for not participating. You may also refuse to answer any of the questions we ask you (there will be questions about disclosing health related information including diagnosis and blood type).

Right to withdraw from the study:
You have the right to withdraw from the study at any time without consequence.

Whom to contact if you have questions about the study: Rachel Thomas, RBT
(contact information removed)

Whom to contact about your rights as a research participant in the study:
(contact information removed)

Agreement:

☐ I have read the procedure described above. I voluntarily agree to participate in the procedure, and I voluntarily agree to disclose information including diagnosis, blood type, and other related health questions. I have received a copy of this description.

☐ I have read the procedure described above. I voluntarily agree to participate in the procedure, and I **DO NOT AGREE** to disclose information including diagnosis, blood type, and other related health questions. I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

Appendix D - Informed Consent for Video Recording

Informed Consent for Video Recording

Please read this consent document carefully. Before you decide to participate in this study, please be aware that all video sessions must be recorded for the purposes of agreement between researchers and to ensure treatment is delivered according to the standards as listed in the IRB. The researcher will answer any questions before you sign this form.

Study Title: The Effects of Reinforcement Magnitude on Unprompted Intraverbal Responses to Mands for Personal Information in Teenaged Adolescents with Disabilities

Purpose of the Study: To test the effect of edible rewards (reinforcement) on the skill acquisition of answering questions for personal information and safety.

Confidentiality: Your identity will be kept confidential to the extent provided by law. Only three people (Primary Investigator, Assistant Researcher, and Thesis Advisor) will have access to these videos. **All recorded sessions will be for the sole purpose of agreement between researchers. Once data is collected and analyzed, all video footage will be destroyed.**

Voluntary participation:
Your participation in this study is completely voluntary. There is no penalty for not participating. You may also refuse to answer any of the questions we ask you.

Right to withdraw from the study:
You have the right to withdraw from the study at any time without consequence.

Whom to contact if you have questions about the study: Rachel Thomas, RBT
(contact information removed)

Whom to contact about your rights as a research participant in the study:
(contact information removed)

Agreement:
I have read the procedure described above. I voluntarily agree to have all sessions recorded for the sole use of the researchers and the thesis advisor, and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

Appendix E - Treatment Integrity Data Sheet

	Session Date	Session Date	Session Date	Session Date	Session Date
	Exp / Tx	Exp / Tx	Exp / Tx	Exp / Tx	Exp / Tx
Did the researcher present each condition card before beginning?	Y / N	Y / N	Y / N	Y / N	Y / N
Did the researcher present a prompt (show the card, no talking) immediately upon an error?	Y / N	Y / N	Y / N	Y / N	Y / N
Did the researcher deliver a prompt after 5s of no response?	Y / N	Y / N	Y / N	Y / N	Y / N
Did the researcher deliver the correct reinforcer for the condition?	Y / N	Y / N	Y / N	Y / N	Y / N
Did the researcher deliver an echoic response with all correct responses (except control)?	Y / N	Y / N	Y / N	Y / N	Y / N

Appendix F - Social Validity Survey

Participant and Caregiver Feedback Survey – This survey is completely anonymous. Please feel free to answer honestly and include any information that you feel is necessary! Thank you again so much for your participation in the study!

0 = Not at all/No confidence 1 = A little/Low confidence 2 = Maybe/Moderately Confident 3 = Yes, very much/Extremely Confident

1. Do you feel the information included in the experiment was useful for your child to learn?

   0 1 2 3

2. Without assistance, could your child tell an adult your name and phone number before starting this study?

   0 1 2 3

3. Are you confident, at the close of the study, that your child would be able to answer personal information questions (such as parents' names or phone numbers) if they needed help in a public place?

   0 1 2 3

4. Is learning how to speak for oneself (personal autonomy) without the use of an aide or personal care assistant a skill you are interested in having your child continue to learn?

   0 1 2 3

5. Do you have any feedback for the researcher positive or constructive?

   _____

   _____

   _____

   _____

   _____

   _____