

**The Effects of Reinforcer Magnitude Using Social Reinforcers on Skill Acquisition for
Children Diagnosed with Autism**

Carrie Lynn Gray

A Dissertation Submitted to the Faculty of
The Chicago School of Professional Psychology
In Partial Fulfillment of the Requirements
For the Degree of Doctor of Philosophy in Applied Behavior Analysis

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2019

Approved By:

Julie Ackerlund Brandt, PhD, BCBA-D, Chairperson
Assistant Professor, Applied Behavior Analysis Online Program

Annette Griffith, PhD, BCBA-D, Member
Assistant Professor, Applied Behavior Analysis Online Program

Yors Garcia, PhD, BCBA-D, Member
Assistant Professor, Applied Behavior Analysis Online Program

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Abstract

Reinforcement is a consequence of behavior that explains why people do the things they do. Attention is a form of reinforcement that does not require any additional materials and is readily available. Attention, or social reinforcement, appears as either vocal verbal praise, or physical attention. Praise consists of verbal statements such as “Good job” or “Fantastic,” and physical attention consists of social interactions such as tickles, fist bumps, or high-fives. This study consisted of three parts. Study one evaluated the effects of different magnitudes of attention on skill acquisition. Children diagnosed with autism between the ages of 5 and 14 and receiving applied behavior analysis therapy services participated in this study. A multielement design investigating three independent variables was used: praise, physical attention, and a combination of both praise and physical attention. It was hypothesized that skill acquisition would occur across each condition; however, a significant difference was expected in the combination condition. A concurrent study assessed the preference of attention conditions. A preference assessment was conducted each session block, where the participant chose which condition they would like to initiate. Attention as the sole reinforcer was evaluated and provided support to extend the literature to include the efficacy of attention alone as a reinforcer when other topographies (i.e., tangibles, edibles) are unavailable.

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Chapter 1: Nature of the Study

Background

The principle of reinforcement means that the future likelihood of a response that is consistently followed by the addition of preferred stimuli (positive reinforcement), or the removal of aversive stimuli (negative reinforcement), is likely to increase (Cooper et al., 2007). For example, handing in completed homework may be positively reinforced by the provision of a sticker or treat from a teacher (i.e., provision of preferred items), or drinking water may be negatively reinforced by satiating thirst (i.e., removing an aversive context or bodily feeling). The specific reinforcers may vary, such as access to tangible stimuli (i.e., food or toys), social reinforcement (i.e., praise or high-fives), or escape (i.e., break from homework). Reinforcement is often used in skill acquisition programs to increase the likelihood of correct responses occurring in the future, which leads to increased skill mastery.

Multiple studies have supported the use of positive and negative reinforcement to increase skill acquisition. Fiske et al. (2014), for example, used a differential reinforcement procedure where tangibles and edibles were presented during skill acquisition tasks. The cumulative number of responses recorded at the end of the study indicated a significant increase of acquired targets with the delivery of large amounts of reinforcer. In another study, Kang et al. (2013) used tangible and social reinforcers. The dependent variables measured included skill acquisition and task engagement, both of which were observed to increase with tangible and social reinforcers. Skill acquisition is often presented in specific teaching formats that include the presentation of a target or discriminative stimulus, a response, and a consequence (a prompt or reinforcement). One such example is discrete-trial training (DTT), a procedure commonly used to teach new skills. Paden and Kodak (2015) and Carroll et al. (2015) conducted separate studies evaluating the effects of different types of reinforcement on skill acquisition during DTT sessions. Paden and Kodak used positive reinforcement procedures, while Carroll et al. used

negative reinforcement procedures. Both studies yielded increased skill acquisition and supported the use of positive and negative reinforcement for skill acquisition.

Although the type of reinforcement, whether positive or negative, is important, so is the strength of a reinforcer during skill acquisition programs. Various components may increase or decrease the efficacy of a stimulus as a reinforcer, including immediacy, magnitude, and quality (Neef et al., 1994). One of the most common procedural components behavior analysts working in service delivery include in individualized treatment plans is a specified or random rate; however, another dimension that should be considered is the magnitude of a reinforcer (Hoch et al., 2002). Magnitude refers to the value of the reinforcer, whether by quantity, duration, or frequency of delivery. Oftentimes, the behavior is completely absent from the student's repertoire, which increases the effort necessary to engage in the behavior. In addition, there are different topographies of reinforcers that may be considered for a skill acquisition program. For example, the delivery of tangible items (i.e., toys or food) is topographically very different from the delivery of attention (i.e., praise or high-fives). Although the delivery of these reinforcers varies topographically, the magnitude of reinforcement (i.e., amount, percentage, or duration of reinforcer delivered; Bonem & Crossman, 1988) may be evaluated using similar procedures.

Problem Statement

Positive reinforcement is widely used in ABA therapy sessions during skill acquisition and behavior reduction procedures (Kang et al., 2013). Stimuli chosen for reinforcement often includes leisure items or edible items; however, these items are not always easily accessible or quickly consumed. Delivering edibles, for example, relies on having bite-sized pieces of a preferred food available and ready, knowledge of any diet restrictions or allergies, and time needed to chew and swallow. Children diagnosed with autism often engage in stereotypic, problematic behaviors with leisure items, increasing the difficulty of using leisure items as

effective reinforcers (Kang et al., 2013). Another issue with leisure items is identifying items that can be quickly played with and removed without evoking problematic behaviors. Having edibles and leisure items available while transitioning from one setting to the next can also create difficulty in delivering reinforcement effectively. On the other hand, when attention is delivered as reinforcement, service delivery providers can transition between settings freely without transporting additional items such as the edible and leisure items previously mentions. In addition, social reinforcers promote social interactions which presents as a significant deficit across much of the population diagnosed with autism (Kang et al., 2013). Continued research regarding attention and social reinforcers is needed to examine the benefits and potential risks they pose across skill acquisition programs, behavior reduction programs, and varying populations. This study explored how attention, which does not require any materials to be prepared or carried, can be delivered in any setting, by any provider, producing quicker delivery of reinforcement and shorter intertrial durations.

Purpose of the Study

Reinforcement has been studied for decades, from positive and negative reinforcement and schedules of reinforcement to skill acquisition and behavior reduction; however, the literature is limited in evaluating attention as a reinforcer for skill acquisition (Fiske et al., 2014). Additionally, reinforcer magnitude has not been widely evaluated with attention stimuli. Attention, whether as vocal verbal stimuli or physical stimuli, provides many advantages to service delivery. Social reinforcement is consistently available, does not require additional materials, is quickly and easily delivered, and does not require additional costs to purchase materials.

The purpose of this study was to replicate and extend the behavior analytic literature base on reinforcer magnitude by evaluating different topographies and magnitudes of attention. This study built upon the literature on social reinforcement, reinforcer magnitude, and skill

acquisition. Additionally, by evaluating reinforcer magnitude of different topographies of attention only, the study extends and informs the current literature to include more information regarding the efficacy of attention as a reinforcer when other types of reinforcers (i.e., tangible stimuli) are unavailable.

Research Questions and Hypotheses

The present study sought to answer the following research questions: What is the effect of reinforcer magnitude with attention-based reinforcers on skill acquisition? Secondly, do children diagnosed with autism show preference across different types of attention-based reinforcers?

Significance of the Study

Behavior analysts and other providers who use principles of reinforcement may benefit from the results of this study. Providing appropriate tangible reinforcement in a variety of settings can be a challenge due to needing leisure or edible items on hand. Many of these tangible items have the potential of being difficult to carry or, for some edibles, too messy to transport across settings. Attention, on the other hand, does not require materials and can be delivered easily and immediately. Praise statements, for example, are a simple and natural strategy shown to have positive effects on skill acquisition as well as behavior (Haydon & Musti-Rao, 2011).

Few studies have evaluated the effects of reinforcement magnitude on skill acquisition. There are limited resources outlining the how much of the reinforcer to deliver during skill acquisition procedures (Trosclair-Lasserre et al., 2008).

Summary

In summary, positive reinforcement is widely used for both skill acquisition and behavior reduction interventions. Positive reinforcement can be delivered using multiple types of stimuli,

such as edibles (candy, crackers), leisure items (toy, book), or attention (praise, physical contact). While edible and leisure stimuli have been proven to be highly effective, they also pose multiple problems within service delivery models. Attention, on the other hand, is freely accessible, and can be delivered immediately without the need of having materials ready.

Chapter 2 will present a review of relevant literature that discusses an array of research on social reinforcement, preference and effectiveness of social reinforcement, and reinforcer magnitude. Chapter 3 provides details regarding this study such as the method and research design. Chapter 4 presents the results, followed by Chapter 5, which summarizes the findings and implications of this study.

Chapter 2: Review of the Literature

Reinforcement is a behavioral process that explains why some behaviors occur. Put simply, reinforcement includes stimuli that follow a behavior and increase the probability that behavior will occur again in the future. Attention is one such stimulus that may be used as a reinforcer and that does not require additional materials. Within applied behavior analytic therapy sessions, the availability of preferred tangibles and edibles are often limited; however, attention is consistently available. There are many types of attention stimuli, but two of the most common are praise and physical attention. Praise consists of verbal statements such as “Good job” or “Fantastic job sorting,” and physical attention consists of interactions where the therapist and child make physical contact such as tickles, fist bumps, or high-fives.

Preference of social reinforcers can be difficult to assess, especially with children who have an autism diagnosis, because their social interaction skills are often significantly delayed or deficient (McConnell, 2002). Traditional preference assessments such as the paired-stimulus (PS; Fisher et al., 1992) or multiple-stimulus without replacement methods (MSWO; DeLeon & Iwata, 1996) require the presentation of stimuli in an array from which the participant may select the preferred stimulus. Unfortunately, because social interactions are not tangible, they cannot be presented in the same manner during preference assessments (Nuernberger et al., 2012). To combat this, Nuernberger et al. (2012) provided an array of photographs representing the various social interactions available. For example, a photograph depicting the researcher and participant engaging in a high-five or the researcher tickling the participant. Photographs of non-physical attention is more difficult; however, this type of attention can be represented by a thumbs up or speech bubble above the researcher’s face (Nuernberger et al., 2012).

Types of Social Reinforcers

There is abundant research on the different types of socially mediated, tangible reinforcers. Karsten and Carr (2009), for example, evaluated the effects of food and praise on skill acquisition. A MSWO preference assessment was conducted to identify foods that would function as a reinforcer. The three highest ranking foods were then used during the intervention phase of the study. The food items were paired with praise, which yielded increased responding compared to praise alone; however, responding did occur with praise alone. Kang et al. (2013) completed a study using tangible reinforcers during intervention. Edible items were provided in the Fiske et al. (2014) study as well. Each of these studies are similar in that some form of tangible reinforcer was provided, whether food or leisure items, and a functional relationship was found between the dependent and independent variables.

There is also ample research on the effectiveness of attention as a reinforcer for problem behavior (Fahmie et al., 2013; Fisher et al., 1996; Kodak et al., 2007) and more recently for appropriate behavior (Broden et al., 1970; Clay et al., 2013; Nuernberger et al., 2012; Smaby et al., 2007). Within the past 7 years, researchers have also begun to evaluate different types of attention such as praise and physical contact (Clay et al., 2013; Nuernberger et al., 2012), similar to how many have evaluated different types of edible stimuli or leisure activities (DeLeon & Iwata, 1996; Fisher et al., 1992; Piazza et al., 1996).

Some researchers have evaluated the efficacy of praise in relation to behavioral increases and skill acquisition. Polick et al. (2012) compared the effects of two types of praise on the acquisition of intraverbal behavior. Two male children with an Autism Spectrum Disorder (ASD) diagnosis, ages 3 and 4, participated in this study. Behavior-specific and general praise are often incorporated into behavior-analytic interventions as an additional reinforcer delivered to edible or tangible items. Meaning, following an independent and/or correct response, the therapist delivers an edible reinforcer (crackers) and also provides a

praise statement (“Great job!”) at the same time. Behavior-specific praise statements include an exclamation and the behavior response. For example, if a student responds to a question “what says moo?” by saying “cow,” the behavior specific praise statement would be “Great job! A cow says moo.” General praise statements, on the other hand, simply state the exclamation, such as “great job” or “you got it.” Polick et al. (2012) measured percentage of correct trials using an adapted alternating treatments design with an embedded concurrent multiple baseline design. Correct responses were followed by either a general praise statement (i.e., “great job!”), or a descriptive praise statement (i.e., “great job saying dog!”). Each praise statement was delivered with an enthusiastic tone. Although acquisition was observed in both conditions, descriptive praise statements produced quicker mastery than general praise statements. The primary limitation of this study was the level of difficulty of skills presented. For example, one participant mastered a set of targets more quickly than the next set, without differences in the intervention, which may indicate the difficulty level was not properly assessed (Polick et al., 2012).

Stevens et al. (2011) evaluated the effects of token delivery with and without behavior-specific or general praise on the acquisition of tacts for two male participants who were both diagnosed with a developmental disability. Tokens were delivered during baseline on a fixed schedule and produced minimal increases in responding. However, once praise statements were included, both participants exhibited increased responding across the conditions. Unfortunately, the similarity in the level of behavior across conditions did not support the use of one praise type over the other; although, there was support for the provision of praise in addition to a token system in a skill acquisition program.

Establishing Preference of Reinforcers

Clay et al. (2013) also evaluated participants’ preferences for, and reinforcing efficacy of, different types of social interactions. Five participants between the ages of 6 and 17 were

selected for this study. The dependent variable in this study was preference of social interaction, which was defined to include interactions such as high fives, tickles, and so forth, and the independent variable was the delivery of the various interactions which were found to be highly preferred based on a preference assessment. Following the preference assessment, the highest-preferred form of attention was used during intervention and served as an effective reinforcer across participants. This study provides support for the use of social interactions as a reinforcer; however, this study focused on the *physical* interactions of attention and did not evaluate praise or vocal attention. These are also commonly used types of social interactions; however, given their topographic differences, they may not be as salient or preferred as physical interactions. More research on these, possibly less-salient, social reinforcers in comparison to physical interactions or tangible reinforcers is needed.

More recently, Clay et al. (2017) conducted a study to assess preference for components of social interaction. The authors broke down the interactions into tangible and physical or vocal components. Tangible components included items that may be given to the participants, such as edible items or toys. Physical components included methods of physical contact such as tickles, head rubs, squeezes, etc. Vocal components included strictly vocal-verbal stimuli such as praise, songs, and conversation. This study included four phases: preference assessment within stimulus classes, preference assessments across stimulus classes, concurrent- operants reinforcer assessment of individual components, and concurrent-operants reinforcer assessment of combined components (Clay et al., 2017). Forced choice preference assessments were used in phase one across each stimulus class individually. Phase two used a paired-stimulus preference assessment with the top three preferred items from each stimulus class. Reinforcing efficacy across the stimulus classes was assessed in phase three using response-restriction methods. Finally, phase four tested the reinforcing efficacy of physical

and vocal stimuli alone and combined. Phase three results indicate that the edible components were highly preferred over both physical and vocal interactions for all the participants. However, when edible stimuli were restricted or unavailable, the highest-preferred physical consequence produced high response rates (Clay et al., 2017). Phase four results indicate increased responding with a highly preferred physical consequence. Access to social stimuli were not restricted outside of experimental sessions, which was identified as a potential limitation. Also, social stimuli were not evaluated in acquisition or maintenance of novel responses.

Assessing preference of social reinforcement can be difficult with children who are diagnosed with autism due to significantly impaired social skills (McConnell, 2002). Traditional preference assessments typically require the presentation of stimuli, whether in photographs or objects, such as the paired-stimulus (PS; Fisher et al., 1992) or multiple-stimulus without replacement methods (MSWO; DeLeon & Iwata, 1996). Attention, however, is not tangible and cannot be presented in the same manner during preference assessments (Nuernberger et al., 2012). Therefore, Nuernberger et al. (2012) sought to determine if different types of social interactions could be assessed in a preference assessment, and whether the preferred activities would function as reinforcers. The preference assessment results included clear preference hierarchies across social interactions for two of three participants, and although all social interactions produced increased responding from baseline, the higher-ranked social interactions were also associated with high levels of responding; whereas, lower-ranked social interactions were associated with low levels of responding (Nuernberger et al., 2012). This indicates that different types of social interaction, like different types of tangible items, will function differentially as reinforcers.

Defining Reinforcer Magnitude

Reinforcer magnitude refers to the quantity, intensity, or duration of the reinforcing

stimulus provided for correct and/or independent responding (Trosclair-Lasserre et al., 2008). Trosclair-Lasserre et al. (2008) evaluated basic relations among reinforcer magnitude, preference, and efficacy with children diagnosed with ASD. Tangible reinforcers and attention were assessed in each condition. Trosclair-Lasserre et al. measured the cumulative number of acquired responses across conditions in which magnitude was manipulated between small and large amounts. The authors observed higher levels of responding under conditions in which the larger-magnitude reinforcer was delivered. Satiation effects were identified as a limitation of this study as a result of the same items being presented repeatedly which could, over time, create a loss of reinforcer efficacy. Satiation may be a concern when evaluating magnitude because, if you are using a larger magnitude, satiation may occur more quickly, particularly if edible items are used as reinforcers. It may be interesting to evaluate whether satiation effects are as similarly less likely with some stimuli (i.e., social reinforcers which are not consumed) than others (i.e., edible items which are consumed).

Fiske et al. (2014) replicated Trosclair-Lasserre et al. (2008) and measured the effects of magnitude using different types of reinforcers including edibles (i.e., chips or candy) and play activities (i.e., pretend play or electronic games) within a differential reinforcement procedure on skill acquisition with three participants diagnosed with ASD. The purpose of this study was to determine the effects of manipulating the magnitude of reinforcement on skill acquisition.

Tangible reinforcers used included both edible items and leisure activities. Preference assessments were conducted to determine the top three preferred items or activities for each participant. Examples of edibles selected include candy, chips, and fruit gummies; examples of leisure activities selected include playing with a ball, an electronic fishing game, and a noisemaker. Magnitude was defined in this study as the quantity of the reinforcer delivered,

such as number of pieces of candy or duration of access to leisure items. Their results were consistent with previous studies, meaning all participants demonstrated a preference for the larger amount of reinforcement and had increased responding during the larger-magnitude experimental condition. However, they did not implement a control condition, which limits the external validity and generality of the results.

Lerman et al. (2002) also measured the effects of reinforcement magnitude; however, they extended their evaluation to various characteristics of responding, such as rate and post-reinforcement pause (PRP). Three participants were selected for this study, two males and one female, ages 4, 10, and 20 respectively. Each of the participants engaged in problem behaviors (i.e., disruption, aggression, and self-injury), and the targeted replacement behavior was touching a communication card. A functional analysis was conducted prior to the study to determine the maintaining consequence of problem behavior across participants. The primary functional reinforcer identified for each participant was used during the intervention to maintain the alternative behavior, touching a communication card. Access to leisure and edible items were primary across participants. Communication training was implemented by exposing the problem behaviors to extinction and using the tangible reinforcer to shape the alternative behavior. In a second experiment, magnitude was manipulated. Three conditions were introduced, small- magnitude (20 s), medium-magnitude (60 s), and large-magnitude (300 s). Results from experiment 1 show reduced frequency of problem behavior with low to moderate rates of card touching, however there was not a statistically significant difference in responding between the magnitudes of reinforcement in either experiment. Although no limitations were specifically mentioned, the authors did suggest additional research on conditions that produce reliable relations between reinforcement magnitude and responding be conducted (Lerman et al., 2002).

Paden and Kodak (2015) attempted to bridge the gaps in previous literature by adding

an attention-based reinforcer to their evaluation of the effects of reinforcement magnitude on skill acquisition with four male children diagnosed with ASD. During baseline, the authors provided brief, verbal praise for correct responses. During the magnitude evaluation, edible items were also provided in differing amounts across the small- and large-magnitude conditions, which were compared to a praise-only condition. The authors also evaluated the participants' preference for the different magnitude conditions. All participants showed a preference for the large-magnitude reinforcer; however, skill acquisition rates did not vary between the large- or small-magnitude conditions or the praise-only condition. Responding levels were similar across the praise-only and edible conditions of this study; that may imply that although praise may be a functional reinforcer alone, it may not combine with other tangible reinforcers to create a greater magnitude effect. It is also possible that other social reinforcers, such as physical contact or conversation- based interactions, may have had different effects than praise alone.

Summary and Purpose

Multiple studies have evaluated the effects of reinforcement magnitude; however, few have applied reinforcement magnitude to attention-based reinforcers, and all have included a tangible reinforcer as well. Similarly, while the research evaluated has shown that social reinforcement influences skill acquisition, there has been little research on confirming preferred social reinforcement in individuals with disabilities such as autism.

Another limitation in the current literature is that few researchers have evaluated the effectiveness of social reinforcement without the concurrent use of leisure or edible reinforcement. Much of the historical research regards the use of attention in increasing behavioral problems; however, the culmination of current research presents a positive prospect for the use of social reinforcement in behavioral increases, but there are aspects of this type of reinforcement that still need to be evaluated.

The purpose of the current study is to address these limitations by evaluating different magnitudes of social reinforcement, examine the effects of social reinforcement on skill acquisition, and determine preference for social reinforcement. Evaluating these variables is critical to the behavior analytic literature as it will provide more information regarding the efficacy of attention as a reinforcer when other types of reinforcers (i.e., tangible stimuli) are unavailable.

Chapter 3: Research Design and Method

Chapter Overview

The purpose of this study was to evaluate reinforcer magnitude using social reinforcement on skill acquisition. Social reinforcement consists of attention provided by either vocal verbal praise, (“Good job”), or physical attention, (tickles, high 5 high-five). Magnitude of attention was assessed in small and large amounts or durations depending on the type of attention being delivered. For example, in the praise condition, magnitude was measured by the number of statements provided; whereas in the physical attention condition magnitude was measured by the duration attention was delivered.

Research Questions and/or Hypotheses and their Rationales

A concurrent multiple baseline across participants with an embedded multielement design was used to assess the effects of different types of attention and reinforcer magnitude on skill acquisition. The primary measurement was total skill acquisition, which was monitored by a cumulative record of mastered targets. Secondly, the average percentage of correct responses per session was calculated as well as session duration. The multiple baseline measured the frequency of correct responses during skill acquisition trials without the presence of reinforcement for different periods of time across participants. Following baseline, three independent variables and a control condition were rapidly alternated across sessions. The independent variables included praise-only, physical-only, and combination (praise + physical). These three conditions were quasi-randomly alternated so that each condition was not conducted for more than two consecutive sessions. A preference assessment was conducted prior to the intervention conditions to determine preferred topographies of physical attention. Therefore, the topography of physical attention delivered may differ across participants; however, this is consistent with previous research showing that different types of physical attention are differentially reinforcing for different individuals (Clay et al., 2013; Clay et al., 2017; Nuernberger et al., 2011).

Participants

Three children, ages 5, 10, and 14-years-old, were recruited and selected to participate in this study. Participants were recruited from a local Applied Behavior Analysis (ABA) therapy provider serving children diagnosed with ASD. A letter describing the study and criteria for participation was delivered by the supervising BCBA for each potential participant within the research area (Appendix A). Inclusion criteria included an existing diagnosis of ASD, active participation in ABA therapy services consisting of a minimum of 10 hours per week, and a treatment plan consisting of skill acquisition goals. Participants were required to remain seated and on-task for a duration of at least 2 minutes. Verbal consent to participate was obtained following delivery of the letter. At this time, written informed consent was provided to each participants' parent/guardian (Appendix B). The experimenter was available to answer any questions regarding the study. Signed written consent forms were obtained prior to the study beginning. At the time informed consent was obtained, the experimenter interviewed each parent/guardian to assess for potential preferred items (Appendix C).

Danny, a 5-year-old male, receives approximately 30 hours of direct 1:1 ABA services each week. His primary diagnosis is ASD. He attends pre-kindergarten at the public school for half a day. Danny's communication skills include limited vocal verbal speech with sign language. He can produce echoic sounds as well as imitate a wide array of gross and fine motor skills. Danny's reading skills were limited, as he could identify approximately five letters and only words related to movie production logos prior to the start of this study.

Richard, a 10-year-old male, receives approximately 15 hours of direct 1:1 ABA services each week. Richard is diagnosed with ASD and is high functioning. His primary deficits are exhibited in social and adaptive behavior skills. Richard's reading skills are at a 4th grade reading level, therefore the skill that was addressed during this study was telling time on an analog clock.

Finally, Kevin, a 14-year-old male, is currently receiving 20 hours of direct 1:1 ABA services. Kevin's primary diagnosis is Down Syndrome, with ASD as secondary. He is at a moderate functioning level with a variety of methods of communication and some independent living skills. Kevin emits vocal verbal speech, uses sign language, and uses an alternative communication device. His vocal verbal speech is often difficult to understand due to his inability to pronounce many sounds. His reading level is low, as he only recognizes familiar names; however, he does recognize the letters of the alphabet and identifies approximately 15 letter sounds.

Materials

Materials for this study included task materials such as a list of randomly selected targets unique to the skill level of each participant (Tables 1, 2, and 3), different colored flash cards depicting each target for each condition, and other stimuli for specific programs. An index box plastic container was used to hold the flash cards for each participant. Within the container 6 dividers were used to separate targets within each condition as well as low and high magnitude (Appendix D). Data collection materials included paper data sheets (Appendix E), pens, and a timer. Additional materials included an iPad to record the session for primary and reliability data collection. Discriminative stimuli, such as colored index cards and photos were also included to enhance the saliency of the different conditions. The photos used included the experimenter and participant engaging in each form of physical attention, as well as the experimenter providing a "thumbs up" to represent praise (Appendix G).

Table 1*Target list for Danny*

Baseline	Low Magnitude Praise	Low Magnitude Physical	Low Magnitude Combo	High Magnitude Praise	High Magnitude Physical	High Magnitude Combo
me	with	yes	three	you	blue	can
look	well	have	play	to	run	go
jump	out	ask	by	again	on	it
little	see	may	good	be	funny	fly
	help	down	new	old	stop	brown
		and	find	big	eat	will
		no	she	under	want	her
		so	round	for	is	
				just		

Note. Random selection of sight words presented to Danny during sessions across conditions.

Table 2*Target list for Richard*

Baseline	Low Magnitude Praise	Low Magnitude Physical	Low Magnitude Combo	High Magnitude Praise	High Magnitude Physical	High Magnitude Combo
5:45	5:10	12:30	3:00	9:05	4:30	12:00
5:30	4:00	10:00	2:30	1:00	7:00	10:45
1:15	6:30	7:05	9:45	9:30	8:40	10:30
	2:00	1:16	10:43	8:35	3:15	12:15
	5:45	1:17	3:18	5:30	12:18	11:00
	3:07	1:45	3:47	2:45	2:56	6:36
	12:45	5:35	2:15		4:50	3:00
	3:45	6:15	6:00		5:15	6:40
	6:05	3:45	4:55		8:30	8:15
	5:55		5:00			7:15
			11:30			

Note. Random selection of times represented by an analog clock presented to Richard during sessions across conditions.

Table 3*Target list for Kevin*

Baseline	Low Magnitude Praise	Low Magnitude Physical	Low Magnitude Combo	High Magnitude Praise	High Magnitude Physical	High Magnitude Combo
Make	A	And	Away	Big	Blue	Can
My	From	Down	Find	For	Funny	Go
Little	Him	Here	I	In	Is	It
Look	Live	One	Play	Red	All	Up
	Over	Did	By	You	Run	Fly
	Help	No	Good	Now	On	Four
	See		Three	To	Ride	Am
	But				Black	
	Come				Two	

Note. Random selection of sight words presented to Kevin during sessions across conditions.

Setting

Experimental sessions occurred in the same location that each participant receives ABA services. The Autism Center consists of individual session rooms, a large common room, and a snack room. Each session room contains a table, chairs, materials required for tasks and reinforcers specific to the client and therapist using the room. Experimental sessions occurred in the session room, as this provided a familiar environment for each participant, as well as control over extraneous variables. Research sessions were conducted prior to the start of the participant's regularly scheduled therapy sessions or following the end of a regular session.

Dependent Variable and Measurement

The primary dependent variable for this study was the *cumulative number of mastered targets*. The secondary dependent variable was average percentage of independent correct responses per session. During each session, frequency data was collected on independent-correct and prompted-correct responses. An independent-correct response was defined as accurately and independently responding to the demand within 5 s. A prompted-correct response was defined as accurately responding to the demand within 5 s of a corrective verbal prompt delivered by the

experimenter. A target was mastered when independent-correct responses were at least 80% for two consecutive sessions. At the end of each session, all mastered targets were added to the number of previously mastered targets within each condition.

Data was also collected on experimenter behaviors including the accuracy of reinforcer delivery by the experimenter following correct responses. Praise delivery was scored if the experimenter provided a praise-based statement within 5 s of the response. Physical delivery was scored if the experimenter provided physical attention within 5 s of the response. No reinforcer delivery was scored if the experimenter did not provide any type of reinforcer within 5 s of the response. If multiple types of reinforcers were delivered within 5 s of the response, each was scored independently.

Interobserver Agreement and Treatment Integrity

A second observer, a Board Certified Behavior Analyst (BCBA) and graduate student in an applied behavior analysis program who was trained in recording data based on the study procedures, observed and independently collected data for 31% of sessions (Danny), 33% of sessions (Richard), and 32% of sessions (Kevin). Interobserver agreement (IOA) was calculated using a trial-by-trial method. At the end of each session, the number of trials in which both observers agree, meaning they scored the same response, was divided by the total number of trials and multiplied by 100% for the child and experimenter behaviors. The average IOA was 99.6% for Danny, 99.7% for Richard, and 97.6% for Kevin (Table 4).

Table 4*Interobserver Agreement*

Participant	Total Number of Sessions	Total IOA Sessions Observed	Percent of Sessions Observed	Total IOA
Danny	65	20	30.76923077	99.66329966
Richard	76	25	32.89473684	99.73262032
Kevin	72	23	31.94444444	97.61904762

Note. Total number of sessions per client observed by a second observer and IOA data.

Treatment integrity data was calculated using a trial-by-trial method. At the end of each session, the number of trials in which the correct experimenter behavior was scored, meaning correct type of reinforcer or no reinforcer was delivered, was divided by the total number of trials and multiplied by 100%. These data were calculated using the same data collected for reliability purposes by a secondary observer. The average treatment integrity across participants was 98.8% (Table 5).

Table 5*Treatment Integrity*

Participant	Session Number	Phase	Condition	Trials Correct	Trials Incorrect	Percent
R2	44	HM	Pr/Ph Combo	15	0	100
R2	45	HM	Ph	14	1	93.33333333
R2	46	HM	Pr	15	0	100
R2	38	HM	Pr/Ph Combo	15	0	100
R2	39	HM	Pr	15	0	100
R2	40	HM	Ph	15	0	100
R2	62	HM	Pr/Ph Combo	15	0	100
R2	63	HM	Pr	15	0	100
R2	64	HM	Ph	15	0	100
K3	40	HM	Pr/Ph Combo	15	0	100
K3	41	HM	Pr	15	0	100
K3	42	HM	Ph	14	1	93.33333333
K3	43	LM	Ph	15	0	100
K3	44	LM	Pr/Ph Combo	15	0	100
K3	45	LM	Pr	15	0	100
K3	49	LM	Pr	15	0	100
K3	50	LM	Pr/Ph Combo	15	0	100
K3	51	LM	Ph	14	1	93.33333333
				267	270	98.88888889

Note. Treatment integrity scored across a random selection of sessions by a second observer.

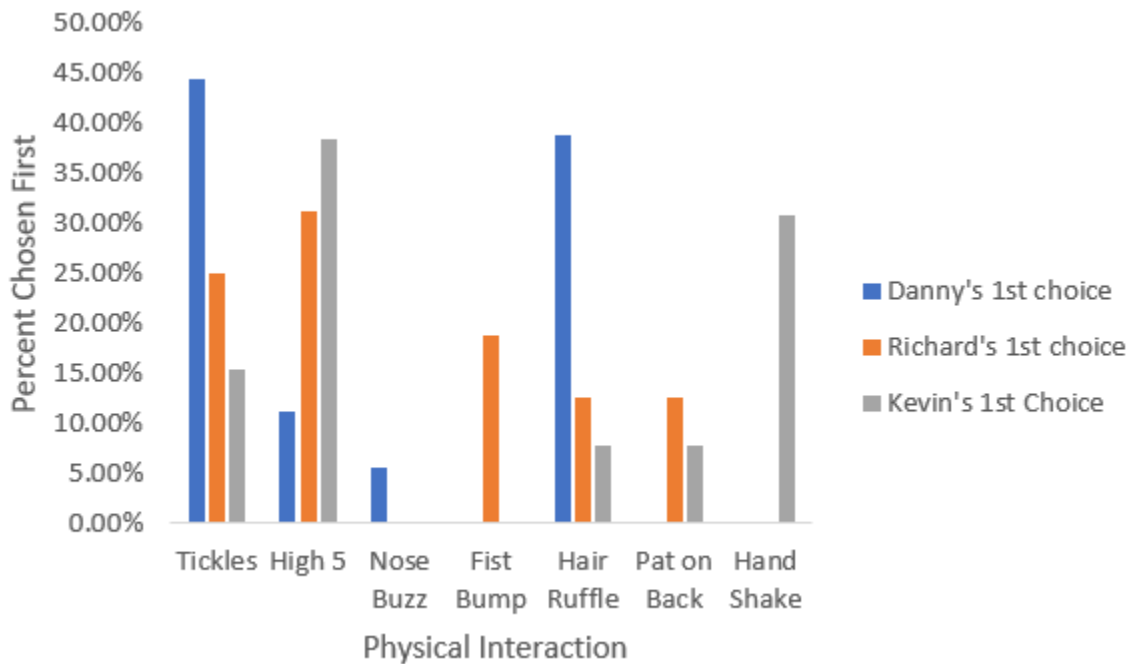
Experimental Design

A concurrent multiple baseline across participants with an embedded multielement design was used to assess the effects of different types of attention and reinforcer magnitude on skill acquisition. A preference assessment for physical attention was conducted using photographs of the experimenter and participant engaging in five different types of physical attention, such as high-fives, tickles, fist bumps, dancing, and hair ruffling. Following the preference assessment,

baseline sessions began across participants. Once steady responding was observed, intervention began. Three conditions were presented during each phase (low and high magnitude) consisting of praise only, physical only, and combination praise and physical.

Preference Assessment

The experimenter conducted an open-ended, informal interview with each participant's parent and behavior technician about interactions the child appears to enjoy. The experimenter then engaged in 5 different social interactions with each participant while an assistant took pictures of the interaction. These pictures were then glued to colored paper to identify the physical condition (Appendix F). The preference assessment was then conducted using procedures similar to the pictorial assessment used by Nuernberger et al. (2012). Pictorial representation of each topography of physical attention was presented using a MSWO procedure. A minimum of five stimuli for physical attention was presented during the preference assessment sessions. The first trial included the presentation of all photographs, and the prompt for the child to "pick one." After the child selected a picture, that type of physical attention was delivered for approximately 3 s. For the next trial, the type of attention that was chosen was removed and the remaining pictures were presented with a prompt to "pick one." This process continued until all pictures were selected. The preference assessment was conducted three times and the rankings were averaged across the assessments for an overall preference hierarchy. The most-preferred type of physical attention was used for the remainder of study 1 (Figure 1).

Figure 1*Preference Assessment Results*

Note. Bar graph showing first choice across participants for physical interactions.

Procedures

Each session began with the identification of whether it was low or high magnitude. The experimenter would state “Low magnitude session begins now” or “High magnitude session begins now”. Each session block began with the presentation of three conditions, attention, physical, and combination attention and physical. The attention picture card shows a photo of the experimenter providing a “thumbs up” to the participant. The physical picture card shows a photo of the experimenter providing physical attention to the participant and was the form of attention identified as the most preferred during the preference assessment. Finally, the third card that represents the combination condition included the same picture used for attention and physical on the same card. The picture cards for each condition were presented and the experimenter instructed the participant to “pick one.” The card chosen represented the first condition of that session block. Once the condition session was complete, meaning each of the 3

targets were presented across 5 trials, the experimenter presented the remaining conditions and again instructed the participant to “pick one.” This process repeated until each of the conditions were implemented. Each magnitude condition always included three targets in acquisition. When a target was mastered, a new target was added such that each condition always had the same number of targets. During each session, each of the three targets was presented five times for a total of 15 trials per condition.

Baseline

During baseline, neutral verbal feedback in the form of “yes” was provided in a neutral tone for each correct response. An incorrect response was followed by a neutral, corrective prompt. A corrective prompt included the experimenter modeling the correct response. If the participant imitated the model, a neutral “yes” was delivered. If the participant did not imitate the model, a new trial began following a 5 s intertrial interval. Each baseline session included 3 targets. The targets were each presented across 5 trials in random order. Baseline was conducted the same across participants. At the end of the session, each independent correct response was added, divided by 5, then multiplied by 100 to determine the percent correct. A minimum of 3 baseline sessions was conducted across participants. If a target was mastered during baseline, the baseline condition continued until a minimum of 3 consecutive sessions resulted in no new mastered targets.

Magnitude Assessments

The condition-specific reinforcers were praise only, physical only, and a combination of praise and physical, each defined below. During the magnitude assessment, the condition-specific reinforcer was provided for each correct response. During the Low Magnitude assessment, each condition-specific reinforcer was provided in small amounts; praise was delivered using one statement, physical attention was delivered for 1-3 s, and for the combination condition praise was delivered using one statement while physical attention was delivered for 1-3

s. During the High Magnitude assessment, each condition-specific reinforcer was provided in larger amounts; praise was delivered using two-three statements and physical attention was delivered for 5-10 s, while the combination condition included both. An incorrect response was followed by a neutral, corrective prompt. A corrective prompt included the experimenter modeling the correct response. If the participant imitated the model, the condition-specific reinforcer was provided. If the participant did not imitate the model, a new trial began following a 5 s intertrial interval.

Praise-only. Praise was defined as a vocal verbal statement delivered in an elevated tone following an independent correct response or prompted correct response. During low magnitude session blocks, one praise statement was delivered which included, “Good job,” “Way to go,” and “You got it.” During high magnitude session blocks, 2-3 statements were delivered such as “That’s right, way to go! You’re so awesome.”

Physical-only. Physical attention was defined as the activity identified during the preference assessment that requires social interaction between the experimenter and participant. No vocal verbal statements were delivered during this condition. Social interaction included activities such as high-fives and tickles. During the low magnitude session blocks, physical activity was delivered for 1-3 s, while during the high magnitude session blocks physical activity was delivered for 5-10 s.

Combination. The combination condition was defined as delivering both praise and physical attention. During the combination session blocks praise and physical attention were delivered as described above for the low and high magnitude sessions.

Study Two - Preference

A concurrent-chains arrangement was used to determine preference across the three conditions presented in both the low and high magnitude session blocks. A MSWO preference

assessment was conducted as the session block continued. Each session consisted of an initial link and a terminal link. At the beginning of the session block, for both low and high magnitude, the participant was presented with a colored picture card representing each condition (initial link). Each colored card was a different color and included a picture of the reinforcer delivered glued in the middle. At the beginning of the initial link, the participant was instructed to “pick one.” Once the participant selected a picture, the terminal link was implemented. During the *terminal link*, the procedures implemented were identical to the procedures from the magnitude assessment in study 1, depending on the condition selected in the initial link. When the condition session concluded, the next initial link was initiated by presenting the remaining colored picture cards and the instruction for the participant to “pick one.” This procedure repeated until an initial and terminal link for each condition was completed. The hierarchy of choices was recorded as well as a cumulative record of the frequency that each condition was chosen first.

Ethical Assurances

Institutional Review Board (IRB) procedures were followed prior to the recruitment of participants. Once approval was granted by The Chicago School of Professional Psychology’s IRB (Appendix H), participant recruitment was conducted using a letter that described the purpose of the study and delivered to parents of children currently receiving ABA therapy. The parents were invited to contact the experimenter with questions or concerns regarding the study, as well as to sign informed consent should they wish to have their child participate. Once consent was obtained, each participant was assigned a unique code for data collection purposes. Each participant was also provided with a unique pseudonym for discussion of results. Throughout the study the sessions were recorded and saved to a password protected drive. Access to the data and session videos was limited to this experimenter, IOA reviewer, and committee chairperson.

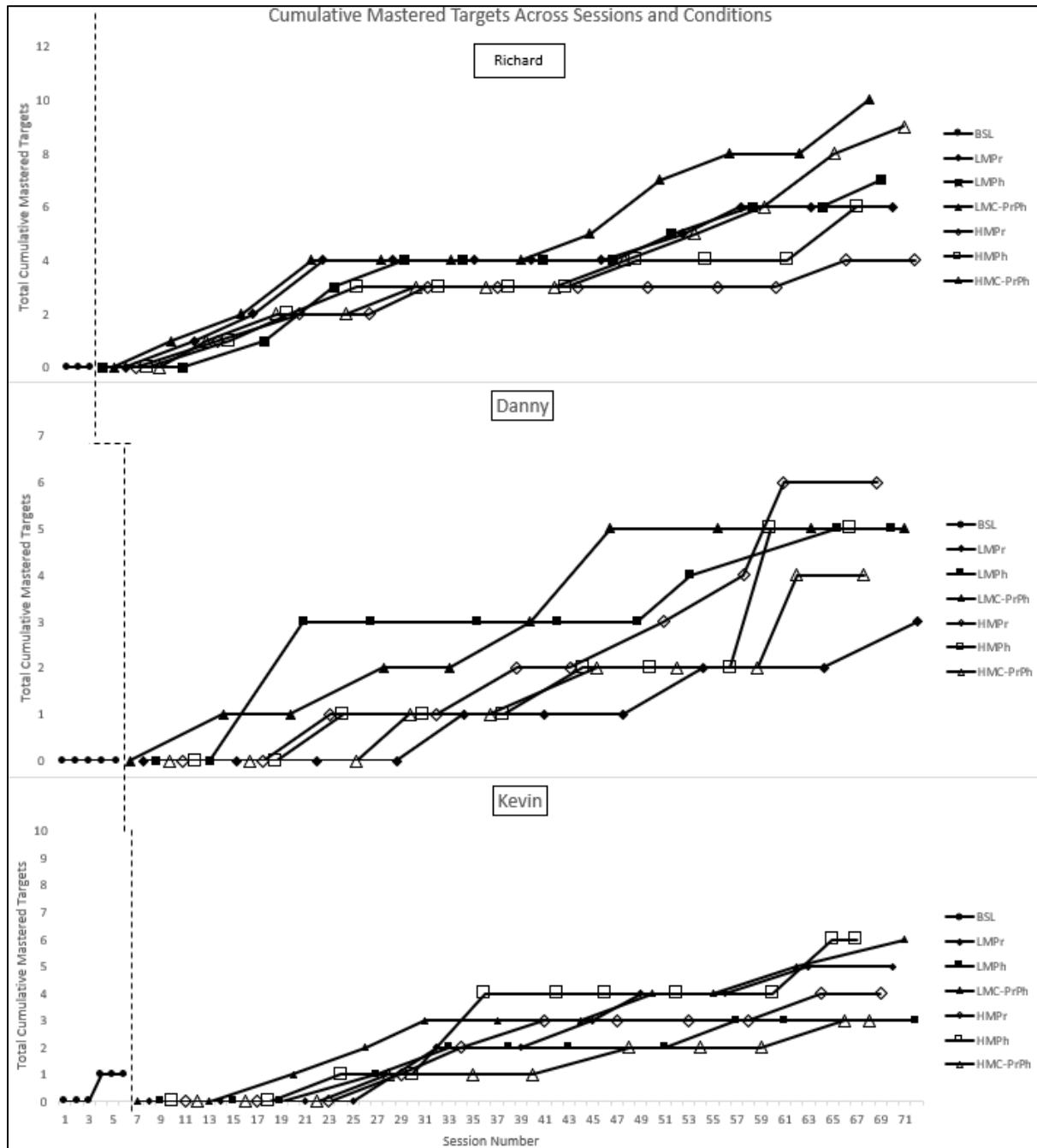
Chapter 4: Findings

Introduction

Results of study one indicates that all three participants mastered targets within their specified program across all conditions. Examination of performance across conditions within the low and high magnitude phases suggest more targets were mastered in the high magnitude phase. Preference for a combination of praise and physical interaction was observed across all participants.

Results

Figure 2 depicts the cumulative number of mastered targets across participants. The top graph depicts the cumulative number of mastered targets for Richard. He participated in a total of 76 sessions. During baseline, there were no targets mastered. Acquisition was variable across conditions. Richard mastered the highest number of targets (10) in the low magnitude praise and physical combination condition, followed by: high magnitude combination (9), low and high magnitude physical only (7), low magnitude praise only (6), and the fewest targets (4) in the high magnitude praise condition.

Figure 2*Cumulative Record of Mastered Targets*

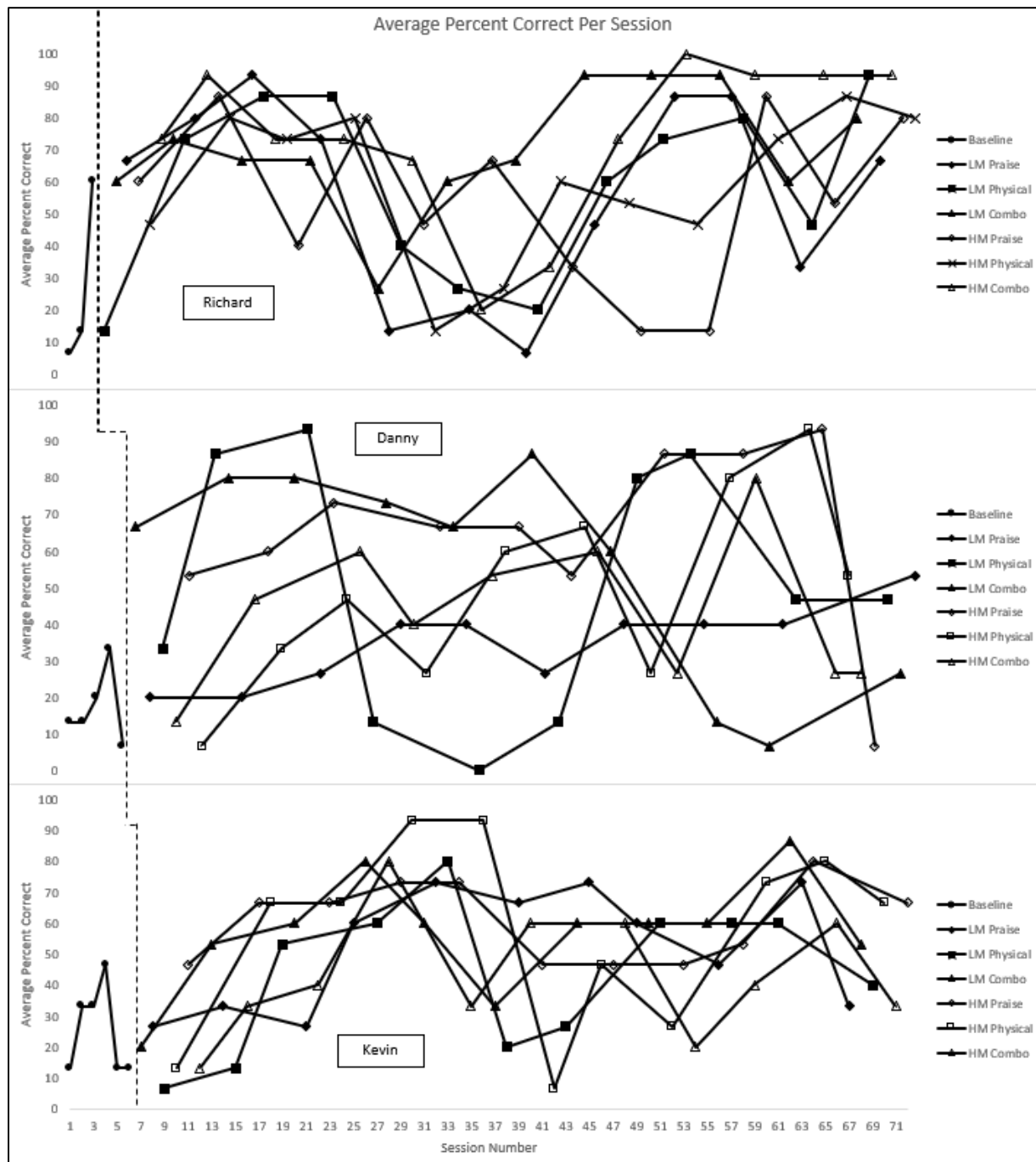
Note. Cumulative record of mastered targets across conditions in both the low and high magnitude phases.

The middle graph depicts the cumulative number of mastered targets for Danny across each condition. He participated in a total of 65 sessions. During baseline, Danny did not master any targets. During the magnitude sessions, there was acquisition across each condition in both

low and high magnitude phases. Danny mastered the greatest number of targets (6) in the high magnitude praise only condition, and the fewest targets (3) in the low magnitude praise only condition. Acquisition in low magnitude, physical only, combination, and high magnitude physical only conditions was the same with 5 each, followed by high magnitude combination (4).

The bottom graph depicts the cumulative number of mastered targets for Kevin across each session. Kevin participated in a total of 72 sessions and mastered 1 target during baseline. He mastered the most targets (6) in both the low magnitude praise and physical combination and the high magnitude physical only conditions. Kevin mastered 5 targets in low magnitude praise only, and 4 targets in high magnitude praise only conditions, followed by the fewest acquired (3) targets in both the high magnitude praise and physical combination condition and low magnitude physical condition.

Figure 3 depicts the average percent correct per session across participants and conditions. In the top graph the data shows a consistent increase followed by decrease then increases again. Both low and high magnitude combination conditions reflect the highest average percentage of correct responses per session. This also correlates with Richard's preferred choice of social reinforcement. The middle graph depicts a slightly different picture, with stable responding in some conditions (low magnitude praise) and highly variable responding in others (low magnitude physical). Finally, the bottom graph depicts data from sessions with Kevin. Each of the conditions begin with a steady upward trend followed by minimal increases with some variability. The data path indicating the condition for low magnitude praise depicts a stable average percent correct across sessions.

Figure 3*Average percent correct across conditions per session*

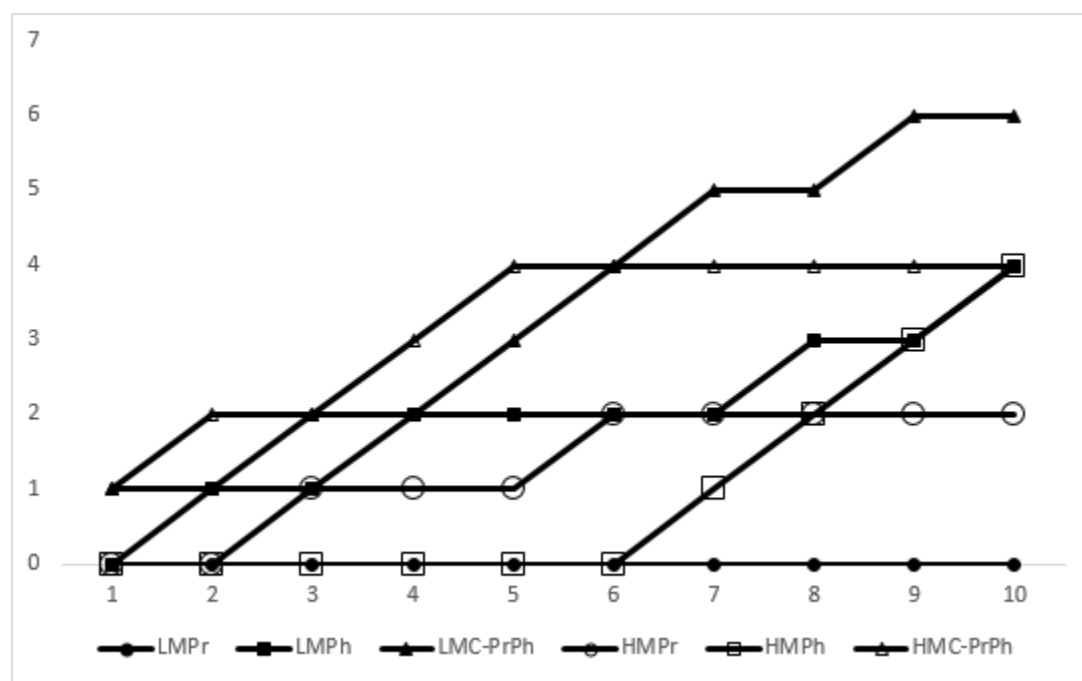
Note. Average percent of independent correct responses per session across conditions.

Preference was assessed throughout the study. A cumulative record of preference for each participant was recorded after each phase. Preference was measured by providing the participant with a choice of each condition and the instruction “pick one”. The first condition

chosen for each phase (low magnitude and high magnitude) was recorded as preferred for that phase. Figure 4 depicts preference across conditions for Danny. He chose praise and physical attention combined the most often (6) during low magnitude phases. During high magnitude phases, Danny's choice tied at 4 each for the combination condition and physical attention condition. Figure 5 depicts Richard's preference, with the most consistent choice pattern in both the low and high magnitude phases being the combination condition (11). Figure 6 depicts Kevin's preference, and like Danny, was variable but low magnitude combination condition ranking highest (5), and a tie at 4 for both high magnitude physical only and combination conditions.

Figure 4

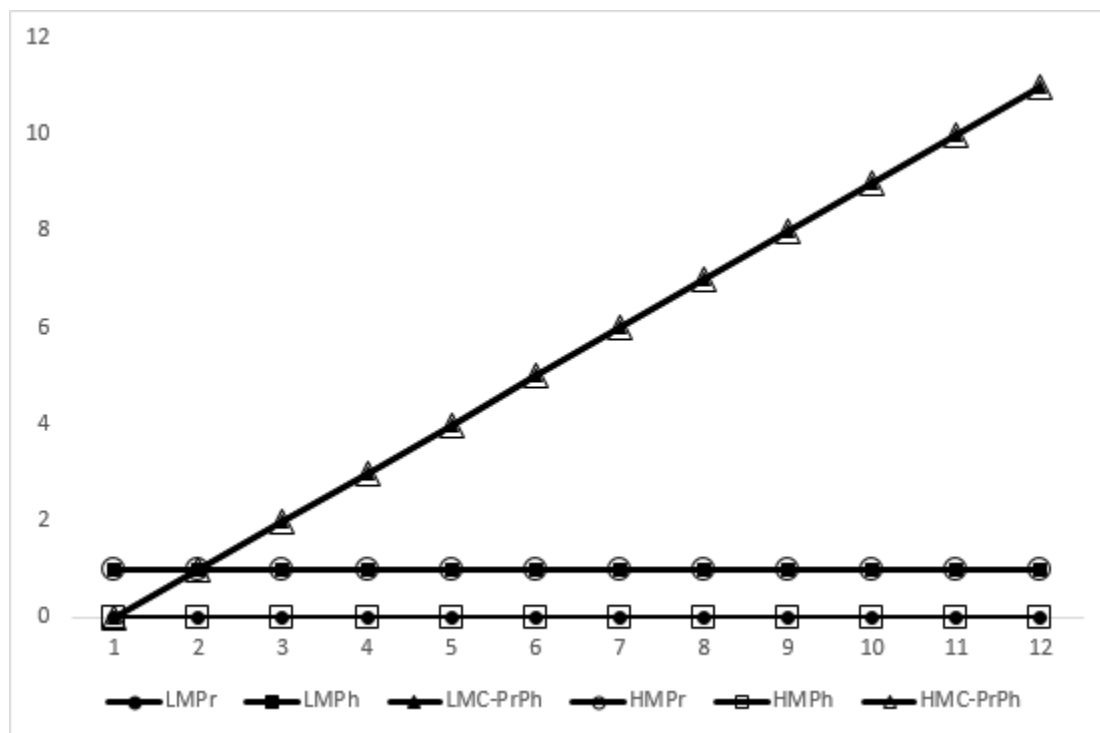
Cumulative Record of 1st Choice Attention Condition for Danny



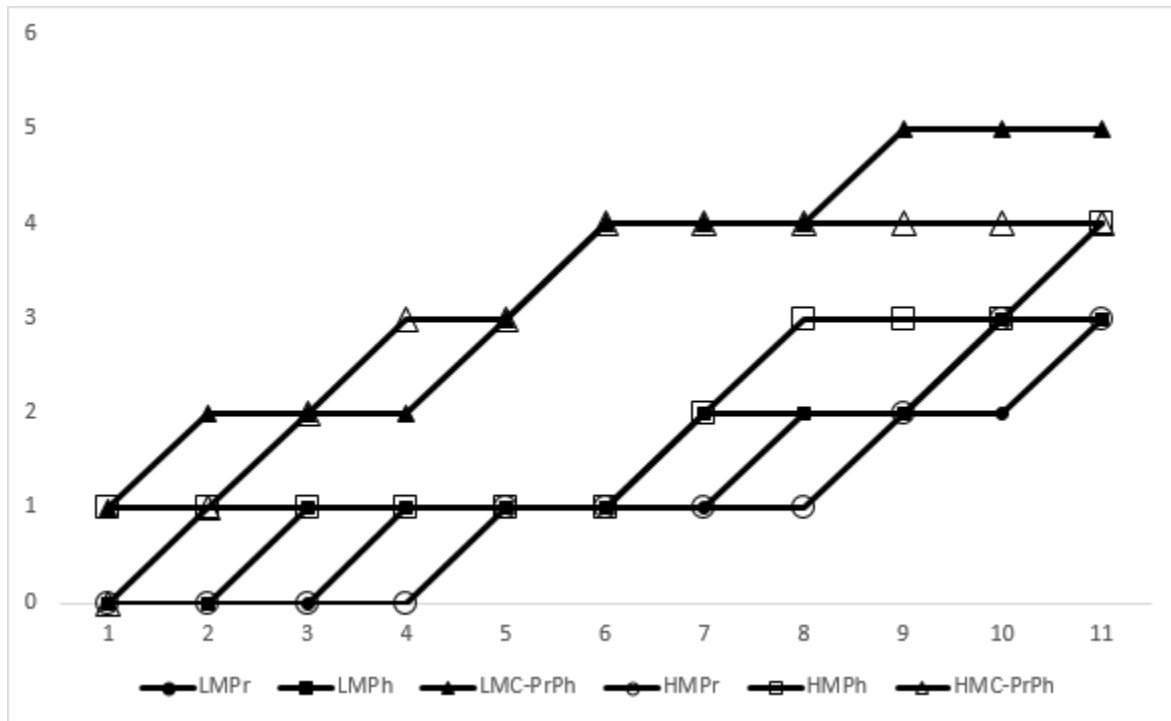
Note. Cumulative record of the first condition chosen at the beginning of each magnitude phase.

Figure 5

Cumulative Record of 1st Choice Attention Condition for Richard



Note. Cumulative record of the first condition chosen at the beginning of each magnitude phase.

Figure 6*Cumulative Record of 1st Choice Attention Condition for Kevin*

Note. Cumulative record of the first condition chosen at the beginning of each magnitude phase.

Chapter Summary

Acquisition of targets was achieved across all conditions for each participant. Richard achieved the highest number of targets in a single condition (10), where both Danny's and Kevin's greatest number achieved was 6. The fewest number of targets mastered across participants in any single condition was 3. Average percent correct was calculated across participants and across sessions. The preferred conditions across each participant also reflect the highest percent correct responses.

Chapter 5: Summary, Conclusions, and Recommendations

Introduction

Social skills are identified as a significant deficit for individuals diagnosed with autism, therefore identifying preferred social interactions is challenging. Multiple studies have addressed this challenge and have delivered results suggesting that social interactions can be effective reinforcement within this population. Clay et al. (2012) were able to assess preference for social interactions using a paired-choice format with five participants diagnosed with autism and other developmental disabilities. Likewise, Nuernberger et al. (2012) assessed whether social interaction could function as a reinforcer and be assessed using a preference assessment. Results from both studies support that social interactions can function as reinforcers. The present study determined a hierarchy of preference for social interactions using a MSWO preference assessment like Nuernberger et al. (2012). The results also indicate social interactions are an effective reinforcer.

Social reinforcers delivered throughout this study were determined by the results of the preference assessment conducted with each participant. Two participants chose high-fives and one participant chose tickles as their preferred social interaction. Magnitude of social reinforcement effects on skill acquisition was evaluated in this study. Three children diagnosed with autism participated, each exhibiting different functioning deficits and skills. Richard displayed higher functioning than Danny and Kevin and therefore the skill taught during this study was telling time on an analog clock. Danny and Kevin both were taught to read sight words identified as pre-school to first grade level. The topography of social reinforcement delivered throughout this study included praise, physical attention, and a combination of praise and physical.

The results of the current study replicate previous results in that skill acquisition was observed across different topographies of social reinforcement (Clay et al., 2013; Nuernberger et

al., 2012; Polick et al., 2012). Each participant acquired mastery of targets across all conditions, with the most achieved in high magnitude combination (Richard), low magnitude praise (Danny), and low magnitude combination (Kevin). Like Paden and Kodak (2015), skill acquisition was observed in the high magnitude phases; however, there was not a significant difference between total acquired targets in the low and high magnitude phases. Each participant was presented with a novel skill with unique targets for each condition. During both low and high magnitude phases, skill acquisition was steady across attention conditions.

Interpretation of Findings

The current study adds to previous findings that social reinforcement can have a great impact on skill acquisition. Results were consistent with Paden and Kodak (2015) in that all participants acquired targets in the praise-only condition; however, this study found that increased acquisition occurred within all conditions presented. Richard and Kevin both acquired the fewest targets within the praise conditions where Danny acquired the most targets within the praise condition.

Multiple studies have evaluated preference of magnitude; however, few have investigated the effects of magnitude on skill acquisition. The current results indicate that magnitude of reinforcement did not appear to have a significant impact on skill acquisition, as the number of acquired targets varied between 1-3. For example, Richard mastered 6 targets in the low magnitude praise condition, and 4 in the high magnitude praise condition. Danny, however, acquired 3 in the low magnitude praise condition and 6 in the high magnitude praise condition. Equal attention, based on the magnitude phase, was delivered upon independent correct and prompted correct responses. This may explain the minimal difference in acquisition between magnitude phases.

Recommendations

Future studies may consider evaluating preference across different magnitude variables. This study did not assess for preference across magnitude, although there was a clear preference for the combination condition in both magnitude phases. Indication of magnitude phase was not prompted at the beginning of sessions. The same colors were used for each condition across magnitude phases, (pink for praise only, orange for combination, yellow for physical only). Additionally, it would be beneficial to further investigate the effects of attention as a reinforcer across multiple skill domains, as well as behavior reduction. It is also recommended that future research include a wider range of participants' age and skill level, as well as diagnoses.

Implications

This study has clinical significance as it demonstrates social reinforcement does positively affect skill acquisition with children diagnosed with autism. Additionally, this study demonstrated the effects of different topographies of attention on skill acquisition across novel skills. Although reinforcement magnitude did not have a significant effect within this study, there is ample research indicating larger magnitude conditions have greater efficacy. It is recommended that additional research is conducted to evaluate reinforcement magnitude and attention within larger populations, as well as with typically developing children and adults.

Conclusion

Attention is accessible at no cost and does not require the use of any materials. Therefore, in settings where edibles are restricted due to allergies, or leisure items are unavailable; attention can be delivered as an effective reinforcer in a variety of behavior reduction and skill acquisition programs.

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Appendix A: Recruitment Letter

Dear Parents/Guardians,

As a part of my doctoral program, I am conducting a research study to examine the effectiveness of differing forms of attention as reinforcement on skill acquisition. I am writing to you today to request your voluntary participation in a research that may potentially increase your child's correct responding during ABA sessions. The study will take place immediately before the start of regularly scheduled ABA sessions for approximately 15 minutes 2-3 times per week, and continue for approximately 10 weeks.

Is your child between ages 4-14?

Does your child have an ASD diagnosis?

Does your child currently receive ABA therapy services?

If you answered "Yes" to each of the above questions, and would like to volunteer to participate in this research, please contact Carrie Gray, Board Certified Behavior Analyst and Doctoral Student at The Chicago School of Professional Psychology via phone or email.

Thank you for your time and consideration in participating in this research. Should you have any questions, please contact either Carrie Gray, BCBA, Doctoral Student; or Julie Ackerlund Brandt, BCBA-D, dissertation chair. Contact information is provided below.

Carrie Gray
906-440-9308
clg3553@ego.thechicagoschool.edu

Julie Ackerlund Brandt
jbrandt@thechicagoschool.edu

Appendix B: Informed Consent

Informed Consent



Investigators: Carrie Gray

Study Title: An Evaluation of the Effects of Reinforcer Magnitude on Skill Acquisition of Children Diagnosed With Autism

Parents/Guardians, I am a doctoral student at The Chicago School of Professional Psychology. This study is being conducted as a part of my *dissertation* requirement for *Applied Behavior Analysis*.

I am asking you to allow your child to participate in a research study. Please take your time to read the information below and feel free to ask any questions before signing this document.

Purpose: The purpose of this research is to test the effects of different types of attention on the total number of new skills learned. The forms of attention being studied are praise only, physical attention only, and a combination of praise and physical attention. Praise consists of verbal statements such as “good job” and “way to go”, and physical attention consists of actions like tickles and high fives.

Procedures: This study will include 3 separate phases that will run over approximately 10 weeks. The first phase will consist of a minimum of 3 sessions, and no more than 6 sessions across 2 weeks. During this phase preference for different forms of praise and physical attention will be assessed. The second phase will then begin, and no instruction or feedback will be provided at this time. I will present each target and record correct or incorrect responses. After a minimum of 3 sessions, the third phase will begin. This phase will include presenting 3 sets of 10 targets, set 1 will receive praise for correct responses, set 2 will receive physical attention for correct responses, and set 3 will receive a combination. As targets are learned, new targets will be introduced. This phase will continue for a minimum of 10 sessions. All sessions will be video recorded for data collection, treatment integrity, and second observer agreement.

Risks to Participation: Risks to your child participant may include increased problem behaviors. Your child’s behavior intervention plan will be reviewed prior to beginning sessions to ensure appropriate preventative and de-escalation procedures are in place.

Benefits to Participants: Your child participant may benefit from the different types of reinforcement presented by increasing their correct responses and increasing their

skill set. Potential benefits also include increased skills learned, increased communication, and additional learning opportunities

Alternatives to Participation: Participation in this study is voluntary. You may withdraw from study participation at any time without any penalty.

Confidentiality: During this study, information will be collected about your child for the purpose of this research. This includes your child's name, age, and gender. All information will be protected by digital password and in a locked box. Identifying information will not be published in the research. Research materials will be kept for a minimum of five years after publication per ABA guidelines.

Your research records may be reviewed by federal agencies whose responsibility is to protect human subjects participating in research, including the Office of Human Research Protections (OHRP) and by representatives from The Chicago School of Professional Psychology Institutional Review Board, a committee that oversees research.

Questions/Concerns: If you have questions related to the procedures described in this document please contact Carrie Gray at clg3553@ego.thechicagoschool.edu or Dr. Julie Ackerlund Brandt at jbrandt@thechicagoschool.edu.

If you have questions concerning your rights in this research study you may contact the Institutional Review Board (IRB), which is concerned with the protection of subjects in research project. You may reach the IRB office Monday-Friday by calling 312.467.2343 or writing: Institutional Review Board, The Chicago School of Professional Psychology, 325 N. Wells, Chicago, Illinois, 60654.

Consent to Participate in Research

Consent to Participate in Research

Parent/Guardian/Legally Authorized Representative:

I have read the above information and have received satisfactory answers to my questions. I understand the research project and the procedures involved have been explained to me. I give my permission for my child/relative/conservatee to participate in this research project. My child/relative/conservatee's participation is voluntary and I do not have to sign this form if I do not want him/her to be part of this research project.

I will receive a copy of this consent form for my records.

Name of Child/Relative/Conservatee Participant (print)

Name of Parent/Guardian/Legally Authorized Representative (print)

Signature of Parent/Guardian/Legally Authorized Representative

Date: _____

Name of the Person Obtaining Consent (print)

Signature of the Person Obtaining Consent

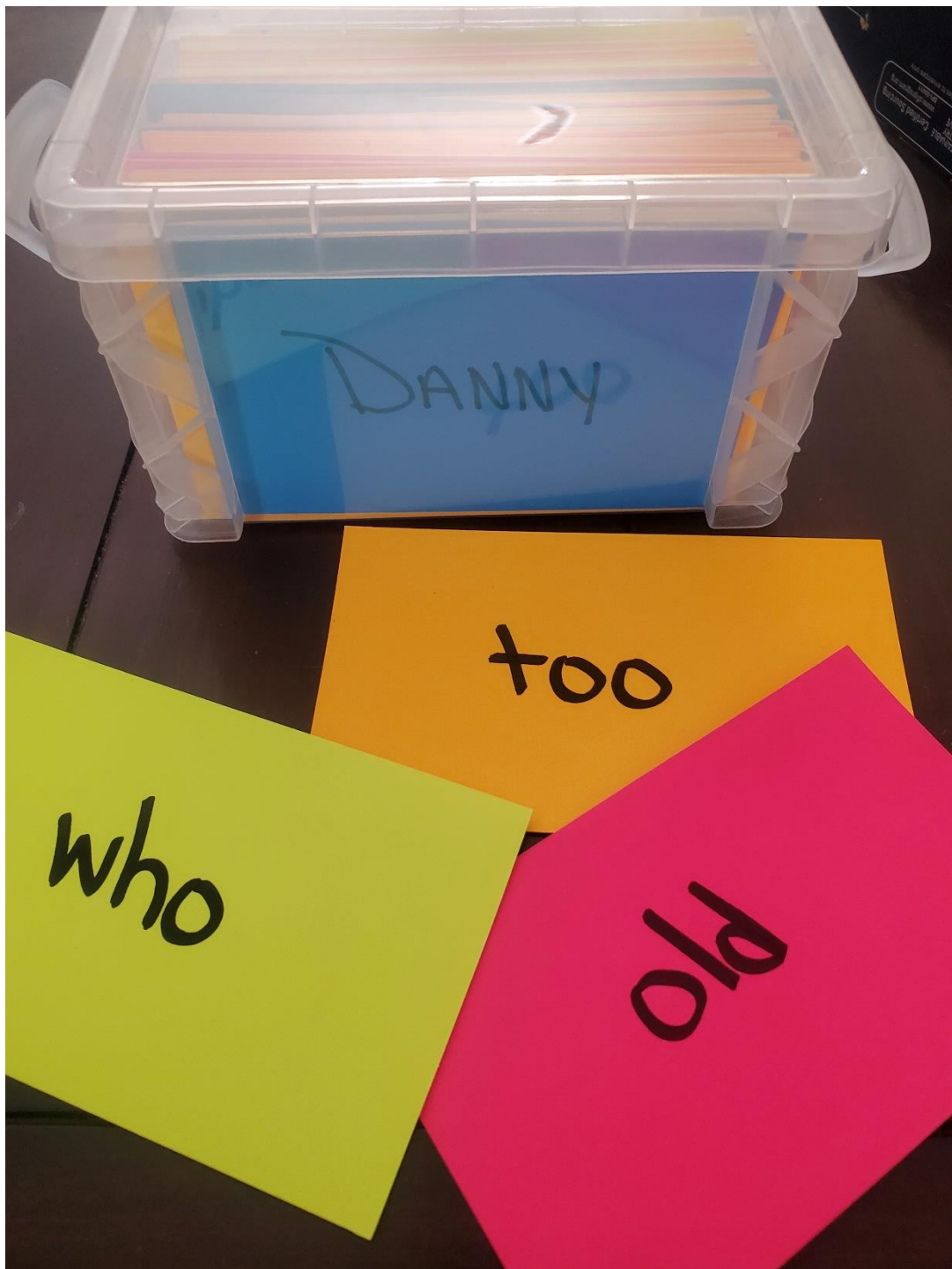
Date: _____

Appendix C: Preference Assessment Interview

1. Please name at least five different verbal statements you say to your child when providing praise.

2. Please name at least five different physical interactions you use to encourage your child.

Appendix D: Index Card Box



Appendix E: Data Sheet

Participant ID: _____

Block Conditions: BL=Baseline (no reinforcement); LM=Low Magnitude (brief); HM=High Magnitude (extended)**Session Conditions:** Pr=Praise; Ph=Physical; C=Combined**Observer Key:** P=Primary data collector; R=Reliability data collector**Data Key:** N=New; C=Correct; I=Incorrect; P=Prompted; M=MasteredDate: _____ Observer: **P R** Session# _____ Block Condition: **BL LM HM** Session Condition: **Pr Ph C**

Session Duration: _____

Target:	1.	2.	3.
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
Total % Correct			

Date: _____ Observer: **P R** Session# _____ Block Condition: **BL LM HM** Session Condition: **Pr Ph C**

Session Duration: _____

Target:	1.	2.	3.
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
Total % Correct			

Date: _____ Observer: **P R** Session# _____ Block Condition: **BL LM HM** Session Condition: **Pr Ph C**

Session Duration: _____

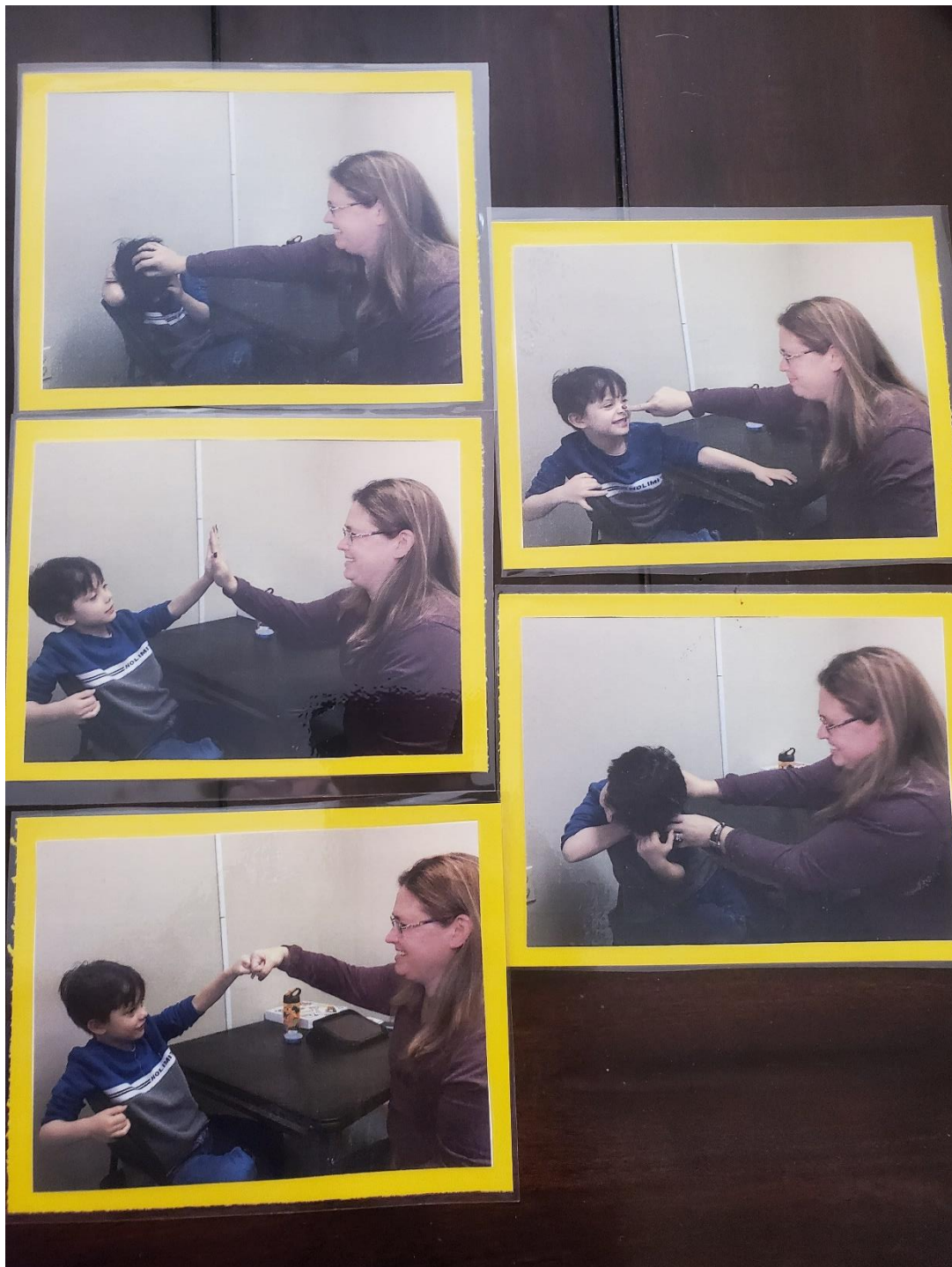
Target:	1.	2.	3.
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
Total % Correct			

Date: _____ Observer: **P R** Session# _____ Block Condition: **BL LM HM** Session Condition: **Pr Ph C**

Session Duration: _____

Target:	1.	2.	3.
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
N M	C I P	C I P	C I P
Total % Correct			

Appendix F: Physical Attention Photo Cards



Appendix G: Condition Photo Cards



Appendix H: IRB Approval**INSTITUTIONAL REVIEW BOARD****Expedited Approval**

08-Jan-2019

IRB # : IRB-18-07-0042

Study Title : An Evaluation of the Effects of Reinforcer Magnitude on Skill
Acquisition of Children Diagnosed With Autism

Principal Investigator: Gray, Carrie

Study Team : Gray,

Carrie~Brandt, Julie~

Expiration Date : 07-Jan-
2020

Dear Investigator,

This notification certifies that the above referenced study has been reviewed by The Chicago School of Professional Psychology IRB. The committee has determined that the study meets the requirements for approval by expedited review under category 6, 7.

Collection of data from voice, video, digital, or image recordings made for research purposes.

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Documents approved for use include informed consent document(s) and advertising material.

Please note that investigators and study personnel must comply with all applicable Federal, State, and local laws regarding the protection of human subjects in research, as well as all

TCSPP policies and procedures. This includes, but is not limited to, the following:

- **Conducting Research:** Ensuring that the research is conducted according to the IRB approved research protocol. Investigators are responsible for the actions of all co-investigators and research staff involved with this research as well as the confidentiality of data. Research may only be conducted using the IRB approved documents included with this approval notice.
- **Modifications:** Proposed changes to this study or related documents must be submitted to the IRB via an *Addendum Application*. All changes must be reviewed and approved by the IRB prior to implementation. Failure to obtain prior approval could result in suspension of the study and additional action as necessary.
- **Continuing Renewal:** Submission of a *Continuing Renewal Application* and any corresponding documents at least 30 days prior to study expiration to prevent a lapse in IRB approval.

- **Unanticipated Problems and Study Deviations:** Timely and accurate reporting of all study unanticipated problems. An unanticipated problem is any problem or event which was unanticipated, reflects new or increased risk to the subjects and was possibly related to the research procedures. Study Deviation is any change in the study plan that was not previously approved by the IRB Committee.)
- **Recordkeeping:** Accurate record keeping of all study related documents, correspondence, and files.

In addition, all researchers are required to always follow the American Psychological Association's ethical principles and code of conduct, especially in regards to Section 8 of the ethical code ("research and publication"). Failure to conform to the APA ethical code may result in revocation of IRB approval.

Please keep this notification in your study records. You may contact the IRB office with any questions or concerns via the department mailbox IRB@TheChicagoSchool.edu.