An Evaluation of the Consistency and Accuracy of Children Preferences for and Reinforcing Efficacy of Different Types of Attention Across Different Adults

Tiva Pierce

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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Abstract

Attention has been used as a sort-of “catch-all” term often in behavior-analytic research to describe social interactions between two individuals (Allen, Hart, Buell, Harris, & Wolf, 1964). Previous researchers have also demonstrated that different topographies of attention (i.e., eye contact, praise, physical, conversation, and reprimands) affect an individual's responding differentially (e.g., Fisher, Piazza, & Chiang, 1996), and some types of attention (i.e., praise, physical attention, and conversation) are more preferred and/or reinforcing than other types of attention (e.g., Clay, Samaha, Bloom, Bogoev, & Boyle, 2013). However, in the current literature, the therapist or researcher has remained constant, and it is possible that the different ways in which attention is delivered may affect preference hierarchies and reinforcing efficacies. Therefore, the purpose of the current study is to determine if different types of attention are consistently preferred across different adults and if those preferences are consistent with the reinforcing efficacies both within and across adults. Results showed in general, different types of attention do act as reinforcers. This has been shown in previous research and is shown in the results of the current study. These results include some conflicting conclusions as compared to previous research; however, these differences will hopefully lead to some additional research and more information about how to effectively use attention – in isolation – as reinforcers instead of as package with other tangible items such as edible or leisure items.

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Chapter 1: Nature of the Study

Background

Attention has been used as a sort-of "catch-all" term often in behavior-analytic research to describe social interactions between two individuals (Allen, Hart, Buell, Harris, & Wolf, 1964; DiCarlo & Reid, 2004; Duffy & Nietupski, 1985; Gable & Shores, 1980; McLaughlin, 1982; Poulson, 1983; Schutte & Hopkins, 1970). When authors write about "attention," they may be referencing vocal-verbal interactions (e.g., praise, conversations, reprimands), physical contact between two individuals (e.g., hugs, pats on the back), or even changes in facial expressions (e.g., smiles, winks, frowns).

There has been much previous research demonstrating the reinforcing effects of attention for increasing desirable behavior (e.g., Gable & Shores, 1980; McLaughlin, 1982), as well as undesirable behavior (e.g., Fisher, Ninness, Piazza, & Owen-DeSchryver, 1996; Kodak, Northup, & Kelly, 2007; Lovaas & Simmons, 1969; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) in many populations across settings. Previous researchers have also demonstrated that different topographies of attention (i.e., eye contact, praise, physical, conversation, and reprimands) affect an individual's responding differentially (e.g., Fisher, Ninness, Piazza, & Owen-DeSchryver, 1996; Kodak et al., 2007), and some types of attention (i.e., praise, physical attention, and conversation) are more preferred and/or reinforcing than other types of attention (e.g., Clay et al., 2013; Harper, 2014; Nuernberger, Smith, Czapar, & Klatt, 2012). However, in the current literature, the therapist or researcher has remained constant, and it is possible that the different ways in which attention is delivered may affect preference hierarchies and reinforcing efficacies. Therefore, the purpose of the current study is to determine if different types of

attention are consistently preferred across different adults and if those preferences are consistent with the reinforcing efficacies both within and across adults.

Definition of Key Terms

Concurrent-chain arrangement. A concurrent chains arrangement includes an initial and terminal link. In the initial link, the types of attention are presented to the child and she is prompted to select one. Then, the terminal link includes either a trial or session being conducted in which that type of attention is accessed for working on the task presented (Harper, 2014).

Concurrent operant arrangement. Include two or more set of materials, which are often color coordinated and associated with different types of attention. In this example, working on the blue work sheet would result in praise and working on the orange worksheet would result in physical attention (Harper, 2014).

Conversation. 7-10 s of verbal exchanges with the participant on a topic of interest to theparticipant such as computer games, and preferred items

Paired stimulus preference assessment. Using this procedure, two pictures of the therapist and child engaging in two types of attention are presented and the child is prompted to choose his favorite (Harper, 2014).

Physical Attention. Physical interaction such as tickles, high fives, squeezes

Praise. Single positive verbal statement such as good job, great work.

Single operant arrangement preference assessment. One set of task materials which result in one type of attention. The rate of responding during a session will be indicative of the absolute reinforcing efficacy of that type of attention (Harper, 2014).

Single-stimulus preference assessment. Is conducted where a picture of the child and therapist engaging in the type of attention is presented to the child. If the child touches it or

engages with it in some appropriate manner such as saying yes or nodding their head, the therapist will engage in that type of attention (Harper, 2014).

Chapter 2: Review of the Literature

Preference Assessments

Systematic procedures used to determine preferred items and/or activities are commonly called "stimulus preference assessments" (SPAs). Previous researchers have provided ample evidence that the items or activities deemed to be highly preferred during SPAs often function as reinforcers as well (Fisher, Piazza, & Chiang, 1996; DeLeon, Iwata & Goh, 1997; Piazza, Fisher, Hagopian, Bowman, & Toole, 1996; Roscoe, Iwata, & Goh, 1998). SPAs should be included as a routine procedure of any child's teaching or clinical program and they should be repeatedly conducted because preferences for items can shift over time (Carr, Nicolson, & Higbee, 2000). Since their beginning in the late 1980s, SPAs have commonly been used to evaluate the relative preference of edibles (e.g., Fisher et al., 1992; Fisher, Piazza, & Chiang, 1996; DeLeon et al., 1996; Northup, George, Jones, Broussard, & Vollmer, 1996), toys and leisure items, (e.g., DeLeon et al., 1996; Fisher et al., 1992; Fisher, Piazza, & Chiang, 1996; Northup et al., 1996; Pace et al., 1985; Paclawskyj & Vollmer, 1995), vocational tasks (Lattimore, Parsons, & Reid, 2002; Reid, Parsons, & Green, 1998; Worsdell, Iwata, & Wallace, 2002), and activities (Hanley, Iwata, & Lindberg, 1999; Hanley, Tiger, Ingvarsson, & Cammilleri, 2009); however, in recent years, SPAs have also been used to evaluate different types of attention (Clay et al., 2013; Clay, Samaha, & Bogoev, 2018; Nuernberger et al., 2012).

Stimulus Preference Assessments

There are various methods that may be used to conduct an SPA. Many of the common SPAs, including the paired-stimulus (Fisher et al., 1992), multiple-stimulus (DeLeon et al., 1996; Windsor, Piché, & Locke, 1994), and free-operant assessments, involve a concurrent-operants arrangement, meaning there is the simultaneous presentation of more than one stimulus, and the

student or client can choose between the two and a preference hierarchy can be developed which depicts the relative preferences of the various stimuli.

SPAs are useful for evaluating preferences; however, they do not directly assess whether a stimulus will function as a reinforcer. It is possible that the preference hierarchy developed from a preference assessment may not directly match the reinforcing efficacy of the items; in fact, previous studies have shown that it is possible for high-preferred stimuli not to function as reinforcers (Higbee, Carr, & Harrison, 2000) and low-preferred stimuli to function as reinforcers (Roscoe, Iwata, & Kahng, 1999). Because these instances may happen more than we expect, reinforcer assessments are recommended to validate the results of SPAs. Reinforcer assessment methods involve presenting a stimulus following the occurrence of a behavior and determining whether responding increases in comparison to baseline responding levels.

Reinforcer Assessments. Similar to preference assessment methodologies, there are several various methodologies used when conducting reinforcer assessments, Two common differences include single-operant arrangements (e.g., DeLeon et al., 1996; Paclawskyj & Vollmer, 1995; Roscoe et al., 1999) vs. concurrent-operants arrangements (e.g., Fisher et al., 1992; Piazza et al., 1996; Roscoe et al., 1999). In a single-operant arrangement, one stimulus is presented contingent upon the target response; whereas, in a concurrent-operants reinforcer assessment, two or more stimuli available. Because the stimuli are concurrently available, the concurrent-operants reinforcer assessment assesses the relative reinforcing efficacy between the available alternatives, similar to a paired-stimulus preference assessment. Also similar to SPAs, reinforcer assessment research has commonly been conducted with tangible stimuli such as edible or leisure items; however, recently researchers have begun to use these methods to evaluate some types of attention as well. Typically, these are types of physical attention, but it is

possible to apply these methods to other types of attention, such as praise and conversation, because many variations of attention have been shown to act as a reinforcer under functional analyses.

Functional Analysis methodology (Iwata et al., 1982/1994) has allowed behavior analysts to determine the function of problem behavior and develop more effective treatments based on those analyses. Functional analysis researchers have repeatedly shown that various problem behaviors including self-injurious behavior (SIB; Iwata et al., 1982/1994; Lovaas & Simmons, 1969), aggression (Roscoe, Kindle, & Pence, 2010), and bizarre vocalizations (DeLeon, Arnold, Rodriguez-Catter, & Uy, 2003; Wilder, Masuda, Baham, & Conner, 2002) may be maintained by contingent attention. Beavers, Iwata, and Lerman (2013) evaluated the outcomes across functional analyses published in behavioral journals until 2012. Their compilation revealed that social-positive reinforcement was the maintaining variable for 29.2% of the published cases. Additionally, Kurtz, Chin, and Tarbox (2003) evaluated SIB of 30 children under 5 years of age and found that social-positive reinforcement in the form of attention, tangibles, or both were the maintaining variable for 37.9% of the cases. This increased likelihood of attention as a reinforcer for problem behavior may indicate that attention is more valuable for young children as compared to adults.

McKerchar and Thompson (2004) also showed that attention was the most common consequence for problem behavior (self-injury, aggression, and disruption) in 14 typically developing preschool-aged children. They collected data on the occurrence of antecedent events, child's behavior and the teacher's responses. They found that attention was the most common classroom consequence for 100% of the children, followed by material presentation (79% of the children), and escape from instructional task (33%). They also compared probabilities of

teacher's responses, they found attention increased subsequent to the occurrence of problem behavior. They suggested that a contingency exist between these two events.

Fisher, Piazza, and Chiang (1996) evaluated the content of verbal attention with a child who engaged in attention-maintained problem behavior. In this study, they made a comparison of verbal statements related to (don't kick me) and unrelated to the behavior (today is sunny). Two attention conditions were conducted, using a multielement design, to determine whether the content of verbal attention was important to its reinforcing effect on destructive behavior. They also used a different therapist paired with each condition, to control for therapist effect. Their results suggest that verbal statements that were related to destructive behavior, were higher quality reinforcers for destructive behavior, than statements that were unrelated to participant's behavior. They found higher rates of problem behaviors occurred when statements were related to the problem behavior.

Kodak et al. (2007) conducted a standard functional analysis (FA) and when they found that two participants had problem behavior maintained by attention, they followed up with a modified assessment in which they compared six topographies of attention: reprimand, eye contract, tickles, unrelated comments, praise, and physical attention. Both of their participants showed differentiated levels of responding to specific types of attention. One participant responded most when reprimands were delivered, and the other responded the most when reprimands or unrelated comments were delivered. This is interesting because there are many topographies of attention that may have been delivered, including statements of concern or explanations of reason why not to engage in that behavior, that would not have functioned as reinforcers. However, this study did not examine the mechanism behind why one topography of attention is more reinforcing than another. The authors made a strong argument for collecting

indirect and direct observation data when conducting an FA, in order ensure the type of attention delivered is the same as what is delivered in the natural environment; however, there needs to be more research on the development of these types of attention as reinforcers for problem behavior.

Piazza et al. (1999) suggested that certain forms of attention may have a historical relation with problem behavior, and other forms of attention may have a historical relation with appropriate behavior. They found that verbal reprimands functioned as reinforcers for appropriate and problem behavior. However, they found praise didn't function as a reinforcer for appropriate behavior when the delivery of verbal reprimands was available. They proposed that these results might have been due to an individual's history of being provided verbal reprimands for problem behavior.

LeBlanc, Hagopian, Marhefka, and Wilke (2001) assessed the effects of different forms of attention (physical versus verbal attention) on attention-maintained aggression, displayed by an 11-year-old girl with intellectual disabilities. This study was conducted with the use of multiple phases; in phase one they conducted a functional analysis. During the social attention condition, the girl was given leisure items and instructed to play with them quietly while a nearby adult was busy with a task. The adult provided attention in the form of a verbal reprimand if any destructive behavior occurred. In the demand condition the girl was instructed to complete a series of pre-academic and self-care tasks using a three-step prompting procedure. The therapist removed the task material and ended the instructional sequence for 30 seconds if any destructive behavior occurred. During the tangible condition, the girl was allowed access to preferred toys for two minutes prior to the session. The toys were removed and only brought back for 30 seconds contingent on destructive behavior. Phase two was an analysis of therapist

gender and type of attention. Two conditions of continuous non-contingent attention, verbal attention, and verbal and physical attention were compared in a reversal design, They found that problem behavior decreased under both attention conditions; however, lower rates of problem behavior occurred when verbal attention plus physical attention was delivered, when compared to verbal attention alone. They found there was an interaction effect between the two variables, with type of attention having a greater impact on the difference between conditions for males than for females. In addition to positive reinforcement on inappropriate behavior there has been numerous studies on positive reinforcement on appropriate behavior.

Nuernberger et al. (2012) also evaluated various types of attention within a preference assessment and a reinforcer assessment. They used different types of physical interactions (i.e., tickles, spin, & swing) in a Multiple Stimulus Without Replacement (MSWO) preference assessment and afterwards evaluated whether high-ranking types functioned as reinforcers for children with autism. Similarly, Clay et al. (2018) also assessed preferences using a paired choice style preference assessment for different types of social interactions (i.e., thumbs up, high five, & head rubs) using preference and reinforcer assessments. Both studies were able to show that participants displayed preferences for certain types of social interactions, and these preferences corresponded to the levels of responding in the reinforcer assessments. This may indicate that children with autism have distinct preferences for certain types of attention interactions, at least those which are physical in nature. This also speaks to the idea that different types of physical attention may be more or less reinforcing based on the individual who is engaging in that interaction with the student or client.

For example, Clay et al. (2013) examined five individuals with intellectual and developmental disabilities. They used a paired-choice procedure to access preference for social

interactions across five individuals. They identified four forms of attention, each form of attention included social interaction and physical contact. They used a three-phase process for identifying preferred reinforcing forms of social interaction. In the first phase, a paired-choice preference assessment was used to identify a hierarchy of preferred social interaction. They conducted a subsequent tracking test which provided evidence that participants' approach was under the control of social interaction delivered, as opposed to idiosyncratic features of the therapist. The third phase demonstrated that the participants' preference for the forms of social interactions, functioned as reinforcers for all five participants. Their results verified previous research, which identified that a paired choice format successfully led to identification of a preference hierarchy. Their results indicated that all five participants identified a social interaction that functioned as a reinforcer.

Clay et al. (2018) furthered this research by assessing preference for, and reinforcing the efficacy of components of social interaction, in two individuals with autism. This was done by comparing individual components (edible, vocal and physical interaction) alone and in combination with each other. They first conducted a preference assessment within three stimulus classes; edible, vocal interaction and physical interaction, to develop a hierarchy. They then evaluated preference for individual stimuli across these classes. They followed the preference assessment by evaluating the effectiveness of relative reinforcing. The last assessment they conducted involved the individuals who had physical and vocal stimuli as a reinforcer. They evaluated if adding another component to the reinforcer increased the effectiveness of that consequence of a reinforcer. The results of the study suggested differences in relative reinforcing efficacy of social interaction. Nuernberger et al. (2012), similar to Clay et al. (2018), assessed various types of physical interactions (tickles, spin and swing), in a MSWO preference

assessment, and evaluated whether they functioned as reinforcers for children with autism. Both studies were able to show that participants displayed a preference for certain types of social interactions, and these preferences corresponded to the levels of response in the reinforcer assessments.

Researchers have evaluated attentions, and variation of it, as components of treatment for many years. For example, Clements and Tracy (1977) compared the effects of physical attention across multiple conditions; physical attention, physical attention and praise, praise only, on on-task behavior. They studied ten boys aged from 9 to 11 years old. The teacher initiated each treatment by giving the students an arithmetic work sheet, instructing them to work on the sheet. The teacher would deliver tactile cue (press on shoulders) and a verbal cue (good job) every 4 minutes during a 20-minute work session. Results showed that on-task behavior was higher when physical attention was combined with praise, compared to praise alone.

Much research has been presented on the preference for and reinforcing efficacy of different types of attention; both in assessments and treatments. However, there is not an abundance of research evaluating why one type of attention may be preferred over another. Fisher, Piazza, and Chiang (1996) conducted phases using different therapists to determine if verbal reprimands had a greater reinforcing efficacy when the participant's original therapist delivered them as compared to the therapist conducting the assessments. As attention may be delivered in different manners by different individuals, it may be understandable that the individual providing the attention may have an effect of the preference for and reinforcing efficacy of that attention. Additionally, the attention delivered by an adult may affect the rapport and relationship developed between them and their clients or students.

Few researchers have used preference assessments with staff members as stimuli, which would test the reinforcing efficiency across different staff members (Sturmey, Lee, Reyer, & Robek, 2003); however, some researchers have started to investigate some of the characteristics and factors that may influence the efficacy of attention as a reinforcer. Sturmey et al. (2003) assessed preferences for specific staff by modifying a paired-stimulus assessment. They studied four adults with intellectual disabilities, two children with autism, and one emotionally disturbed child. They modified the assessment by presented each participant with a pair of staff members to choose, while the experimenter recorded the percentage of approach responses. Before the assessment each staff person interacted one at a time with the participant for 30 seconds. Five of the seven participants showed a preference for at least one staff. The results also provided preliminary support for the use of a paired-stimulus method to empirically identify consumer preferences for different staff personnel.

Many researchers have shown the efficacy of different topographies of attention for problem behavior (Fisher, Piazza, & Chiang, 1996; Kodak et al., 2007) and appropriate behavior (Clay et al., 2013; Clay et al., 2018; Nuernberger et al., 2012). However, in the majority of these studies, the therapist was kept constant, which may have affected the preference for and efficacy of attention. The purposes to the current study are to replicate and extend previous research on various topographies of attention across multiple adults to determine if attention preferences are consistent or if they vary across adults.

Chapter 3: Research Design and Method

Research Design

Participants

Participants included two typically developing boys (Andrew and Brady), and one boy diagnosed with ASD (Christopher) recruited from a local school district. Andrew and Brady are 11-year-old identical twins that receive social group intervention with other students who have siblings on the Autism Spectrum. Christopher is Andrew and Brady's older brother; he is 13 years old. Christopher receives Applied Behavior Analysis (ABA**)** services with Constellation for Registered Behavior Technician (RBT) and Board Certified Behavior Analysts (BCBAs) consult within the school district. Christopher recently had a VBMAPP conducted to better understand his current skill level; his score was in the level two range. All three therapists are outside contractors for the district and have a rapport with all participants.

The only difference of exposure of therapist is Christopher sees Raymond his RBT for seven hours a day five days a week. Brady and Andrew have had preference assessments either during social group work to assure that attention is a reinforcer. Christopher's FBA assured that attention was a reinforcer maintaining problem behaviors. The research team included two BCBAs, Connie and Tina, and one RBT, Raymond.

Materials

Materials included three pictures, each depicting a type of attention (i.e., praise, physical attention, and conversation) which were used as discriminative stimuli to denote the type of attention which would be delivered. There were three sets of pictures per participant, one set per researcher so that the picture used was depicting the researcher and participant and not another adult who may deliver that type of attention differently. Pictures were taken before the study

began and pasted on a different colored background to help distinguish between attention conditions.

The task materials for Andrew and Brady included math worksheets. Each worksheet had 20, previously mastered math problems and multiple worksheets were available in each session so the participants could work the entire time, if they wanted. Andrew and Brady's teacher was consulted to see if the math problems that were collected were mastered material. The task materials for Christopher included colored plastic bears which were sorted into different colored bins. Enough of the bears were provided such that he could sort throughout the session, if he wanted. Christopher's special education teacher was consulted on sorting material and felt if Christopher needed to do a lot of trials it would be best to make it a preferred task like sorting.

Setting

Sessions occurred in a designated secluded area within their classroom at school or at their home. The area included a table and two chairs. Sessions were conducted 2-5 times a day 3-5 days a week, and breaks were provided every 10 minutes.

Dependent Variable and Measurement

Data were collected electronically using the app Countee on a researcher's smartphone. The primary dependent variable during the preference assessment sessions was the frequency of selection of each picture depicting each type of attention (praise, physical, and conversation). A *selection* was defined as placing his hand on or pointing to one of the pictures presented. At the end of the session, the number of selections were divided by the total number of presentations and multiplied by 100% for each type of attention to create the preference assessment hierarchies.

Data during the reinforcer assessment sessions were collected on the rate of correct and incorrect responses, and the type and duration of attention delivery during the reinforcer assessment sessions. A *correct response* was defined as accurately sorting the shape depicted on a card with the corresponding box. An *incorrect response* was defined as inaccurately sorting the shape depicted on a card with a non-corresponding box. At the end of each session, the duration in which a type of attention was delivered will be subtracted from the overall time to account for differences in consumption of praise vs. physical attention vs. conversation. Data were also collected on the frequency of delivery of each of type attention and the duration in which it was delivered. *Praise* was defined as a statement of encouragement referring to the participant's response ("Way to go", "Good work"). *Physical Attention* was defined as a physical interaction between the clinician and the participant (i.e., tickle, hugs, pat on the back) without vocal interaction. *Conversation* was defined as a vocal exchange between the clinician and participant about a topic selected by the participant (e.g., "Favorite superhero, favorite princesses, toys, etc".) last approximate 7-10 s. At the end of each session, the duration in which each type of attention was delivered was subtracted from the original session duration. After the consumption time for each type of attention is subtracted, the number of correct responses was divided by the new session duration to determine the rate of responding.

Interobserver Agreement and Treatment Integrity

Interobserver agreement was assessed by having a second observer independently collect data on child and therapist behavior for an average of 100% of sessions across participants. Observers' records were divided into 10 second intervals and compared on an interval by interval basis. Interobserver agreement was calculated by dividing the smaller number of responses by the larger number of responses recorded in each interval, summing these quotients, dividing this

number by the total number intervals and converting this ratio to a percent. For Andrew, mean IOA was 98% (range: 83-100%). For Brady, mean IOA was 97% (range: 82-100%). For Christopher, mean IOA was 98% (range: 83-100%).

Treatment integrity (Figure 1) was assessed by having the same second observer independently collect data based on the treatment integrity check list. The check list contained step by step instructions of what should be said or delivered during the sessions with the student. Answers were either scored as yes or no for occurring during the sessions. Treatment integrity was calculated for an average of 30% of the sessions. The second observer collected data on the behavior of the primary researcher during the trails and their responses to the participants behavior. Treatment integrity was calculated by dividing the number of trails in which the correct treatment steps were provided by the total number of steps and multiplied by 100%. Treatment integrity was 100% across all three participants.

Treatment Integrity Checklist

Intervention Task	**Yes/No**	**Date(s)***	**Comments**
1. **Attention** prompts for each type of attention before the session	Yes No		
2. **ONLY FOR SINGLE OPERANT** places one set of material out in front of the student with the picture of the type of attention that will be provided	Yes No		
3. **Attention** was delivered on an FR1 schedule	Yes No		
4. **ONLY FOR CONCURRENT OPERANT** places three sets of material out in front of the student with the pictures of the type of attention that will be provided for completing the task	Yes No		
5. **Attention** was delivered on an FR1 schedule	Yes No		

Figure 1. Treatment integrity checklist used for the single and concurrent operant reinforcer assessment.

Experimental Design

A multi-element experimental design was used to determine reinfrocer efficacy across the attention conditions in the single-operant reinforcer assessment. This type of design has several advantages including the ability to control confounding varibles like setting, time, and therapist. The multi-element design also allows you to evaluate the interations between the intervention while minimzes the sequece effects. During the preferense assessment this was displayed by the type of attention delivered was alternated across sessions and was the same type of attention was never delivered for more than two sessions in a row. As only one type of attention was delivered during these sessions, we were able to determine the absolute reinforcing efficacy across attention types. The last reinforcer assessment used a concurrent-operants arrangement, similar to the preference assessment, to determine the relative reinforceing efficacy of the different types of attention. A concurrent-operant arrangement was used in the preference assessment in order to determine relative preference. This was consistent with previous preference assessment research in which two items or pictures have been paired and the participant selects from the options.

Procedures

Each participant underwent a color preference assessment first to assure there was no color dais for condition prompt. Then they went through two preference assessments. Preferences was determined by the frequency of selection for each stimulus. The first preference assessment was across the different types of attention, praise, physical attention, and conversation. The second preference assessment was preference across three different therapists. Following the preference assessment each participant reinforcing efficacy was evaluated of each

type of attention. This was determined by the rate of responding within a session for each type of attention.

Color Preference Assessment. The color preference assessment included a nine-item paired-stimulus preference assessment to determine which colors would be associated with each condition. Each card was paired with every other colored card one time for a total of thirty-six trials. The participant was asked to touch the color they liked best and they were provided with noncontingent praise for responding, sitting nicely, and paying attention. At the end of the session, a preference hierarchy was created by taking the number of times a color was select, dividing it by the number of times it was presented, and multiplying by 100%. The colors were separated into preference ranks including high-preferred colors (80-100%), moderate-preferred colors (40-60%), and low-preferred colors (0-20%). The moderate-preferred colors were used as the SDs for the different attention conditions.

Attention Preference Assessment. A paired-stimulus preference assessment (Fisher et al., 1992) was conducted with each participant to determine high-, moderate-, and low-preferred types of attention. Prior to the start of each preference-assessment session, three, pre-session prompts were conducted. Each picture depicting a type of attention (i.e., praise, physical attention, and conversation) was presented to the participant, the participant was prompted to touch the picture, and the researcher provided the corresponding type of attention. During preference-assessment sessions, pictures were presented to the participant in pairs until each was paired with the other three times for a total of nine trials. After the participant selected a picture the researcher engaged in that type of attention. Duration for each type of attention was on average 2 seconds to assure the student wasn't picking one type of attention more because of the length of time engaged in the type of attention. At the end of a session, a preference hierarchy

was created based on the percentage of trials in which each type of attention was selected. Three researchers conducted the same preference assessment with each participant. Each assessment was conducted on different days to make sure satiation for any type of attention didn't occur.

Attention Reinforcer Assessment. Prior to the start of each reinforcer-assessment session, rules were provided explaining the type of attention delivered during the session (see below) and a pre-session prompt for each type of attention was conducted, similar to the preference assessment. Materials were placed behind each attention picture. This was done for both the single and concurrent arrangement to remind the student what type of attention they are working for. Only during the concurrent operant arrangement, the student had the ability to switch for the type of attention they were working for.

Single-operant RA. During single-operant arrangement sessions, only one type of attention was available. There was one set of materials with a picture of the type of attention available place behind the materials. The participant was told they may work for the type of attention provided, or they may engage in an alternative, low-preferred activity. At the end of the session, the rate of responding was calculated using the method described earlier. Three sessions of each type of attention were conducted with each of the three researchers.

Concurrent-operant RA. During concurrent-operant arrangement sessions, all three types of attention were available. There were three set of materials, each corresponding with a different type of attention. A picture was placed behind each set of materials to indicate which type of attention will be accessed for completing the task using that set of materials. During the session, the participant was able to work for whatever type of attention and switch at any time. Each of the three therapists, conducted three concurrent-operant RA sessions.

Baseline. Prior to baseline sessions, the participant will be told they can "work if they want," and that the researcher did not respond to any responses during the session.

Praise. During praise sessions, correct responses were followed by a single positive statement regarding the participant's behavior (i.e., "That was great!" or "Nice work.") while smiling, but without making physical contact with the participant.

Physical Attention. During physical attention sessions, correct responses were followed by physical interaction with the participant (i.e., tickles, high fives, or back pats) which could be accompanied by giggles or squeals, but no comments regarding behavior (i.e., praise statements).

Conversation. During conversation sessions, correct responses were followed by 7-10 s of verbal exchanges with the participant on a topic of interest to the participant (i.e., cartoons, toys, recess, etc.) and selected by the participant prior to the session. The verbal exchange required at least one comment/question from both the researcher and the participant. These interactions did not include any physical contact or comments regarding behavior (i.e., praise statement).

Chapter 4: Findings

The attention preference assessment data are depicted in Figure 2 by the average number of selections for each type of attention across the three researchers for each participant. Two of the three participants selected the same type of attention across all three researchers, and one of the three participants selected the same type of attention across two of the three researchers. Andrew and Brady selected physical attention most often as compared to praise and conversation across all three researchers. Christopher selected praise most often as compared to physical and conversation with Raymond and Connie and selected physical attention most often with Tina. These data indicate that, for at least two participants, there is one preferred type of attention regardless if the individual delivering it.

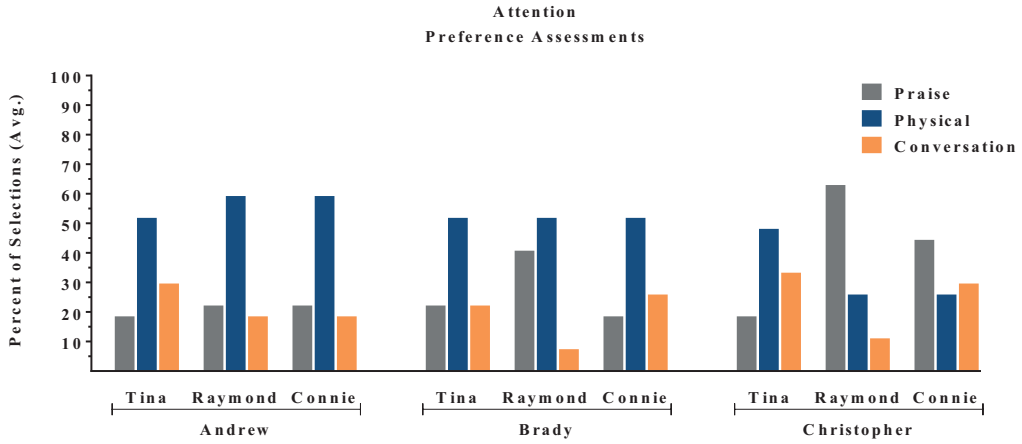

Figure 2. The average percent of selections for each type of attention (praise, physical, and conversation) during the preference assessments conducted across three researchers (Tina, Raymond, and Connie) for all three participants (Andrew, Brady, and Christopher).

Figure 1. *Attention Preference Assessment Across Researchers*

Figures 2-4 depict the data from the single-operant reinforcer assessments. Figure 3 depicts the assessments conducted with Andrew. The top panel shows that all three types of attention did function as a reinforcer when delivered by Tina, with a slight increasing trend for praise and fairly stable responding for physical and conversation. The middle panel shows again,

that all three types of attention functioned as reinforcers when delivered by Raymond, but with a clear distinction between the level of responding for praise as compared to physical and conversation. The bottom panel shows that all three types of attention also functioned as reinforcers when Connie was delivering them. There was also clear differentiation between the level of responding for conversation as compared to praise and physical attention. These data show that, although all three types of attention were not preferred, they all functioned as a reinforcer. Additionally, the most preferred type of attention did not necessarily match what was the most reinforcing. Andrew selected physical attention most often across all three researchers; however, for the two researchers in which there was differentiation (i.e., Raymond and Connie), the most reinforcing type of attention was praise (Raymond) and conversation (Connie). These data indicate that the preference assessments did not determine the most reinforcing type of attention, at least for Raymond and Connie.

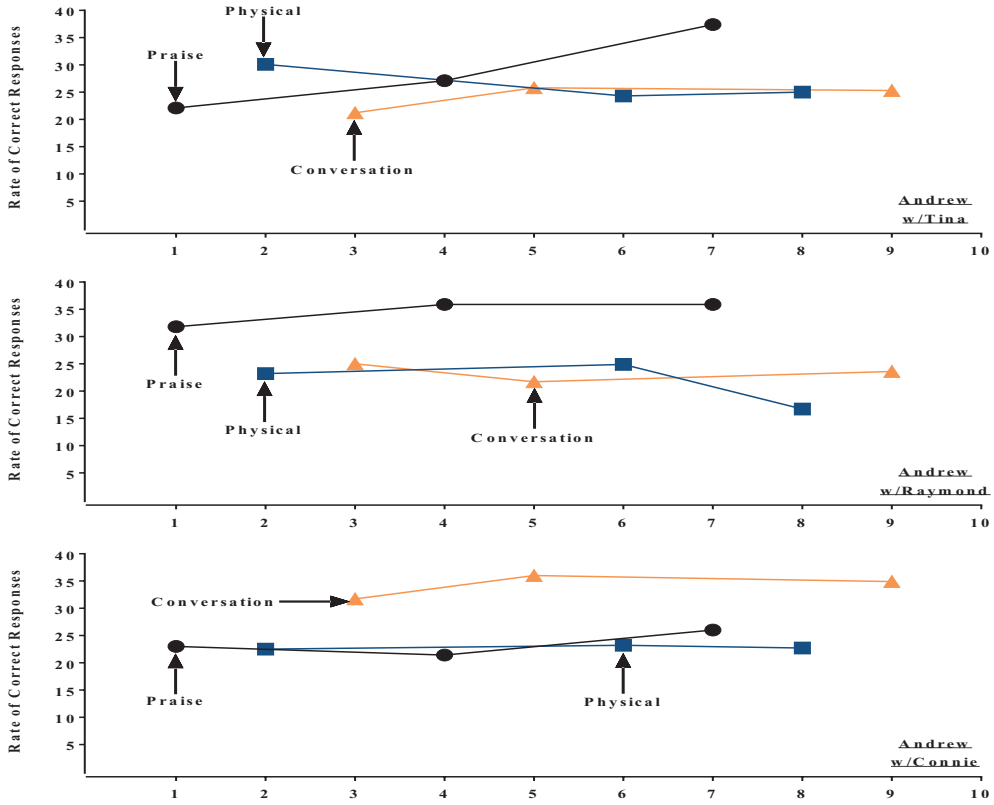

Figure 3. The rate of correct responding for each type of attention (praise, physical, and conversation) during the single-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Andrew.

Figure 4 depicts the assessments conducted with Brady. The top panel shows that all three types of attention functioned at a reinforcer when delivered by Tina, and there was differentiation between the three types. Physical was the most reinforcing, followed by praise and conversation. The middle panel shows that all three types of attention functioned as reinforcer when delivered by Raymond, and there is some differentiation during the second and third sets of assessment sessions in which conversation was most reinforcing, followed by physical and praise. The bottom panel shows that all three types of attention functioned as a reinforcer when delivered by Connie, but there was little differentiation between the types, overall. These data indicate that the preference assessment may have been more accurate at

determining the more reinforcing type of attention with Brady. He did respond at overall higher levels to his most preferred type of attention (physical) with two of the three researchers.

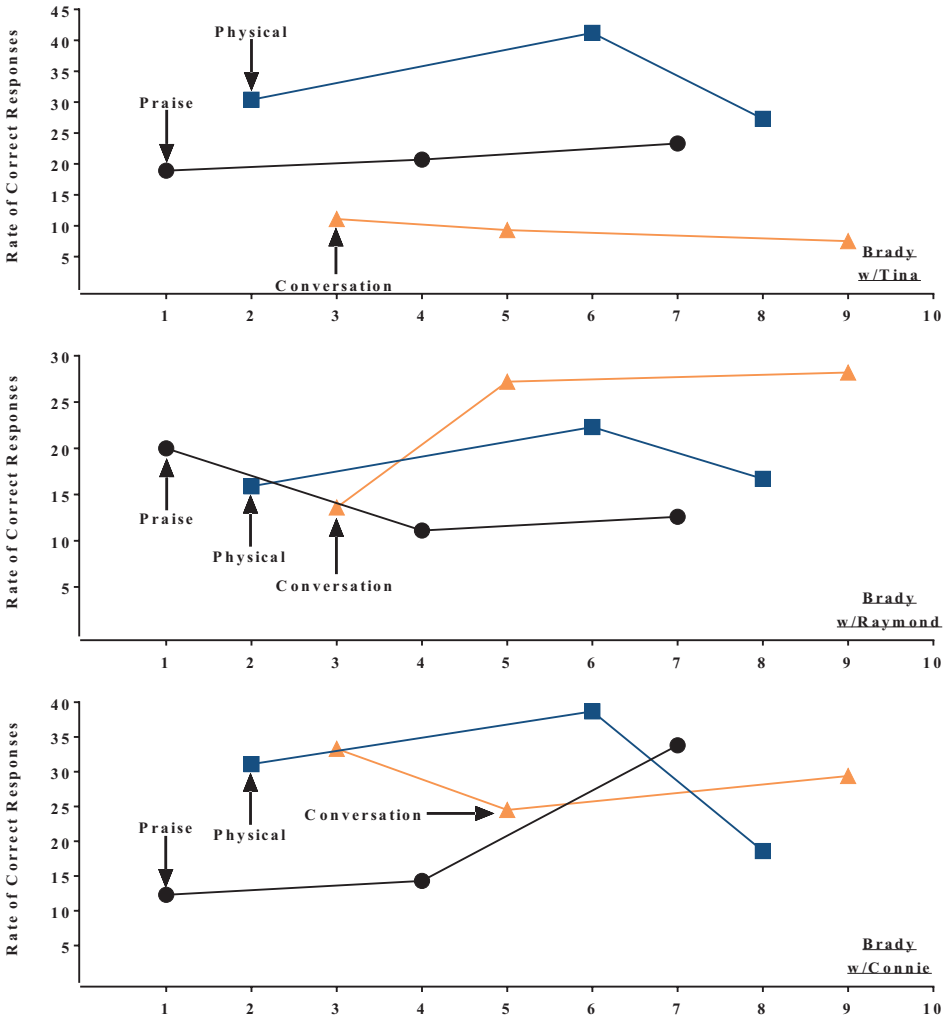

Figure 4. The rate of correct responding for each type of attention (praise, physical, and conversation) during the single-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Brady.

Figure 4 depicts the assessments conducted with Christopher. The top panel shows that all three types of attention functioned as a reinforcer when delivered by Tina. There is a slight decreasing trend in responding for praise, and consistent increasing trends for physical and conversation. The middle panel shows that all three types of attention functioned as a reinforcer

when delivered by Raymond. There was an overall increasing trend in the amount of responding for conversation and fairly stable responding levels for praise and physical. The bottom panel shows that only two of the three types of attention functioned as a reinforcer when delivered by Connie, and there was differentiation between the two types. There was a high and stable level of responding for conversation and a moderate and stable level of responding for physical attention. Overall, there was little to no responding when praise was delivered. These data indicate that the preference assessment was not accurate in determining the most reinforcing type of attention for Christopher. In fact, in the preference assessment conducted by Connie, praise was the most preferred type of attention, and it did not function as a reinforcer during this assessment.

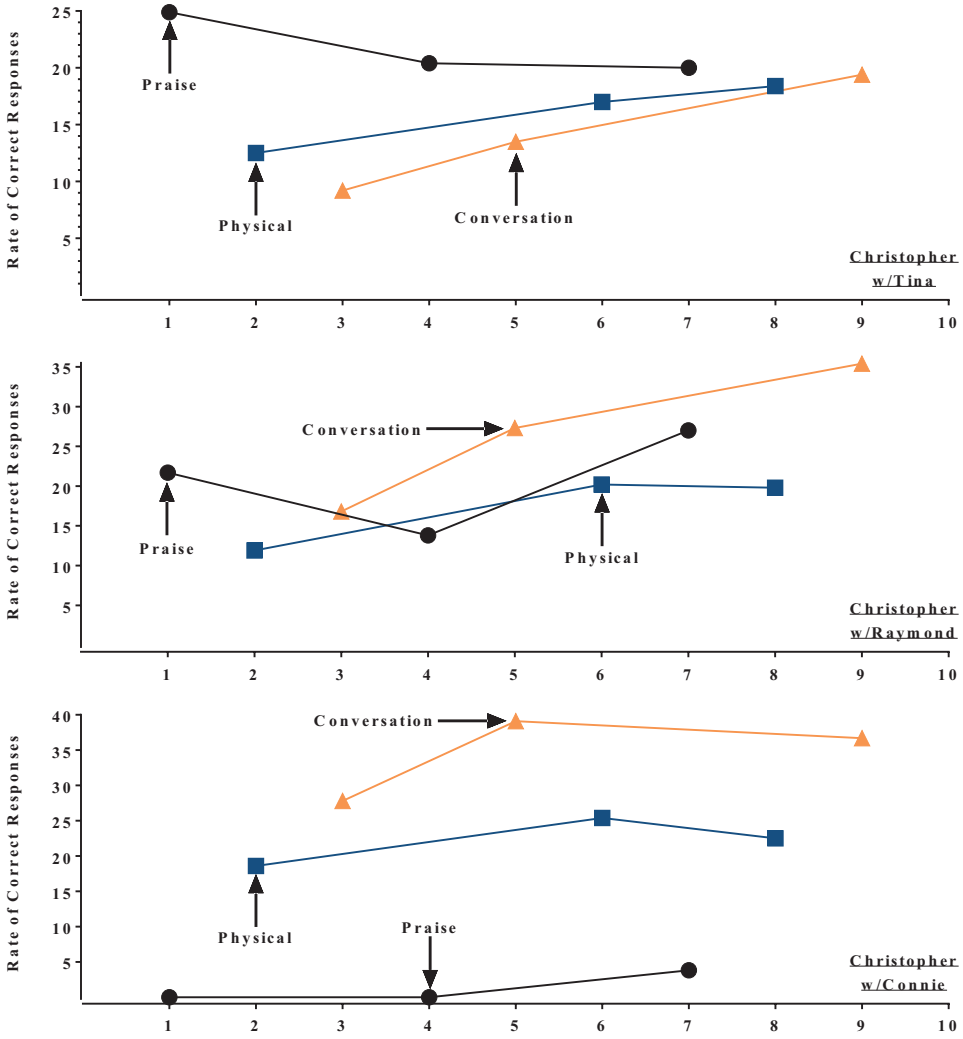

Figure 5. The rate of correct responding for each type of attention (praise, physical, and conversation) during the single-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Christopher.

Figures 6-8 depict the data from the concurrent-operant reinforcer assessments. Figure 6 depicts the assessments conducted with Andrew. The top panel depicts the sessions conducted by Tina, the middle panel the sessions conducted by Raymond, and the bottom panel the sessions conducted by Connie. Across all three therapists, conversation was the most reinforcing type of attention. This matches the single-operant assessment data for Connie, but not the other two researchers, and it does not match the preference assessment data for any of the researchers.

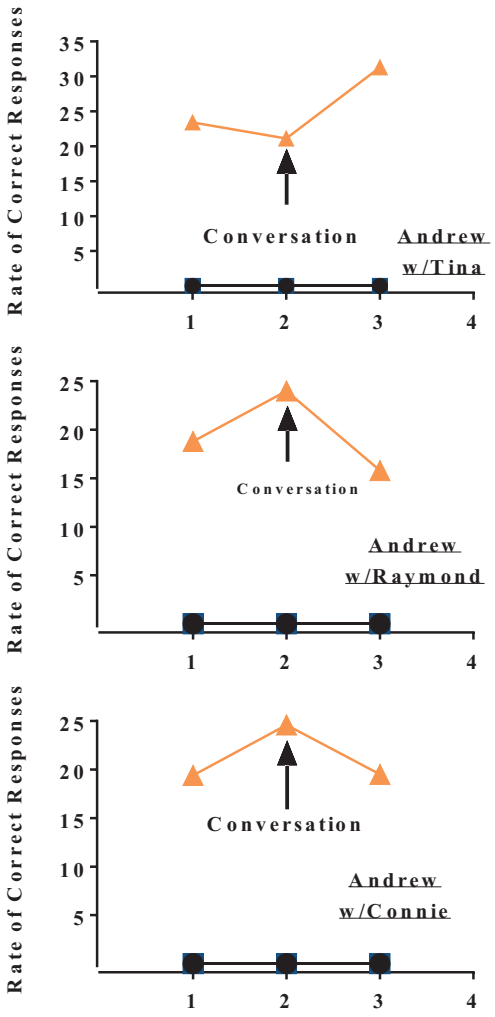

Figure 6. The rate of correct responding for each type of attention (praise, physical, and conversation) during the concurrent-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Andrew.

Figure 7 depicts the assessments conducted with Brady. The top panel depicts the sessions conducted by Tina, the middle panel the sessions conducted by Raymond, and the bottom panel the sessions conducted by Connie. Across all three therapists, conversation was – again – the most reinforcing type of attention. These data matched the patterns shown in the single-operant assessment for Raymond, but not the other two researchers, and these results do not match the preference assessments for any of the researchers.

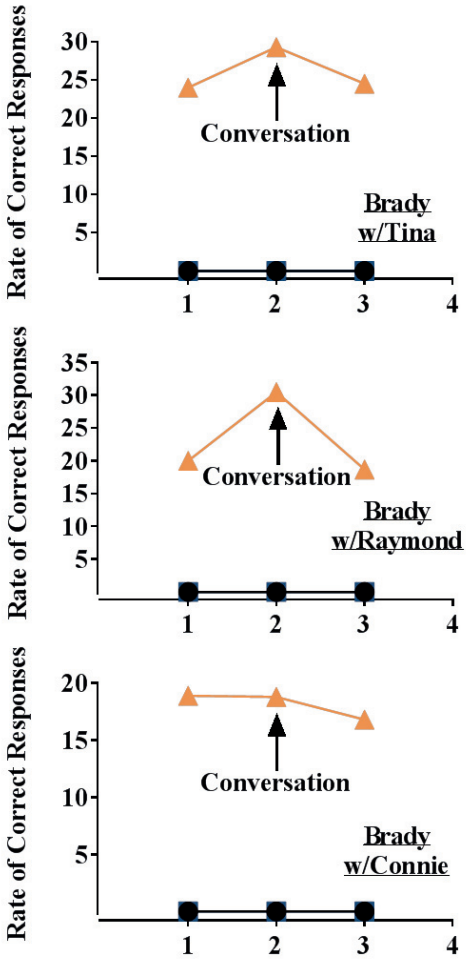

Figure 7. The rate of correct responding for each type of attention (praise, physical, and conversation) during the concurrent-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Brady.

Figure 8 depicts the assessments conducted with Christopher. The top panel depicts the sessions conducted by Tina, the middle panel the sessions conducted by Raymond, and the bottom panel the sessions conducted by Connie. Physical attention was the most reinforcing type of attention, followed by praise, when delivered by Tina and Raymond. Physical attention was the only functioning reinforcer when delivered by Connie. These data were not consistent with the single-operant results for any of the researchers. The data from Tina's preference assessment

did correspond partially to these results; however, in that physical attention was the most preferred and the most reinforcing.

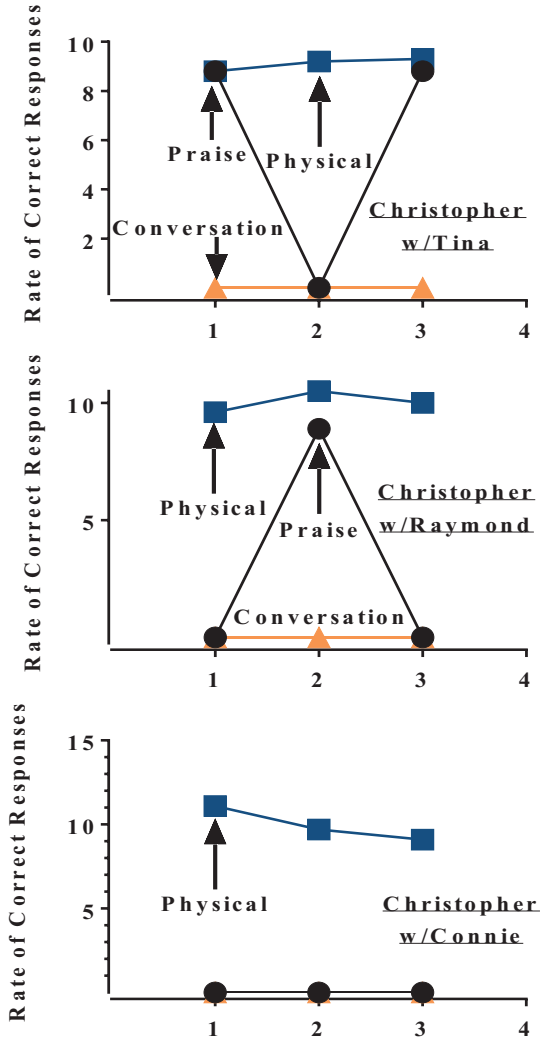

Figure 8. The rate of correct responding for each type of attention (praise, physical, and conversation) during the concurrent-operant reinforcer assessments conducted by three researchers (Tina, Raymond, and Connie) with Christopher.

Chapter 5: Summary, Conclusions, and Recommendations

There are some interesting results from the current study which have some clinical implications regarding using attention as a reinforcer. The purpose of the preference assessments was to evaluate whether the preference hierarchies for different types of attention would be similar across multiple therapists. The results from this study were that for two of the three participants, this was the case; and for the third participant, the same type of attention was preferred across two of the three researchers. These results indicate that, regardless of who is delivering the attention, the same type of attention is preferred across multiple adults. These results seem to mirror what we usually see clinically when various people conduct preference assessments using edibles or toys. Oftentimes, the same items will be preferred regardless of who conducts the preference assessment because it is the items, not the person delivering them, that dictates the preference level. Based on this line of reasoning, it is possible that if one person conducts a preference assessment using different types of attention, the type that comes out a most preferred, may likely be the same type that would be preferred across various staff members. This would imply that each individual therapist does not need to conduct their own preference assessment, which would cut down on clinical expenses regarding time and effort and make the process as streamlined as preference assessments conducted with other stimuli.

The purposes of the reinforcer assessments were three-fold, first, to see if the preference assessments were predictive of the reinforcing efficacy of the different types of attention; second, to see if the reinforcing effectiveness levels of different types of attention were similar – or identical – across researchers; and third, to see if the absolute reinforcing efficacy of the different types of attention mirrored the relative reinforcing efficacy of different types of attention. The reinforcer assessments results included a lot of variability across all three of these purpose

evaluations, which have some interesting conclusions between the current results and previous research.

First, there were few occurrences of consistency between the preference assessment hierarchies and the levels of reinforcing efficacy across participants. The results for only one of the three participants (Brady) showed correspondence between the preference assessments and the single-operant reinforcer assessments, and only for two of the three researchers. This lack of consistency may mean a couple of things. First, it may indicate that the type of methodology used in the current study is not ideal for assessing preferences of different types of attention. The current study used a paired-stimulus method in which pictures of the types of attention were paired and the participant selected the type of attention they "liked" better. This method was also used in the Clay et al. (2013) preference assessment study; however, they were comparing different types of physical attention, delivered by one researcher, which may have affected the outcomes. It is possible that establishing the differences between different types of physical attentions, for example high fives and piggyback rides, was easier for participants because it was a more salient difference than looking at pictures depicting the current types of attention. In the Harper (2014) dissertation, they were able to show consistency across preference and reinforcer assessments using these types of attention; however, their preference assessment methodology varied in that they used a more free-operant methodology style in which all three types of attention were available and they were able to select whichever one they wanted throughout a 2-min session. It is possible that the free-operants methodology was a better indicator of the reinforcing efficacy for each type of attention because all three were available and consistently compared during the preference assessment. Future researchers may consider comparing

different preference assessment methods to evaluate different types of attention to determine which are most reliable in predicting reinforcing efficacy.

Second, the levels of reinforcing efficacy across researchers varied much more during the single-operant reinforcer assessments than during the preference assessments. One interesting result of the single-operant assessments was that for eight of the nine assessments conducted, all three types of attention functioned as a reinforcer, and for five of the nine assessments, there was differentiation between the reinforcing efficacies of the types of attention. First, the fact that all three types of attention functioned as a reinforcer for so many of the assessments indicates that when a single type of attention is available, regardless of the preferences level, it will likely still function as a reinforcer – at least for a maintenance task. The rate of responding during the current assessment were quite high, likely because the target responses were maintenance tasks which were relatively easy for the participants to complete. It is possible that if acquisition tasks were used, the rate would be decreased, and all types of attention may not have functioned as reinforcers.

The reinforcing efficacy of the different types of attention for each participant were not consistent across researchers. This may indicate that there are aspects of each type of attention that, when delivered by different people, affects the value of that type of attention. For example, Brady worked at the highest level for physical attention with Tina and for conversation with Raymond. This may indicate that there are certain aspects about the way these two researchers delivered the various types of attention that affected how much Brady would work to access it. Overall, differences like these were observes across all three participants, which does reinforce the idea that the delivery of attention, and the personal variations associated with it, affects the reinforcing efficacy of various types of attention. Future researchers may consider doing some

post-hoc analyses based on recordings of sessions to begin to determine which aspects of these versions of attention affect reinforcing efficacies.

The third purpose was to evaluate any differences between the absolute and relative reinforcing efficacy of these types of attention. These results were much more consistent across researchers. For two of the three participants, conversation was the only type of attention that was reinforcing. This result is consistent with the results from Harper (2014), which is interesting because these two participants were typically developing, as were the participants in that study. It may be that children with more advanced verbal repertoires find engaging in conversation more reinforcing than participants for whom conversation is perhaps a more difficult, for example Christopher, who has ASD. The results for Christopher concurrent-operant assessments were also more consistent across the three researchers in that physical attention was reinforcer across all, and praise was also sometime a reinforcer with two of the three researchers. The concurrent-operant assessments provide a clearer comparison of the relative efficacy across attention types, and as such these results have more clinical implications. For example, based on these results, it may be deduced that the same type of attention was reinforcing regardless of who is delivering it, so recommendations may be provided regarding delivering that type of attention as a reinforcer for other teachers or caregivers.

However, it is important to note that the most reinforcing type of attention was not always the most preferred type of attention. With that in mind, it would probably be a better recommendation to conduct a brief, concurrent-operant reinforcer assessment instead of a paired-stimulus preference assessment. This conclusion also goes back to the previously mentioned issue of the methods used in the preference assessment. The concurrent-operant reinforcer assessment used procedures similar to the preference assessment methods of Harper (2014),

except with an actual work task required. It is possible that if a free-operant preference assessment had been conducted in the current study, it may have matched more consistently with the reinforcer assessment results. This is, however, an empirical question which would be a great contribution to the research base and clinical implications of using various types of attention as stand-alone reinforcers.

In general, different types of attention do act as reinforcers. This has been shown in previous research and is shown in the results of the current study. These results include some conflicting conclusion as compared to previous research; however, these differences will hopefully lead to some additional research and more information about how to effectively use attention – in isolation – as reinforcers instead of as package with other tangible items such as edible or leisure items. This is an important methodological concern for many working in schools or settings where it is not approved or feasible to deliver such reinforcers and therapists or teachers need to rely on attention to reinforcer appropriate behaviors.

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