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THE EFFECTIVENESS OF A VIDEO-BASED PREFERENCE ASSESSMENT IN IDENTIFYING SOCIALLY REINFORCING STIMULI

by

Rachelle N. Peterson

A thesis submitted in partial fulfillment of
the requirements for the degree

of

MASTER OF SCIENCE

in

Special Education

Approved:

Thomas Higbee, PhD. Major Professor	Timothy Slocum, PhD. Committee Member
Scott Ross, PhD. Committee Member	Mark R. McLellan, PhD. Vice President for Research and Dean of the School of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

2014

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ABSTRACT

The Effectiveness of a Video-Based Preference Assessment in

Identifying Socially Reinforcing Stimuli

by

Rachelle Peterson, Master of Science

Utah State University, 2014

Major Professor: Dr. Thomas Higbee
Department: Special Education and Rehabilitation

The identification of preferred stimuli is a key component in-person centered planning. The most common forms of assessment, however, are limited to items that can be physically presented to individuals. Social reinforcers, or stimuli that involve interaction with another individual, cannot be easily assessed using this traditional format. Difficulties in assessing and identifying preferred social stimuli can severely limit individuals' opportunity to participate in reinforcing social experiences, which are critical for development. This project examined a video-based preference assessment and the reliability and validity with which it identified a defined hierarchy of social reinforcers. The highest and lowest preferred stimuli identified in these preference assessments were analyzed in a reinforcer assessment. For each of the three participants the highest social reinforcer selected increased responding above baseline and low preference conditions. It can be determined that the video based preference assessment identified a true hierarchy of preferred and non-preferred social stimuli for each participant.

(50 pages)

PUBLIC ABSTRACT

The Effectiveness of a Video-Based Preference Assessment in

Identifying Socially Reinforcing Stimuli

by

Rachelle Peterson, Master of Science

The following study was conducted to find out more about a video test that could identify social activities that are motivating for individuals with disabilities. Commonly tests can be administered to find what physical items, food, toys, games and so forth, are preferred but the process becomes infinitely more difficult when social activities and interactions are involved. Research has shown that participation in reinforcing social experiences is critical for development and crucial in social skill building. In this study, a video-based test was analyzed to see how effective it was in identifying these socially preferred activities in three individuals with disabilities. The study began with a parent interview, to identify potentially reinforcing activities, and a brief pretest with each participant. The participants then completed the video test in which they were allowed to choose, via video, which activities they wanted to do. When the video test was complete, the activity that each participant liked the most and least was used in the final phase of the study. Each participant was given an individual task and in each session they were rewarded for completing tasks with their most and least preferred activities. For each of the three participants the most highly preferred activity increased their task completion and the lowest preferred did not have a significant effect. These results suggest that the

video-based preference assessment was able to successfully identify social activities that were preferred and nonpreferred for each participant.

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INTRODUCTION

Preferences for specific stimuli, or potential reinforcers, are most commonly identified using stimulus preference assessments (SPA). Cooper, Heron, and Heward (2007) defined SPA as "a variety of procedures used to determine the stimuli that a person prefers, the relative preference values of those stimuli, the conditions under which those preference values remain in effect and their presumed value as reinforcers" (p. 705). These assessments are typically administered to individuals with disabilities and used in both functional analyses and for behavior intervention planning.

The identification of preferred stimuli is a key component in person centered planning (Hanley, Iwata, & Lindberg, 1999). SPAs are widely used throughout the field and have been associated with effectively identifying hierarchy of reinforcers for individuals with developmental disabilities (Paramore & Higbee, 2005). However, the most common forms are limited in the types of stimuli that can be presented (Snyder, Higbee, & Dayton, 2012). Typically, an SPA is conducted with a participant in a seated position, with varying stimuli presented in front of the participant on a table. The reinforcers used in traditional assessment are primarily tangibles (e.g., food, toys etc.). Other potentially powerful reinforcers such as social stimuli cannot be as easily assessed using this traditional format.

Social reinforcers, or stimuli that involve interaction with another individual, can include a number of different behavioral topographies such as vocalizations, physical contact, smiles, and so forth, and are unique to the individual (Smaby, MacDonald, Ahearn, & Dube, 2007). Problems in assessing social stimuli can severely limit the identification of activities that are actually reinforcing. Participation in reinforcing

social experiences, are critical for development (Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998) and crucial in social skill building. Additionally, increasing appropriate skills using praise and social interactions as reinforcement is common in applied settings. It is important therefore, to identify appropriately reinforcing social stimuli to be used in these skill building activities. The importance of social reinforcing interactions and the limitations that currently exist to identify them, merit further research that will investigate methods for presenting and assessing social stimuli for applied practice (Snyder et al., 2012).

Stimuli in SPAs can be presented in a number of different formats. Single, paired and multiple stimulus presentation methods have been shown to be effective ways of presenting stimuli in SPAs. Some alternative methods have also been presented to address the stimulus limitations of traditional SPAs. Pictures (Groskreutz & Graff, 2009) vocal words (Almeida, Graff, & Ahearn, 2000) and even therapists (Clay, Samaha, Bloom, Bogoev, & Boyle, 2013) can be used during assessment to represent available social stimuli. In a novel study, Snyder et al. (2012) presented an additional format for assessment in which participants were allowed to watch videos of models interacting with tangible items. Participants were allowed to select a preferred item, based on the video and immediately allowed to interact with it.

Video formats have at least two potential advantages in assessing stimulus preference. First, videos have the potential to present complex stimuli in a real life context. Second, videos have the ability to portray sounds and movement in a realistic and contextual way. The study by Snyder et al. (2012) was limited to tangible reinforcers; the videos only portrayed models interacting with toys. Because of the

potential benefits that this video-based format provides, this video based method needs to be extended to other, more complex stimuli.

Literature Review

I primarily used Google Scholar and Ebsco Host, to search for literature. I searched for research on preference assessments using several terms and phrases including: *preference assessments, social preference assessments, alternative preference assessment, social reinforcers, social interactions* and *reinforcer assessments*. I located several articles by finding those that were referenced in my model study (Snyder et al., 2012) and other articles found throughout other research. In total, I found 21 articles that investigated variables similar to my study. Of those, I thoroughly examined 12 which seemed to be most relevant to the topic of alternative preference assessments. Articles were excluded from this review because (a) the articles did not present alternative preference assessment methods that could potentially assess social stimuli, (b) the method presented did not have the ability to assess complex social stimuli, (c) or the research information did not apply to my topic. The four articles that were the most relevant to the current study are reviewed below.

Groskruetz and Graff (2009) evaluated the efficacy of picture-based preference assessments. Three different formats were compared and followed by a reinforcer assessment. The different formats were a tangible assessment, a picture-based assessment with immediate access to reinforcement, and a picture-based method without access to immediate reinforcement. A follow-up reinforcer assessment was then conducted to determine the effectiveness of the identified stimuli as reinforcers. Five individuals with

developmental disabilities participated in this study. The participants were students in a residential school for individuals with autism and were receiving intensive educational and behavioral supports. Andrew was a 17-year-old with autism, who engaged in self injury, tantrums, perseveration and aggression. Bryce was a 17-year-old with autism and Dandy Walker syndrome who engaged in aggression, property destruction, perseveration and disrobing. Derrick, a 17-year-old with autism, engaged in self-injury, aggression, and tantrums. Luis was a 16-year-old with autism who engaged in aggression, property destruction and elopement. Finally, Stewart, a 15-year-old, engaged in aggression and self-injury. The sessions throughout the study were conducted in the participant's educational environment during the school day. Each session lasted 10 min and was administered one to two times per day. To qualify for the study, participants were required to demonstrate photo-to-object and object- to-photo matching skills in a pretest. Participants were required to match edibles to a corresponding pictures and a picture to the matching edible. All participants completed the pretest with 100% accuracy. The participants were allowed to sample each item in the assessment prior to beginning.

The three preference assessments were conducted in a paired stimulus format. The assessments were administered in alternating blocks to control for changes in preference across the study. In each assessment, two items were placed in front of the individual in a predetermined order and the participant was provided with the opportunity to choose one of the available stimuli. In the tangible preference assessment, edible items were presented and an approach to the item resulted in immediate access to the edible. In the pictorial access assessment (PA), two photos of edibles were presented and if the participant approached one, the participant was allowed to consume the corresponding

edible. The actual edible was not visible throughout this assessment. In the final assessment, pictorial without access (PWA), the same pictures of edibles were presented but an approach to a picture did not result in access to that edible item. No edibles were available in this assessment. Responses throughout each assessment were counted by touching objects/pictures. Participants selected preferred stimuli by touching the tangible or its corresponding picture. If the participant did not approach either item within 5 s, no score was given for that trial. Data were taken by a primary and second observer. Agreement scores were calculated by comparing approach scores for each trial from each observer. Frequency data were also collected on problem behavior performed during assessment and agreement was calculated by comparing scores between observers. Additionally, integrity data were taken by comparing the number of correct and incorrect trials. Both interobserver agreement and integrity scores for all phases were 99% and above. Results of the three preference assessments showed similar hierarchies for reinforcers across all participants. The highest ranking reinforcer was the same across all assessments for four of the five participants.

A reinforcer assessment was subsequently conducted. The highest and lowest ranking reinforcers identified in the previous assessments were used. The participants were given a task, paper filing, and across different phases the highest and lowest reinforcers were administered contingent on each paper filed. Results of the reinforcer assessment showed that higher rates of paper filing were found in the high preference conditions than the low preference conditions. The results indicated that the preferences assessments had accurately identified high and low preferred items and that each assessment produced comparable results for each participant. These results support the

efficacy of this alternative picture-based method. Effective reinforcers were identified and successfully applied to increase the frequency of behavior. There are, however, several limitations to this study. The stimuli used in the picture-based assessments were primarily edibles. The pictures directly mirrored the edible items. Although the results of the study showed that the participants could accurately discriminate between the pictured items, no social stimuli were pictured or used. The study did not examine any social stimuli, therefore, it is unknown whether such stimuli could be used in a picture-based method with success. Using social stimuli would be far more complex, picturing activities and interactions may involve verbal interactions, physical contact, or other stimuli not directly discriminable from a photograph.

Almeida et al. (2000) conducted a study to examine another alternative SPA, a verbal preference assessment. Participants involved in the study were required to use speech as their principal mode of communication, show a minimum vocabulary score through assessment, and demonstrate the ability to follow and comprehend two step instructions. Participants had to demonstrate spoken words to object matching skills. Six participants met the minimum requirements and were included in this study. Angelo was a 17-year-old with pervasive developmental disorder (PDD), attention deficit hyperactivity disorder (ADHD) and Asperger's syndrome. Mort was a 19-year-old with PDD and emotional and learning disabilities. Les was a 15-year-old with ADHD and Tourette's syndrome. Larry was a 20-year-old individual with Tourette's syndrome, obsessive-compulsive disorder (OCD), depressive disorder, atypical development disorder, and borderline cognitive functioning. Hans was an 18-year-old with behavior disorder and mental retardation. Finally, Dom was an 18-year-old with posttraumatic

stress disorder (PTSD), ADHD and moderate mental retardation. The assessment sessions were conducted in the participant's school classroom or group home. Each session was approximately 10 min long and eight were conducted for each with a 5-min break in between. Each participant participated in two types of preference assessments, tangible and verbal. In the tangible assessment, eight edible items were used. Each participant was familiar with the items presented. In a randomized order, two edible items were presented for 10 s. The item that the participant approached was given to them to immediately consume. In the verbal assessment, the same tangible items were used. The trials consisted of the therapist asking, "Do you want X or Y?" The physical stimuli were not visible; the participants were only exposed to the spoken name. A choice was made by an oral statement, and stimuli were immediately given to the participant to consume.

The results of the two assessments found the same two high preference items for four participants. Additionally, both assessments identified the same two lowest preference items for five out of six participants. A high degree of correspondence was found across five participants for high and low items but relatively lower agreement was found for moderately preferred items. One participant, Dom, chose to *save* his edible items until the end to eat; there was very little correspondence found between his two assessments. It is also noted that Dom had the lowest IQ score in the group of participants. Angelo, the participant with the highest IQ level, showed the highest level of correspondence between the two assessments.

The results of this study suggest that verbal preference assessments may be a valid assessment tool. The benefits of using a verbal method could be extensive. The ease, speed and pragmatics of this method could be very beneficial in an applied setting.

However, the researchers note that it may only be an efficient method for specific individuals. This method is very limited in the population that it can serve. Another noted limitation is the absence of a reinforcer assessment. With no follow up assessment, it is unclear if the identified reinforcers really function as such.

Clay et al. (2013) presented another technique for identifying preferred social stimuli in which individual therapists, paired with a specific form of social attention, were presented for selection in a forced choice format. Five participants were included in this study, Alex, Sofia, Chris, Kyle and Rutherford. Each participant was referred for assessment and treatment of severe problem behavior. An informal interview was initially conducted with caregivers to determine what kind of social interaction the participant enjoyed. Four, reportedly preferred interactions, were selected for use in each participant's preference assessment. Additionally, four therapists were used for each preference assessment, each assigned to one of the four designated forms of social interaction.

The assessment was presented in blocks and in-block trials were presented until all combinations of therapists and social interactions had been paired. In total, six blocks, or 30 trials, were conducted for each participant. Prior to each assessment block, the participants engaged in a pre-exposure session in which physical and verbal instructions were used to prompt participants to approach the therapist that delivered a specific social interaction. This exposure continued until the participant had engaged in each of the interactions. Each forced choice trial consisted of two therapists at opposite ends of the room with the participant positioned in the middle. The participant was instructed to "pick one" and expected to approach the therapist to engage in their designated form of

social attention. When a selection was made, the therapist briefly delivered social attention. Each interaction consisted of a verbal statement and physical contact. The therapist alternated the left and right positions in the room throughout the assessment.

When this initial assessment had been completed, the therapists were paired with a different form of attention and the assessment was repeated. The highest and lowest preferred forms of social attention were designated to the opposite therapist that had been used in the previous assessment. Data were collected throughout the two assessments by trained observers and interobserver agreement was 100% across trials. After the completion of the preference assessments, a reinforcer assessment was then conducted using the highest selected form of attention identified in assessment. Each session was five minutes long, during baseline conditions no reinforcement was delivered for responses and during reinforcement conditions the selected social attention was delivered on contingent on responses in a FR1 schedule. The results of the reinforcer assessment showed that the most preferred form of attention, identified in the preference assessment, did function as a reinforcer for all participants.

The results of this study do suggest that using therapists to represent different forms of social attention in preference assessments may provide accurate results. The most highly preferred activity identified in the preference assessment functioned as a reinforcer across the board for all participants. Despite the promising results, this method does present some practical limitations. The number of staff or personnel required for this type of assessment is significant. In a typical applied setting one staff member is usually designated to perform this type of assessment. Finding four staff members to participate may be a challenge. Despite the ability of this assessment to present a number of varying

and complex social interactions, this assessment may not be logistically possible for applied settings.

The results of the alternative SPAs have been promising because the picture, verbal and therapist methods were able to successfully identify preferred items or activities. With these alternative methods producing reliable results, but also presenting applied limitations, another alterative, i.e., video-based method deserves investigation.

Snyder et al. (2012) analyzed the use of this video-based method in preference assessments. This study was the first to use videos as part of the assessment process. Previously, Mechling and Moser (2010) conducted a preference assessment using videos but only included video as a contingent reinforcer when responses were selected. Six participants diagnosed with autism were involved in this video-based assessment study. Participants were enrolled in an intensive behavioral preschool program. To participate, participants had to demonstrate choice making skills between tangible stimuli and video-to-object matching skills. These skills were assessed in a pre-study matching assessment. In this matching assessment, the participant was shown a 5-s video clip of an unknown child interacting with a stimulus. Participants were then presented with three stimuli in front of them, one of which matched the stimulus shown in the video. Participants were instructed to “match” by touching the stimulus depicted. Ten trials were conducted. All SPA sessions were conducted in their school environment in a research room. Each assessment lasted 15 to 30 min and was conducted in the same day with 1 hr of break time. Thirty trials were conducted in each assessment and each stimulus was presented 10 times. A tangible assessment, similar to the ones presented above was conducted. Additionally a video assessment was conducted. Each participant was previously exposed

to each video clip and its corresponding stimulus. The therapists conducted the assessment with two DVD players presented on a table in front of each participant. Ten-s videos that portrayed an unfamiliar child interacting with one of six different toys were played on each DVD player. The video on the left was played first every time, followed by the video on the right. Each clip was paused with a still image on the screen and when a choice was made the participant could interact with the physical stimuli for 15 s. One exception was made to this procedure throughout assessment. A participant seemed to demonstrate a bias towards the video on the right. The participant selected the right hand video 26 out of the 30 presented trials. The assessment was conducted again with this participant, the videos were played simultaneously and she was told to choose as soon as the videos started. Data were taken on choices made throughout each assessment. A choice was defined as, “making physical contact with or pointing to a toy or DVD player.”

Revised videos were used for three participants. Videos were revised in order to clarify and improve discrimination. Instead of portraying the whole body of the individual interacting with the object, the clips were revised to focus on the model’s hand playing with the stimulus. Correspondence between the two participants varied from one to six. However, the highest ranking stimulus for five of the six participants was the same across assessments. For four participants, both the highest and lowest ranked reinforcers corresponded between the two assessments. This study leaves many avenues open for future research. The potential for evaluation of more complex stimuli is significant for this video-based format but not evaluated in this study. In other alternative methods of assessment, verbal and pictorial, high correspondence between tangible and alternative

assessments have resulted in the identification of effective reinforcers, this provides even more incentive to review the efficacy of the method presented in this study. Different formats for video clip presentation, alternating lengths and more complex stimuli need to be investigated to validate this method of assessment. A limitation of this present study was the lack of a reinforcer assessment. Without this, the effectiveness of the identified reinforcers cannot be determined. Research using this same video-based method with immediate access to complex stimuli and following the presented procedure with a reinforcer assessment will be the focus of this study.

The studies outlined above provide four potential methods for assessing and identifying preferred social stimuli. The pictures, verbal, and paired therapist methods each have restrictions that may limit the types of complex activities that can be presented, the population that can access the assessment and other practical limitations such as the number of staff members required for each assessment. These limitations could be resolved using a video-based method. Watching a video of a social interaction may make the task of discriminating relevant stimuli easier than a single picture portraying the same event. A video method could be administered by one therapist or staff member and could potentially assess a broad range of individuals with limited speech or cognitive skills.

Purpose and Research Questions

As explained in the review above, more research needs to be conducted on SPA methods with social stimuli. A promising avenue for this research is a video-based method. The purpose of this study is to evaluate the potential of a video-based preference assessment to identify highly preferred reinforcers for individuals with developmental disabilities. The study will address the following research questions:

1. Can a video-based stimulus preference assessment be effectively used to identify a hierarchy of preferred social stimuli as measured by percent of total selection responses in individuals with significant disabilities?
2. Will the highly preferred stimuli identified in a video-based preference assessment function as effective reinforcers as measured in a reinforcer assessment when compared to low-preference stimuli or baseline conditions in individuals with significant disabilities?

METHOD

Participants and Settings

This study included three female participants with autism all receiving behavior services from specialists employed at a medical clinic in the Western United States. The participants, Cindy L., 23, Stevie N., 15, and Susanna H., 13, were all enrolled in public and private educational and day programs and were having difficulty with social interactions and relationships. All participants demonstrated typical hearing and visual acuity as measured by a basic public school system assessment or evaluation by a medical professional. All participants were capable of physically making a selection response and did not require specific accommodations for participation. Participants were required to have basic matching skills as demonstrated in learning environments and reported by data collection and verbal report of advisors. Health, medical and ethnic characteristics were not considered in the selection process for the participants. As an employee of the clinic where they were receiving behavior services, I had access to all of the necessary contact information for each participant. I, as the student researcher, contacted each participant's guardian with a formal letter outlining the study and answered all of their questions and concerns in person.

The study, including the preference and reinforcer assessments, was primarily conducted in a behavior lab in a clinic in the Western United States. The behavior lab was housed within this clinic and was primarily used for analysis and assessments. The room itself was approximately 3 m by 3.5 m. The room had a square table in the center with four chairs surrounding it. One wall had a large two-way mirror that connected to an

observation room on the other side. The mirror showed the reflections of those in the behavior lab and provided full visual access of the space to anyone in the observation room. The room was equipped with recording and video equipment, and all sessions were recorded for review with permission. All assessments were completed at the table in the behavior lab with one participant seated next to the student researcher. The independent observer reviewed all sessions via recordings.

Experimental Observations/Assessments

A pre-matching assessment was conducted with each participant to determine if they each had the necessary video matching skills needed to participate in the video SPA. Each participant was presented with two 5-s to 10-s video clips, side by side, of an unfamiliar individual engaging in a social interaction or activity. The student researcher then performed one of the activities shown in the video with the assistance of an unknown adult. The participant was then instructed to “match” by selecting the video that matched the activity performed by the researcher. Participants were expected to match the performed stimuli presented with the corresponding video clip. The same stimuli were used in the pre-matching assessment as was used throughout the experimental phases. A selection was defined as the participant pointing to or touching one of the videos presented. Ten trials were conducted and participants were expected to achieve a score of 100% on the pre-assessment to be included. Each participant achieved the percentage necessary on the first attempt, Cindy had 100% accuracy, Stevie had 100%, and Susanna had 100%. Three other candidates were tested but did not achieve the percentage score necessary to continue. Additionally, an interview was conducted prior to

the pre-assessment with the guardians to determine which social activities to use across assessments. (See Appendix A for complete interview form).

Dependent Variables and Response Measurement

The primary dependent variable in the first phase of the study was each participant's selection responses expressed as a percentage of times a video was selected when available for selection. The preference assessment was presented in a forced choice video format. The participant indicated a choice for one of the two presented videos, showing specific social activities, by pointing to or touching one of the video screens. (See Appendix B paired stimulus preference data collection sheet.) Preference for each activity was calculated by dividing the number of times an activity was chosen by the total number of times it was presented. These items were then ranked in a hierarchy of preferred social activities according to the percentage selected score. The stimuli presented to each participant were selected from the interviews and items reported as potentially high and low preferences.

The dependent variable in the second phase of the study, the reinforcer assessment, was determined after participants had been selected and pre-matching assessments were conducted and scores were obtained. The dependent variables in this phase were specific free operant tasks that each participant had in her repertoire but was not currently performing at high or appropriate rates. For Cindy the task was putting on her jacket and zipping it up. This was defined as putting both arms in the correct holes of a pink rain jacket, connecting the zipper pull and zipping the zipper up to her chin. Time spent unzipping the jacket and taking it off was not included in the trials. For Stevie the

task selected was tracing her name. She was provided with a stack of note cards that each had an outline of her name. The task was defined as tracing the letters in her name using a pen and her dominant hand. Correct order was not required to be counted. Finally for Susanna the task was paper folding. She was provided with stacks of white note cards and was required fold a card twice in half. Two folds in any direction were required for completion of the task. A frequency measure was used to track the number of times the task was performed throughout each condition of the reinforcer assessment. (See Appendix C for complete data collection forms.)

Throughout the study, I was the primary data collector. I used a clipboard with the respective data collection sheets for each participant connected to it. I recorded each choice in the preference assessment and the frequency responses with a tally mark on the designated data collection sheets.

Interobserver Agreement

A second independent observer collected data from recorded sessions during all preference assessments and 56% of reinforcer assessment sessions for Stevie, 86% of sessions for Susanna and 100% of sessions for Cindy. Agreement was defined in phase one as both observers recording the same choice made by the participant in the forced choice trials. Interobserver agreement (IOA) was calculated using the point to point method by dividing the number of agreements divided by the total number of opportunities and converting the raw score to a percentage. IOA for the preference assessment phase was 100% across all participants. In the second phase, agreement was determined using the total count method. Frequency data was taken by both the student

researcher and the independent observer. IOA was then calculated by dividing the smaller count by the larger count and multiplying the quotient by 100 to get a percentage score. The total IOA score for the reinforcer assessments observed via video was 100% for Stevie, Susanna, and Cindy.

All data collectors were required to complete the necessary training in the CITI modules before beginning data collection. IOA criteria throughout the study were expected to be 80% or above across all phases and if it fell below all data collectors would have had to undergo additional training. This was not necessary as IOA scores never fell below these criteria.

Treatment Integrity

Treatment integrity data were collected during all preference assessment sessions and all reinforcer phases observed. For Stevie this was 56%, 86% for Susanna and 100% for Cindy. Components of the video-based assessment that were evaluated included whether or not access was immediately provided to chosen stimulus, and whether or not videos were played simultaneously as indicated. Treatment integrity was calculated at 100% across all preference assessments. In the reinforcer assessment phase, treatment integrity was assessed based on the correct contingent reinforcement delivered, immediate delivery of the reinforcement, and on the presence or absence of other any other reinforcement delivered during the assessment. Treatment integrity was calculated at 100% for Cindy and Susanna and 99% for Stevie across the reinforcer assessment sessions reviewed (see Appendices D and E for full treatment integrity data sheets).

Experimental Design

A multiple baseline across participants design (Cooper et al., 2007) combined with an alternating treatment design was used during the reinforcer assessment phase of the study. This was chosen to evaluate the effects of both the high and low preference social activities on the frequency of participant responding. This design was composed of alternating treatment components embedded within multiple baseline design. Following initial baseline sets of 5, 7, and 9 in which no systematic consequences were delivered based on target behavior, the highest and lowest ranking reinforcers identified were contingently delivered on the target behavior in alternating treatment sessions with returning baseline sessions. Treatment and baseline conditions were repeated for at least five sets or until a fairly stable pattern was obtained for the high preference condition.

Procedures

Phase 1. Video-based preference assessment. Prior to the video-based preference assessment, five social activities were selected for each participant based on the preference assessment interview conducted in the pre-assessment phase. For Cindy, videos representing singing together, high fives, arm rub, handshake and praise were used. For Stevie, hugs, back rub, high fives, thumb war and dancing were presented and for Susanna dancing, hugs, reading a book, arm rub and handshake were shown. For Cindy and Stevie the results of the initial video assessment showed tied results for high or low activities. Subsequent assessments had to be conducted to achieve clear results and the following stimuli were used. For Cindy videos portraying a hug, thumb war, dancing, knuckles and arm rub were used and again tied results were seen. Finally pat on the back,

thumbs up, arm rub, spinning and arm around were presented and a clear high preference item was selected and a revised assessment produced the low preference activity. For Stevie videos used in the second assessment included, back rub, dancing, arm rub, reading a book and funny faces and produced definitive high and low preference activities. Before conducting the preference assessment, the participants were exposed to each of the pre-selected five video clips and engaged in the corresponding social activity with the student researcher. Direct access to the selected social stimuli was provided throughout each trial of the preference assessment after each selection was made (Tessing, Napolitano, & Axelrod, 2006).To conduct the video-based preference assessment, two identical video screens approximately 30 cm apart were placed 15 cm in front of the participant. In each trial, the videos were played simultaneously in a continuous loop. The total preference assessment included five stimuli across 20 trials. Each stimulus was paired with all other stimuli and the locations were alternated in the second presentation. After both videos had been activated, the student researcher instructed the participant to “pick one.” The participant then made a choice between the two presented stimuli. The selection response was defined as touching, pointing or gesturing with one finger or hand towards one of the two presented video screens. Immediately after selecting a stimulus, the student researcher recorded the selection with a circle on the designated data sheet and then engaged the participant in the selected social activity for approximately 30 s. After 30 s the preference assessment resumed and the next two video clips were presented. This same sequence was replicated until all 20 trials of the preference assessment had been conducted. The scores were then calculated as indicated above in the response measurement section and a hierarchy of preferred

social reinforcers was established. The highest and lowest preference reinforcers were used in phase two of the study. For Cindy the high preference activity was an arm rub and the low preference was a pat on the back, for Stevie the high preference was a back rub and the low was reading a book together and finally, for Susanna the high preference was an arm rub and the low preference was reading a book together.

Phase 2 Reinforcer assessments. A multiple baseline across participants design paired with an alternating treatment design was used throughout this phase. Initial baseline conditions were staggered in time and subsequent treatments alternated between high and low preference and returning baseline conditions. The two treatment and baseline conditions were delivered in sets of three each set including both treatments and one baseline. The order was randomly determined and no two conditions were delivered right after each other. Before beginning each session, the participant was physically guided or shown a model of the response that they were required to perform throughout the session. Additionally, in treatment conditions, they were exposed to the reinforcer available in that condition. Each treatment condition began with the therapist saying "when you do this (modeling or guiding the designated response), you get this. Each condition lasted approximately 3 min but reinforcement and instruction time were not included in the total session time. Reinforcement delivered did not exceed 30 s for any activity.

Baseline. In the baseline phase, the individually chosen task was placed in front of the participant on the table. The student researcher then prompted the participant to complete the task the first time, after the first prompted task the participant then independently engaged in the activity. No reinforcement was delivered contingent on

responding. Each baseline session was terminated after the determined time interval had elapsed and a frequency count of the number of responses was collected.

High preference treatment. In the high preference conditions, the activity identified in the video-preference assessment as the most highly preferred was delivered on an individual schedule for each participant. The schedule was based on the frequency of responding during baseline conditions and for each participant reinforcement was delivered on an FR1 schedule. The student researcher prompted the participant to complete the task and the highly preferred social activity was then provided based on completion of that task. Frequency of participant responses was again recorded and the session was terminated after time interval of three minutes, excluding reinforcement and instruction time, had elapsed.

Low preference treatment. The procedures and the tasks were identical to the high preference condition except the lowest preferred activity, as identified by the video-preference assessment, was administered contingent on participants' responses.

RESULTS

The results of the preference assessment for Cindy L. as stated above were initially inconclusive. Three preference assessments and one revised assessment were completed before a definitive high and low preference activity was identified. The results are shown in Figures 1, 2, 3, and 4.

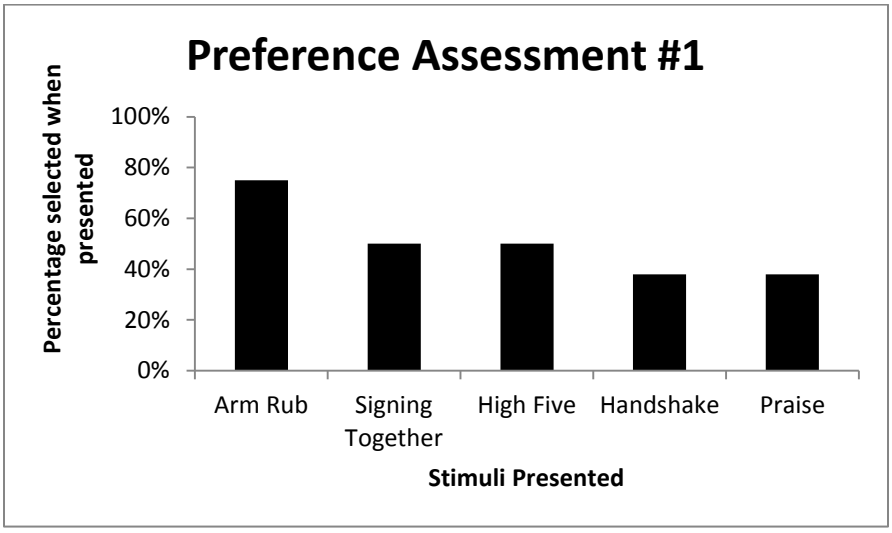

Figure 1. Results of the first video-preference assessment for Cindy.

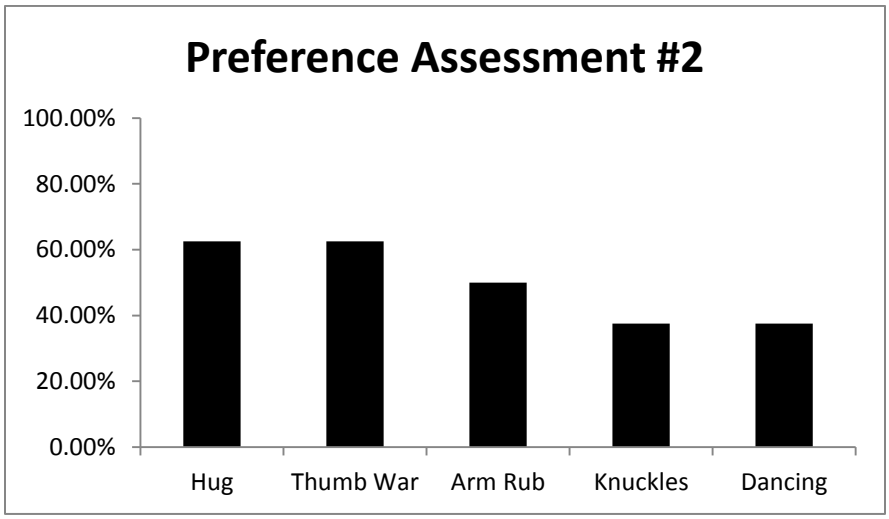

Figure 2. Results of the second video-preference assessment for Cindy.

With the above results, the high preference activity selected for Cindy was an arm rub chosen 75% of the time and the low preference activity was a pat on the back chosen 33% of the time. These activities were used as reinforcement in the high and low treatment phases.

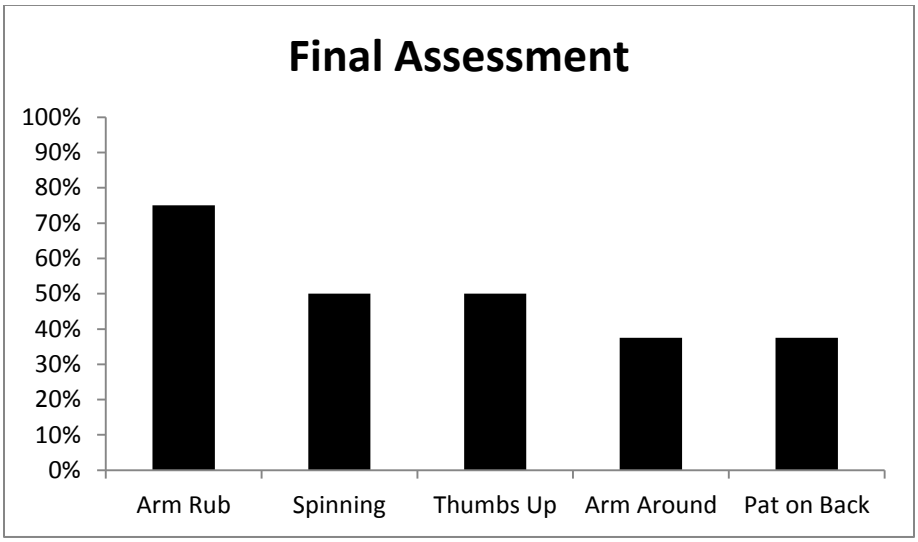

Figure 3. Results of the third video-preference assessment for Cindy.

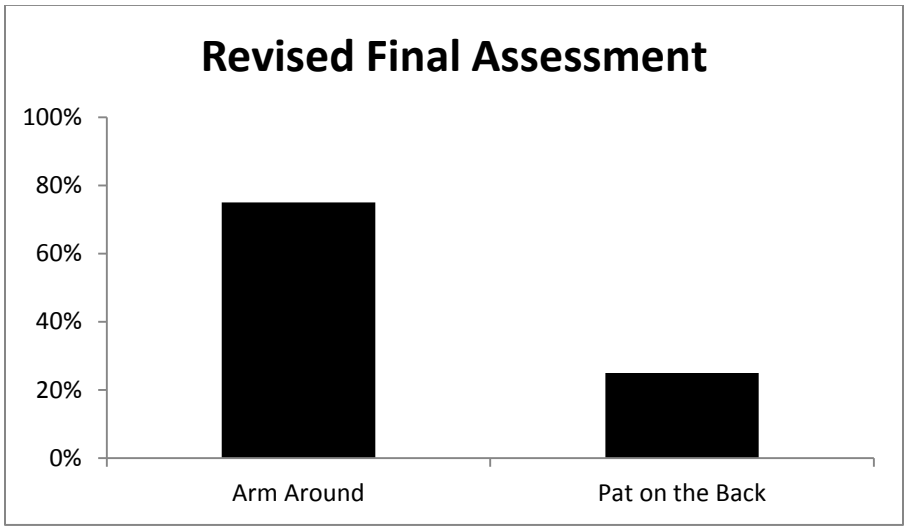

Figure 4. Results of the revised video-preference assessment for Cindy.

Two preference assessments were necessarily conducted for Stevie N. due to a tie with the top three reinforcing activities in the first assessment. The results of both are shown below in Figures 5 and 6.

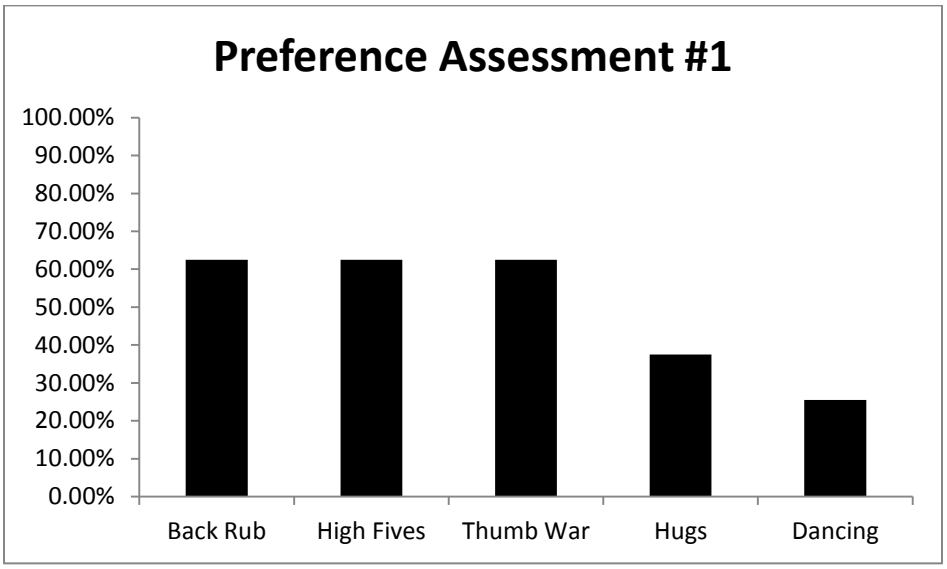

Figure 5. Results of the first video-preference assessment for Stevie.

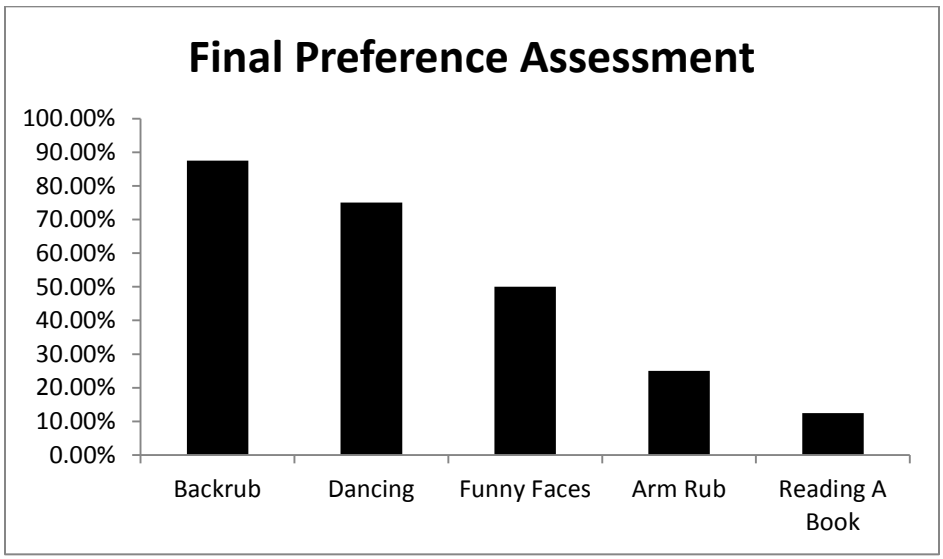

Figure 6. Results of the second video-preference assessment for Stevie.

The second preference assessment showed that the high preference activity, back rub, was selected 87.5% of the time and the low preference activity, reading a book, was selected 12.5% of the time. These two activities were used in the second phase.

Finally for Susanna H. a high and low social preference activity was ultimately identified during the first video assessment. The results are shown in figure 7.

Reading a book was used as the low preference reinforcing activity, it was selected 12.5% of the time and arm rub was used as the high preference activity selected 87.5% of the time.

For Cindy the task selected, putting her coat on and zipping it up, was chosen after a number of other tasks were tried. Due to the participants learning history with the student researcher, she was willing to comply at high rates to almost all of the tasks that were presented to her, even if they were not preferred.

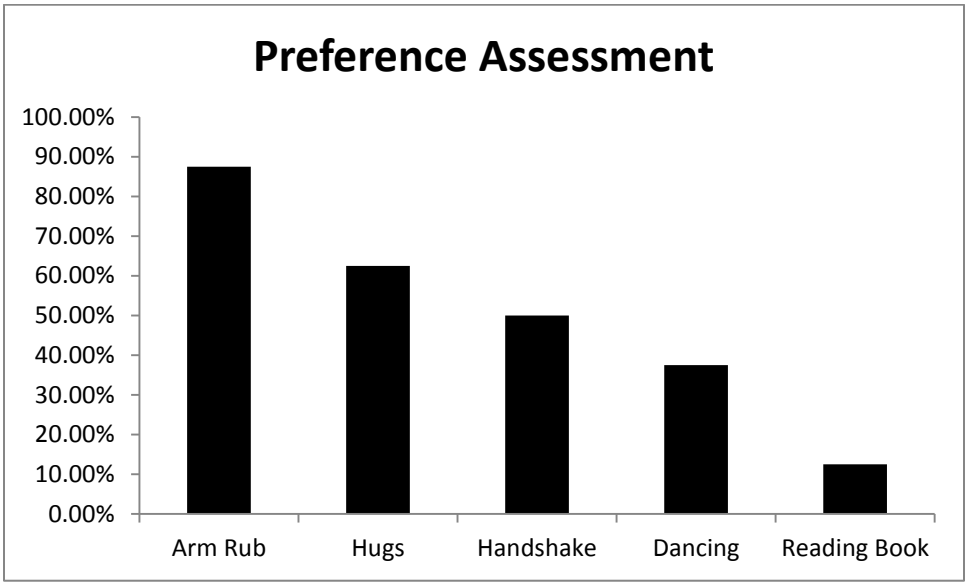

Figure 7. Results of the video-preference assessment for Susanna.

Because of this high responding, it was necessary to provide a low preference alternative to the task. This was deemed necessary to provide participants another option to engage with as an alternative to the task presented. It was intended to reduce responding based on a learning history of compliance and to prevent the targeted task being completed because there was nothing else to do. This was generalized across all treatment conditions and participants. Five items were presented in a row to each participant. They were instructed to pick what they wanted to play with and then allowed to engage with the item for 30s. That item was then removed and they were instructed to pick again. Based on the results of this MSWO assessment, the lowest preferred item was placed by the task and provided as an option for each participant. For Cindy the option of playing with a hole punch or putting her coat on and zipping it up was presented. The time it took for Cindy to take her coat off and receive reinforcement were not calculated into the three minute trial. The results of the reinforcer assessment for Cindy are shown in Figure 8.

The baseline and low preference treatment conditions produced varied, overlapping responding. Three out of five baseline conditions showed 0 tasks completed and two out of five low preference conditions showed the same with 0 responses. The other trials vary with responding seemingly unpredictably with two trials of baseline scoring at 6 and 7 and three trials of low preference scoring at 7, 9, and 10. It was determined, due to the confounding nature of these two data sets that the low preference activity, pat on the back, did not function as a reinforcer for Cindy and was correctly placed in the bottom of the preference hierarchy. The high preference reinforcer however produced higher responding in every treatment set and showed an increasingly upward trend as the trials were conducted. The frequency of responding across the five trials was

8, 9, 9, 11, and 12 respectively. With this result in combination with the total count across sessions it was determined that the high preference activity, arm rub, did indeed function as a reinforcer and was correctly identified as such in the SPA.

For Stevie the item identified in the MSWO as the least preferred was a manila folder. This item was presented as an option to engage with when asked to trace her name. The results from the reinforcer assessment are shown below in Figure 8.

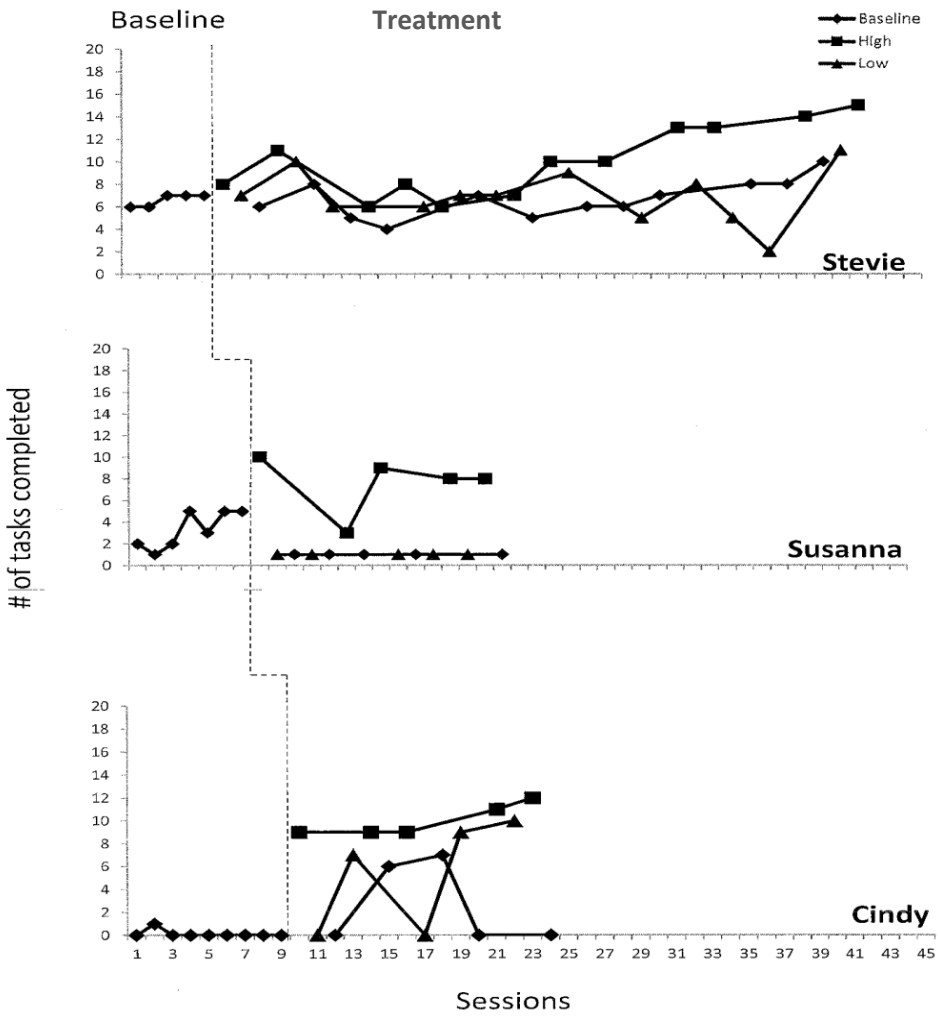

Figure 8. Results of the reinforcer assessment for Cindy, Stevie, and Susanna.

In total, 12 treatment sets were conducted for Stevie. The first initial data points across conditions showed undifferentiated responding with high preference at 8, 11, and 6, low preference at 7, 10, and 6 and baseline conditions at 6, 8, and 5. It was necessary to complete more treatment sets after set 5 when high preference responding dropped below baseline, 7, and low preference, 7, treatments with a score of 6. This was the only set out of 12 in which the high preference reinforcer did not produce the highest rate of responding. Both baseline and low preference conditions had variable response patterns that separated significantly, however these separations alternated between high and low for both conditions. At session 23 and 25 baseline was at 5 and low preference had a score of 9. In the final few data points, excluding the last point, baseline shows higher responding with scores of 8 and 8 and low preference scores at 5 and 2. The final data points make a slight cross again with baseline at 10 and low preference at 11. The data points do not vary enough from baseline to definitively show that the low preference activity, reading a book, functions as a reinforcer. The high preference condition showed higher responding in eleven out of twelve sessions and shows and increasingly upward trend after set 8 with responding at 10, 13, 13, 14, and 15. It can be determined from these data that the high preference reinforcer, a back rub, did function as a reinforcer and was correctly identified as a preferred activity in the preference assessment.

Susanna selected the manila folder in the MWSO last and it was therefore presented to her across conditions as an alternative activity to paper folding. The results from the reinforcer assessment are shown in Figure 8.

Susanna's results are the most clear of the three participants. Baseline and low preference treatment conditions stayed at completely flat and stable rates across all

treatment sets with a score of 1 in all treatment sessions. The low preference activity, reading a book together, clearly does not function as a reinforcer as it perfectly follows baseline responding. The high preference activity, arm rub, showed high rates of paper folding across treatment sets with scores of 10, 3, 9, 8, and 9. The data clearly represents that this activity functions as a reinforcer for Susanna and subsequently increased her responding significantly in high preference treatment.

DISCUSSION

Given the results of the reinforcer assessment across participants, the video-based format appears to have accurately identified high- and low-preference social stimuli that later functioned (high-preference) or failed to function (low-preference) as reinforcers. The high preference activities successfully increased the rate of responding across participants in comparison to baseline and low preference treatment sessions. In all three cases, the low preference conditions did not show a reinforcement effect. I would conclude, given these results, that the video-based preference assessment did indeed successfully identify a reinforcement hierarchy and can be used as a means of identifying similar reinforcing stimuli in future assessments.

The initially inconclusive results from the preference assessments for Cindy and Stevie present an interesting avenue for discussion. Although it cannot be determined why multiple activities were selected equally and preference was not differentiated in original assessments a number of speculations can be made. It is possible that the stimuli were initially chosen incorrectly and that the interviews with the participant's guardians were not accurate reports of high preference activities. This could mean that the initial results showed a lack of preference across stimuli and therefore responding was flat across several activities. On the other hand, it is also possible that the interview produced several activities that were equally reinforcing and that the activities identified could all be highly reinforcing when presented in the right context. This would also explain the mirrored responding across multiple activities. Either way, this would support the need of an assessment method to properly identify these preferences. It is also possible that the video representations of unknown individuals engaging in the activities were not

presented in the exact way or setting that the participants performed the activities in real life settings (i.e., different dance moves, different funny faces, etc.). Other critical features of the social stimuli presented may have been missing in the experimental setting. That is, the activities that may be preferred and non-preferred in real life settings may not function as such in a lab setting. Preference for social activities may vary person to person and setting to setting and may account for these inconclusive results when performed in a lab by the student researcher. Also, it should be noted, that the selection responses can only be viewed in comparison with the other stimuli presented. What is highly motivating in a real life context may have produced low responding in comparison to the other activities presented at the time. It is also possible that some stimuli, such as handshakes and thumb wars, were not as well known to the participants and, therefore, could have been chosen more or less often due to the novelty of the activity and not based on preference.

Upon further examination of the reinforcer assessment data for Susanna, there is a distinctive decrease in baseline responding during treatment conditions from original baseline sessions. During initial baseline conditions three out of seven sessions saw a response of 5 when no reinforcement was present. In contrast, during treatment sets, all baseline and low preference conditions showed one response across all sets. This could potentially be due to a contrast effect in which continued exposure or presentation of the task in conjunction with high preference conditions caused a change in her perception of the tasks and her responsibilities under those conditions. A similar effect could potentially also be seen in Cindy’s data as only one response was recorded across nine

initial baseline conditions and responding reached 6 and 7 during treatment baseline conditions.

These data suggest that video-based preference assessments may be useful in applied settings, at least when participants demonstrate the prerequisite skills necessary for their use. Currently preference assessments for tangible items are a staple in classroom and clinical settings, yet abstract reinforcers of any kind are incredibly difficult to assess using traditional methods. As a result, social stimuli are not always used effectively in teaching and reinforcement procedures. The use of social reinforcers in clinical settings can potentially increase social interactions with peers and other adults encourage spontaneous interaction and teach appropriate ways to approach and interact with others. This video-based format can be easily adapted to a variety of applied settings and can also be potentially be individualized to any participant. The results of the study suggest that this preference assessment format may be useful in clinical settings as an answer to the current deficit in applied settings.

One definite limitation of the study is the limited number of social activities that were used in the preference assessment. Only five activities were included in the video-assessment and the results were not a comprehensive analysis of preferred social interactions. Additionally, only the highest and lowest ranked preferred items were used in the reinforcement assessment. Because only the highest and lowest were used the integrity of the entire hierarchy cannot be fully analyzed.

Immediate access to the selected social stimuli was provided throughout the preference assessment. It is unknown what comparable results of the assessment would look like if this access was not permitted. This presents another limitation to this current

study. When assessing more complex activities and social stimuli using this video assessment immediate access may not be possible to immediately deliver. It is unclear if the results would replicate given these limitations in immediate presentation. This limits the conclusions and comparisons that can be drawn from this current study.

Another limitation, as discussed above, is the limited way in which the social reinforcement was delivered. The reinforcement was given only by the student researcher in a lab setting and it is unclear how these results would vary if a teacher, parent, sibling or other caregiver delivered this assessment.

Future research is definitely needed in this area. This is only the second study completed using this specific format and more research needs to be done to add validation to this assessment. Future research could potentially use more complex social activities than were used in this study, such as bike riding, swimming, flying a kite, and so forth. The nature of social reinforcement is complex and the degree to which an activity is reinforcing may vary across settings and people. Future research could examine and compare results across these environments to address this issue. Finally, six total participants were tested for participation in this study but three were unable to complete or score high enough on the pretest. Future research may include an adapted pre-assessment format or video matching pre-training to address this issue and expand the assessment to a wider array of participants. Additionally, some pragmatic issues with the initial video assessment could be addressed in future studies. Two computer screens were used throughout the assessment and each video clip had to be found and selected every time it was presented. This process was done one at a time so one video was being shown while the other one was being activated on the computer screen. Although this did not

seem to affect the results of the study, it was often difficult to find the videos and get them going in a timely manner. Future research could examine more advanced formatting and ways of presentation. Presenting the videos side by side on the same screen or programming the videos to play in the correct order you need them would be much more practical and effective for clinical application.

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APPENDICES

Appendix A

Parent Interview

What are your child's favorite social games/activities to do with others? - - - - - - -
What social activities does your child not enjoy doing with others? - - - - - - -
What social activities (if any) does your child engage in spontaneously or request? - - - - - - -

Please circle which of the following social activities you believe your child enjoys						
Head rub	Praise	Pat on the back	High Five	Hug	Interactive games *Ie. Thumb wars, Peak-a-boo* Activity:	Singing songs with you or peer
Reading books with you or peer	Hand shake	Dancing with you or peer	Soft pokes or tickles	Scaring you or peers	Pretend or Imaginative play with you or peer Activity:	Interactive Jokes *Knock Knock Jokes, Fill in the blanks etc.*

Appendix B

Paired Stimulus Preference Assessment

Client:_____ Assessed By:_____ Date:_____
Time:_____

Stimulus Items/Activities	Overall Rank (Largest percent is #1)
1	
2	
3	
4	
5	

Record item with corresponding item number: Circle Item selected:

1	2	1	2	3	4	5				
2	3	1	2	3	4	5	.	/8	100	
4	1	1	2	3	4	5				
3	2	1	2	3	4	5				
5	4	1	2	3	4	5				
4	3	1	2	3	4	5	.	/8	100	
1	4	1	2	3	4	5				
2	1	1	2	3	4	5				
4	5	1	2	3	4	5				
5	1	1	2	3	4	5	.	/8	100	
1	3	1	2	3	4	5				
4	2	1	2	3	4	5				
3	4	1	2	3	4	5				
5	3	1	2	3	4	5	.	/8	100	
1	5	1	2	3	4	5				
2	4	1	2	3	4	5				
5	2	1	2	3	4	5				
3	5	1	2	3	4	5	.	/8	100	
2	5	1	2	3	4	5				
3	1	1	2	3	4	5				
Times Selected:										

Appendix C

Reinforcer Assessment

Participant_____

Primary Data Collector_____ ☐
Secondary Data Collector_____ ☐
High Preference Stimulus_____
Low Preference Stimulus_____

High / Low / Baseline (Date)									
High / Low / Baseline (Date)									
High / Low / Baseline (Date)									
High / Low / Baseline (Date)									
High / Low / Baseline (Date)									

Appendix D

Phase 1 – Treatment Integrity

Participant_____
Date_____

Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Video played simultaneously?		**Video played simultaneously?**	
Activity presented right after it was chosen?		**Activity presented right after it was chosen?**	
	/2		**/2**
Total:	**%**		

Appendix E

Phase 2 – Treatment Integrity

Participant_____
Date_____
Treatment Condition?_____

Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Correct Activity Delivered?		**Correct Activity Delivered?**	
Reinforcement Immediately delivered?		**Reinforcement Immediately delivered?**	
Any other reinforcers delivered?		**Any other reinforcers delivered?**	
	/3		**/3**
Total:			