Fall 12-12-2019

Evaluating Correspondence Between Preference Assessments Requiring Motor and Vocal Responses

Marie Gilbert
mngilbert@rollins.edu

Evaluating Correspondence Between Preference Assessments Requiring Motor and Vocal Responses

A Thesis
By
Marie N. Gilbert

Submitted to the Faculty of the Department of Health Professions
at Rollins College in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF ARTS IN APPLIED BEHAVIOR ANALYSIS AND CLINICAL SCIENCE

July 2019
Winter Park, FL

Acknowledgements

It has been a pleasure to be a part of the Rollins College Applied Behavior Analysis and Clinical Science Program. Rollins has been my home for seven years and I am beyond grateful for the education and growth I have gained.

I want to first thank Dr. Michele Williams for her persistent support throughout these past three years and even more within this thesis. This research opportunity has taught me many invaluable lessons and Dr. Williams has provided support through each of them. I would also like to thank my other committee members Dr. Sarah Slocum-Freeman and Dr. Kara Wunderlich. Dr. Slocum-Freeman contributed to the research question proposed in this thesis along with insightful ways to answer the research question. Dr. Wunderlich provided critical edits to both the content and grammar of my work. Also, thank you Dr. Stephanie Kincaid for your inspirational passion for teaching.

I would also like to thank the faculty of the Rollins Psychology Department (including Dr. Alice Davidson, Dr. Jennifer Queen, and Dr. Andrew Luchner) all who helped me chase my dream of pursuing a master's degree. My undergraduate learning experiences fostered my love for educational growth and helped sparked my interest for applied behavior analysis.

Finally, I want to thank my family and Nick Seefeldt. Without their ruthless support and unwavering love, I would not have overcome the long and hard days of challenging growth. My Dad never allowed anything to get in my way of reaching for the stars, and I am forever grateful. To my Mom and Stepmom, thanks for your love throughout this journey. And to all my siblings, thank you for always having my back! You all made this possible. Nick, thank you for your love and for taking care of all other responsibilities while I gave my sweat and tears to this research. I am lucky to have such a great teammate!

Table of Contents

Page

ABSTRACT ……5

INTRODUCTION……...6

REVIEW OF LITERATURE……..7

Indirect Assessments/Surveys……..7
Direct Assessments……...8

STATEMENT OF THE PROBLEM…….13

METHOD……..14

Setting and Subjects……14
Procedures……...14

RESULTS……..18

DISCUSSION……21

REFERENCES…….....24

TABLES……28

FIGURES……...29

Abstract

Current practice is for reinforcers to be determined through systematic preference assessments prior to incorporating those items as reinforcers for behavior change programs. Historically, preference is typically determined by these assessments via a non-vocal response (i.e., subjects touch the item they prefer). It is possible in clinical settings, however, therapists simply ask an experienced learner what he or she "would like to work for" prior to commencing discrete trial training. It is unclear whether answers to these questions would align with subjects' non-vocal responses in a more formal assessment. The current study compared subjects' responses during two multiple-stimulus-without-replacement (MSWO) preference assessments and a "vocal nomination" assessment to determine if preferences were consistent across conditions. The first condition was a traditional MSWO with non-vocal responses, the second MSWO condition required a vocal choice response, and the third condition involved a vocal nomination, in which subjects were asked to vocally choose one item they "would like to work for." Results were similar to previous research that modified procedures from the original preference assessments, including using briefer assessments and vocal nominations, might not be a sufficient method for determining preference. Correspondence between the highest preferred item in the MSWOs and vocal nomination matched in 62% percent of trials. Possible future directions are discussed and recommendations for further investigating how often procedures such as the vocal nomination are used within clinical practice are provided.

Introduction

Interventions in applied behavior analysis (ABA) are primarily based on the use of reinforcement (Flora, 2004); however, to identify effective reinforcers we must first identify items preferred by the client. Preference assessments consist of systematic methods to determine stimuli that might serve as reinforcers (Pace, Ivancic, Edwards, Iwata, & Page, 1985) and can be used with neurotypical people and people with developmental disabilities alike. There are at least four standardized procedures for assessing preference that are commonly used by researchers: paired stimulus preference assessment (Fisher et al., 1992), multiple stimulus with and without replacement (DeLeon & Iwata, 1996), and free operant (Ortiz & Carr, 2000). Although the preference assessment research is well developed, it is unclear how much those research findings are being translated into practice.

For example, Canella, O'Reilly, and Lancioni (2005) reported that most of the research on preference assessments is not conducted with direct care providers within daily practices, but more often within controlled research. Tullis et al. (2011) conducted a meta-analysis of preference assessment research between 2002 and 2010. Of the 50 studies which qualified based on specific preference assessment criteria, only four focused on training staff to implement preference assessments. One of the barriers might be that the well-controlled and systematic procedures used in preference assessment research is considered to be too time- and labor-intensive for the practice setting. It might be wise, therefore, to compare the outcomes of traditional preference assessments with the outcomes of typical practices within clinical settings to see if they align. If possible, recommendations could then be made for procedures that would reduce the time to conduct preference assessments. Otherwise, if results fail to align, we know it

is necessary to encourage and train practitioners and caregivers to incorporate the traditional preference assessments more often in their everyday practices.

There have been several different modalities of preference assessments examined. For instance, Northup, Jones, Broussard, and George (1995) assessed the differences between a verbal choice stimulus procedure, direct observation, and a child nominated condition. Northup, George, Jones, Broussard, and Vollmer (1996) conducted similar research to determine if verbal choice procedures within preference assessments are effective. They utilized a vocally administered survey, a vocally administered paired stimulus preference assessment (PSPA) and a motor-choice PSPA. Furthermore, Cohen-Almedia, Graff, and Ahearn (2000) compared the hierarchies of preferred stimuli between tangible and verbal assessments. One unique contribution from Cohen-Almedia et al. was the correlation between the hierarchies of each preferences assessment type and IQ scores plus scores from the Pearson Picture Vocabulary Test-Revised (Dunn & Dunn, 1981), which demonstrates some qualities of vocal responses. Cohen-Alemida et al. discussed the implications of their results and concluded it might be important to determine when verbal assessments can be used, and if there are any prerequisite skills necessary before conducting vocal preference assessments.

Review of Literature

Indirect Assessments/Surveys

Indirect preference assessments are surveys or reports administered to caregivers or subjects themselves. Fisher, Piazza, Bowman, and Amari (1996) examined the correspondence in preferences between the results of an indirect assessment (the Reinforcer Assessment for Individuals with Severe Disabilities; RAISD) administered to caregivers and a common set of stimuli (Fisher et al., 1992) via a systematic assessment (a paired-stimulus preference assessment; PSPA). Six subjects in an inpatient unit for the assessment and treatment of severe

destructive behavior participated. Preferred items were used to find an effective reinforcer in a differential-reinforcement-of-alternative-behavior (DRA) treatment plan to reduce problem behaviors. First, the PSPA was utilized to compare all items with each other. Next, the items determined as most preferred were compared using a concurrent-operants reinforcer assessment. Overall, caregiver-informed items determined through the RAISD better predicted potential reinforcers than the items chosen from the natural environment.

In a similar study, Northup, George, Jones, Broussard, and Vollmer (1996) evaluated preferences based on an indirect preference assessment. They evaluated a vocally administered survey (in which participants were asked whether they liked 45 different activities and items from five different categories "a lot," "a little," or "not at all"), a vocally administered PSPA (in which participants were asked to state their choices between two items taken from five different categories), and a motor-choice PSPA (in which participants were asked to touch a picture of an item or activity from five different categories). They found the vocal and motor-choice assessments resulted in distinct differences between the ranked items compared to the survey. For example, in the vocal PSPA assessment, "escape" was chosen above 90% of the time and "activities" were chosen around 20% of the time for one subject. For the same subject, within the vocally administered survey both "escape" and "activities" were chosen between 70-75% of the time. Therefore, the indirect assessment ranked most items as highly preferred, and did not yield a hierarchy as did the vocal-choice and motor-choice PSPA assessments.

Direct Assessments

Single stimulus preference assessments. One of the earlier preference assessments measured a subject's interactions with a stimulus while other stimuli were unavailable (Pace, Ivancic, Edwards, Iwata, & Page, 1985). Following the presentation of each stimulus in multiple

trials, preferred items were defined as those approached in 80% or more of the trials, while non-preferred stimuli were categorized as items approached 50% of the time or less. This successive choice presentation can be helpful when a client has difficulty selecting items from an array (Hagopian, Rush, Lewin, & Long, 2001).

Paired stimulus preference assessments. Fisher et al. (1992) compared the Pace, Ivancic, Edwards, Iwata, and Page (1985) procedure to a procedure which presented stimuli from the original study's array in pairs in a "forced choice" procedure, or PSPA. During the PSPA, two stimuli were presented simultaneously; an approach (defined as touch or grabbing) to one stimulus resulted in access to that stimulus and removal of the other stimulus. Fisher et al.'s results indicated items chosen as highly preferred in the single-stimulus presentation did not remain highly preferred items when presented with another stimulus choice. Therefore, presenting stimuli in pairs better demonstrated a hierarchy of preferred and non-preferred items. However, this method of presentation required longer to conduct relative to the single-stimulus presentation because each stimulus must be compared with the other.

Although Fisher et al. (1992) used a motor-choice procedure, in which subjects identified preferred items by touching them, that is not the only possible method of administering a PSPA. For example, Northup, George, Jones, Broussard, and Vollmer (1995) conducted a verbal-stimulus PSPA in which subjects vocally reported which categories of items they would rather play with. The experimenter asked each subject, "Which would you rather play with, X or Y?," with X and Y representing two different categories of items. In this condition items were not present. This assessment presentation better predicted reinforcers than a child-nominated condition, in which each subject answered the question, "Of all the toys, which one is your favorite?" Cohen-Almeida et al. (2000) conducted a PSPA using two response modalities, motor

and vocal. For the majority of the subjects the highest preferred and lowest preferred item corresponded between the different assessments.

Multiple-stimulus preference assessments. Frequent sampling of preferences and reinforcers has been suggested to possibly enhance treatment effects (Mason, McGee, Farmer-Dougan & Risley, 1989) because of idiosyncratic shifts in client preferences (DeLeon & Iwata, 1996). Therefore, researchers have consistently examined preference procedures. Following the discovery of the PSPA, DeLeon and Iwata (1996) examined a multiple-stimulus-with-replacement preference assessment MSW; where an item is replaced back into the array so it may be selected again) compared with a multiple-stimulus-without-replacement preference assessment (MSWO; where the item may not be selected again). Results of these assessments were then compared to the results of a PSPA. For the majority of subjects, the highest-ranked stimuli in the MSW and MSWO matched the highest-ranked stimuli in the PSPA, the MSW produced the smallest total number of potential reinforcers, and the MSW and MSWO took about half the total time to complete compared to the PSPA. Carr, Nicholson, and Higbee (2000) later evaluated the original MSWO by DeLeon and Iwata using a briefer procedure consisting of three total trials rather than five. Reinforcer assessments following the brief MSWO confirmed the brief assessment was effective for determining highly preferred items that also functioned as reinforcers.

Daly et al. (2009) further demonstrated that different types of stimuli, such as activities represented by pictures, can be used as stimulus options in an MSWO preference assessment. A reinforcer assessment following the MSWO confirmed that the stimulus rankings (high, medium, and low) correlated with the work output subjects completed for each stimulus. Similar to Daly et al., Higbee, Carr, and Harrison (2000) used pictorial as well as tangible items in an MSW to

determine the feasibility and acceptability of pictorial representation as a possible preference assessment resource. The tangible-stimulus assessment procedure produced greater differentiation among items for two adults with developmental disabilities compared to when the stimuli were presented in picture form only. The tangible-items assessment also produced results that better predicted more potent reinforcers.

Research on preferences have shown that they can shift across time (Dyer, 1987; Roane, Vollmer, Ringdahl, & Marcus, 1998; Zhou, Iwata, Goff, & Shore, 2001). To measure these changes, DeLeon, Fisher, Rodriguez-Catter, Maglier, Herman, and Marherka (2001) compared the results of a single PSPA to those of a brief preference assessment that was conducted daily. The daily brief assessment was a one-trial MSWO (i.e., the entire stimulus array was presented only once). The highest chosen item in the PSPA and the highest chosen item in the daily MSWO only corresponded in 30% of assessments. When the highest preferred item established during the brief daily MSWO did not match the highest preferred item from the initial PSPA, a concurrent-operants reinforcer assessment was conducted with both items. Subjects generally worked more for the stimulus chosen in the brief daily MSWO than the stimulus chosen in the PSPA.

Free-operant preference assessments. Free-operant preference assessments are conducted when a researcher observes a subject's interactions with stimuli in the natural environment. Free-operant preference assessments often take less time than other stimulus preference assessments such as the PSPA. They are also especially useful when the subject displays a high frequency of problem behavior, because the assessment does not require demands (Roane, Vollmer, Ringdahl, & Marcus, 1998).

Ortiz and Carr (2000) compared a free-operant and an MSWO preference assessment. During the free-operant assessment, an experimenter told the subjects they could play with all the stimuli available. The experimenters recorded durations of individual subject's interactions with each stimulus. These results then were compared to the results of the MSWO preference assessment conducted earlier. Although the preferred items identified in the free operant and MSWO preference assessments were similar across subjects, the MSWO provided a larger number of potential reinforcers because it required forced exposure to all items, and in the free operant assessment a subject can potentially spend the entire observation period with only one item. Free-operant preference assessments typically identify preferred items relative to non-preferred items rather than identifying a hierarchy of preferred items, as in multiple-stimulus preference assessments (Ortiz & Carr, 2000).

Vocal nomination. Another way to establish preference is simply to ask the subject what they "want to work for." This is relevant to assess because it captures momentary preferences, only requires one item to be available, and is the most efficient assessment in terms of time to conduct. King (2016) evaluated the correspondence of a vocal nomination assessment and an MSWO with three elementary-aged subjects diagnosed with emotional disturbance. Seven stimuli were chosen by the subject through a ranked reinforcement survey. The vocal nomination assessment consisted of subjects vocally ranking each of the stimuli (i.e., from 1-7, with 1 being most preferred). Stimuli rankings served as preference scores. Subjects did not have access to stimuli following the vocal nominations. The stimuli used in the vocal nomination assessment were identical to the stimuli used in the MSWO preference assessment, however the stimuli rankings did not consistently correspondence between the vocal nomination and the MSWO. For one subject, correspondence between assessments was demonstrated for only one highly

preferred stimulus. The same two low-preferred stimuli were consistent between assessments. For another subject, an item ranked lowest preferred (7th) in the vocal nomination assessment was ranked highest preferred in the MSWO. The final subject ranked two different stimuli as highest preferred in each assessment. King observed the lack of access to stimuli following a ranking in the vocal nomination assessment might have contributed to the lack of correspondence between assessments.

Statement of the Problem

Currently there is evidence to support many different ways to determine preferences indirectly and directly, such as caregiver reports and surveys, PSPAs, MSWs, MSWOs, and free-operant assessments. However, there are barriers to administering these according to best practices in the clinical environment, as they are relatively time and labor intensive to administer frequently when individuals' access to services is already limited. Therefore, formal preference assessments might be administered once at the beginning of services being provided and not re-administered regularly, despite the best practice recommendations from researchers. Preferences can shift over time (Dyer, 1987; Roane, Vollmer, Ringdahl, & Marcus, 1998; Zhou, Iwata. Goff, & Shore, 2001) and, therefore, there is value to procedures that are manageable to run more often and provide information on client preferences. Another option to doing a vocal nomination survey (King, 2016) or one-trial MSWO (DeLeon et al., 2001) to save time is to ask the child to vocally nominate what they want to "work for." However, we do not know if that will accurately identify preferences. In the current study, we assessed whether there will be correspondence between the results of a motor-response MSWO, a vocal-response MSWO, and a vocal nomination assessment method in which the subject was asked "What do you want to work for?"

Method

Subjects and Settings

A total of 6 subjects participated in the study. All subjects were developing neurotypically. Their ages ranged between 3- and 5-years old. All subjects were enrolled in a preschool located on a college campus.

All sessions were conducted in an art classroom with a one-way mirror, video camera, and microphone. The same classroom was used throughout the study for each subject. The room contained two tables, multiple chairs, and typical art classroom materials and toys. Examples of materials and toys include paint, markers, paper, small manipulables (e.g., beads, blocks, wooden shapes, etc.), puzzles, board games (e.g., Mouse Trap), and toy trains.

Responses and Interobserver Agreement

During the MSWO-M when a subject made physical contact with an item, the observer recorded which stimulus was selected in terms of a rank order. Items chosen first were given a 1, items chosen second were given a 2, and so on until the sixth item was chosen, no items were chosen, or the subject vocally indicated he or she did not want to choose any. At the end of three consecutive trials the experimenter added the order in which a stimulus was chosen and divided by 3, the total number of trials. If there was a high level of variability between choices after three trials, two additional trials were conducted. After 5 trials the trials concluded and the same calculations were used, dividing the total numbers per stimulus by 5. In any trial, if the subject made physical contact with more than one item, access to the second was blocked and the first item was recorded as preferred. If the subject reached for more than one item at the same time, we blocked the response and told the subject to try again. If the subject grabbed a second

item while playing with the first item the item was removed from the subject and placed back in the array and the experimenter said, “Only one at a time.”

Reponses for the MSWO-V were similar to the MSWO-M, however, the subject’s response was recorded as the item chosen with a vocal response. All other hierarchy measurements were consistent with the MSWO-M.

Average rank was taken for each stimulus by dividing the number of times the stimulus was chosen by the total number of times the stimulus was available.

Pre-Assessment Interview

Prior to the initial experiment, the subject’s teachers were asked to complete the RAISD (Fisher, Piazza, Bowman, & Amari, 1996) to identify six toys the child has had exposure to. Of the six items, four of the items identified were chosen as “subject loves to play with” and the other two items were considered “subject does not really like.” We asked teachers to provide both categories of items in order to control for gathering a true hierarchy of preferences, rather than a hierarchy of preferred items. All toys were available in the direct preference assessments conducted later with each of the subjects.

Procedure

Subjects were randomly assigned to a subject number by shuffling the RAISD forms and numbering them 1 through 6. The order of the assessments for each subject was determined based on the sequence depicted in Table 1. Prior to the first session, each of 6 items was provided in an array in front of the child. The subject had time to interact with each item for 5-10 s. If the subject did not interact with an item within 5 s of presentation, the experimenter prompted the subject to, “Play with this.”

Motor MSWO (MSWO-M). Each session began with all items randomly arranged in a straight line on the table. Items were placed approximately 50 mm apart. Subjects sat approximately 30 cm in front of the items on the table. The experimenter prompted the student to, “Pick one to play with.” Once the subject physically selected an item he or she had 20 s to play with the item. The experimenter then said, “My turn” and took the item back. The item was removed from the array and the experimenter rearranged the item order. The item from the experimenter’s left was moved to the right, and the other items were moved so they were centered to the subject and equally spaced. The next presentation followed immediately. This sequence continued until all items were chosen or until the subject did not select an item within 15 s from the start of the trial or the child made a statement indicating they did not want to pick one. Following this sequence for all items, all the items were placed back on the table in a randomized order and the sequence started again for the next trial.

Vocal MSWO (MSWO-V). In this condition, sessions were conducted similarly to the prior condition, but the subjects were required to emit a vocal response rather than a motor response. For example, instead of reaching and grabbing he or she had to name the item and the experimenter gave the subject the item. Similarly to the MSWO-M, items were approximately 30 cm in front of the subject. If subjects attempted to grab an item, the experimenter blocked the motor response, and prompted the child to “Tell me which one you want.”

Vocal nomination. During the vocal nomination condition, subjects were asked, “What do you want to work for?” The same items from the MSWOs were visible on the table. This was done to control for other items being selected and thus not being able to compare with the MSWOs. We also wanted to help mirror the natural environment as closely as possible.

To begin the trial, nineteen blocks and a clear plastic bin were placed on a table in front of the subject. During baseline, the experimenter told the subject, “You can put as many blocks away as you would like, or you do not have to.” No social consequences were provided for putting the blocks away in the bucket. The experimenter recorded how many blocks the subjects put in the bucket for 1 min. If a child attempted to put more than one block in the bucket at a time, the instruction, “Only one block at a time” was given. For Subject 4, who repeatedly placed multiple blocks in at a time, all except for one block that was placed in one instance was removed and the instructions were repeated.

In the vocal nomination condition, the experimenter asked the subject, “What do you want to play with for doing work?” Whatever item the subject vocally chose was recorded as the vocal nomination. The experimenter then told the subject, “You can put the blocks away or you don’t have to. If you put the blocks away I will give you a token for each block. Tokens mean more time with (whichever item they chose).” These conditions were run in a reversal design for between three to five trials each. The block procedure was included to give the subject the opportunity to access the item they vocally nominated and to simulate a clinical environment.

Interobserver Agreement (IOA)

Customized data sheets were used to record subject selections. Data sheets were prepared according to assessment type. For all sessions, the experimenter also served as an observer. For 33% of the sessions, a second observer recorded data from a video of the session (or from behind a one-way mirror during the session for subjects whose caregivers did not consent to video recordings). Agreements between observers were measured with trial-by-trial IOA (Cooper, Heron, & Heward 2007). Each experimenter recorded selections by the subjects in each trial. Interobserver agreement was computed by dividing the number of times the experimenters

agreed on the subject's choice by the total number of trials observed and then multiplying that total by 100 to obtain a percentage. Observers agreed on all trials, yielding an IOA of 100% for the preference assessments. For the vocal nomination assessments, IOA was calculated for 50% of trials. Interobserver agreement was determined by comparing recordings of vocal nomination between the observer and researcher. Observers agreed on all trials, yielding an IOA of 100% for the vocal nomination assessments.

Treatment Integrity

Treatment integrity was calculated for 30% of sessions across assessments. A task list was created for the behaviors necessary to conduct assessments appropriately. For example, for the MSWOs the task list included items such as delivering the appropriate discriminative stimulus, rotating the stimuli, and removing the stimulus from the array that was last chosen. An observer (separate from the experimenter) recorded data from videos of the sessions. Treatment integrity was calculated by dividing the number of times a task list item was conducted by the total number of task list items. Treatment integrity was 98%.

Results

The results of the MSWO-M, MSWO-V, and vocal nomination assessments are displayed in Figures 1 and 2 below. Three out of six subjects demonstrated correspondence for highest preferred items (top 2 items) across the MSWO-M and MSWO-V. Four out of six subjects demonstrated correspondence for the highest preferred item (top item) across the MSWO-M and MSWO-V. Three out of six subjects demonstrated correspondence for the lowest ranked item across the MSWO-M and MSWO-V. Two of the three subjects that demonstrated correspondence for highest preferred items also demonstrated correspondence for the lowest preferred item.

Only one subject demonstrated correspondence for the highest ranked items (top 2 items) across the MSWO-M and vocal nomination. Three subjects demonstrated correspondence for the highest preferred item (top item) across the MSWO-M and vocal nomination. It was difficult to compare lowest ranked item correspondence, because there were many items not chosen within the vocal nomination trials.

Discussion

These results do not align with previous research that suggest preferences are demonstrated consistently across preference assessments (DeLeon & Iwata, 1996), but they do align with more recent research that examined modifications of current assessments for determining preference (DeLeon et al. 2001; King, 2016). The vocal nomination assessment method was conducted to assess if a method that requires significantly less time than an MSWO is accurate in reporting preferences. Only one of six subjects demonstrated correspondence for mostly all stimuli (within 2 rank positions for low preferred items) across all three assessments.

From a clinical perspective, it is valuable to know which items are highly preferred (DeLeon & Iwata, 1996) because those items might better function as reinforcers. Overall, the vocal nomination trials corresponded with items identified as high-preferred (62% of trials). This suggests vocal nomination might be a possible indicator of a highly preferred item. Of the other 38% of trials, 24% of choices corresponded with at least one of the MSWOs. It is difficult to determine the significance of the 24% of choices that corresponded with one of the MSWOs, because there are no measures for which MSWO is a more accurate representation of preference when the two assessments do not match. The final 14% of choices in the vocal nomination method did not correspond with a highly preferred item in either assessment.

One consideration of the current vocal nomination assessment method is items used in the MSWO-M and MSWO-V were placed near the student during the vocal nomination trials. That is, during the vocal nomination assessment the same items from the MSWOs were visible on the table. One-way future studies might assess for the latter is to measure correspondence between items selected for an MSWO (by indirect measures or direct observation) and running a vocal nomination assessment in the natural environment. Another consideration for the structure of the vocal nomination assessment was to include access to stimuli following the vocal nomination, in order to simulate the natural environment. Therefore, we included the opportunity to earn the stimulus chosen.

One possible limitation of the study is the total time to conduct all assessments. For each subject, sessions were conducted on different days; however, sessions were not conducted consecutively across days. Due to the limited available time to conduct research at the preschool and the inherent nature of absences, sessions were all conducted within a two-week time frame. We know from previous research preferences can shift (Dyer, 1987; Roane, Volmer, Ringdahl, & Marcus, 1998; Zhou, Iwata, Goff, & Shore, 2001), and this might account for some of the lack of correspondence related to stimulus preference across assessments for the subjects. The items used in each assessment were kept in a closed closet and the subjects did not have access to the items, to control for satiation effects. However, it is possible subjects had access to similar items throughout the school day. For example, the scissors used in the study remained the same and were not available to the subjects; however, scissors are a common item in a preschool classroom and might have been used throughout the two-week time period. It was not possible to remove similar to the items used in the study from the typical environment. This also could have caused

variation due to establishing operations of deprivation and satiation (Gottschalk, Libby, & Graff 2000).

A few subjects demonstrated variability within the MSWO assessments, which does not align with typical findings from an MSWO. Subject 3 chose the baby doll first in 2 out of the 5 trials of the MSWO-V. In both instances, she hit herself in the head with the baby doll. For this instance, order of choice could have been due to learning history rather than preference. It is unclear if the subject had a learning history of the automatic sensation hitting her head with the baby provided, or if there was a learned history of access to attention for that behavior. Either of these learning histories could have impacted the order of choice for the baby doll.

Future research should also assess more globally how often the vocal nomination assessment method is used in practice, and if it is used in what form (i.e., are the items visible, within close proximity, or out of sight?). This will help to better understand the vocal nomination assessment method and help further evaluate the reliability of such measure.

References

Canella, H. I., O'Reilly, M. F., & Lancioni, G. E. (2005). Choice and preference assessment research with people with severe to profound developmental disabilities: A review of the literature. *Research in Developmental Disabilities, 26(1),* 1-15. doi: 10.1016/j.ridd.2004.01.006

Carr, J. E., Nicolson, A. C., & Higbee, T. S. (2000). Evaluation of a brief multiple-stimulus preference assessment in a naturalistic context. *Journal of Applied Behavior Analysis, 33*, 353-357. doi:10.1901/jaba.2000.33-353

Cohen-Almeida, D., Graff, R. B., & Ahearn, W. H. (2000). A comparison of verbal and tangible stimulus preference assessments. *Journal of Applied Behavior Analysis, 33*(3), 329-334. doi:10.1901/jaba.2000.33-329

Daly, E. J., Wells, N. J., Swanger-Gagne, M. S., Carr, J. E., Kunz, G. M., & Taylor, A. M. (2009). Evaluation of the multiple-stimulus without replacement preference assessment method using activities as stimuli. *Journal of Applied Behavior Analysis, 42,* 563-574. doi:10.1901/jaba.2009.42-563

DeLeon, I. G., Fisher, W. W., Rodriguez-Catter, V., Maglier, K., Herman, K., & Marherka, J. M. (2001). Examination of relative reinforcement effects of stimuli identified through pretreatment and daily brief preference assessments. *Journal of Applied Behavior Analysis, 34,* 463-473. doi:10.1901/jaba.2001.34-463

DeLeon, I. G., & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. *Journal of Applied Behavior Analysis, 29,* 519-533. doi:10.1901/jaba.1996.29-519

Dunn, M., & Dunn, L. M. (1981). Peabody picture vocabulary test-revised. Circle Pines, MN: American Guidance Service.

Dyer, K. (1987). The competition of autistic stereotyped behavior with usual and specially assessed reinforcers. *Research in Developmental Disabilities, 8,* 607-626. doi:10.1016/0891-4222(87)90056-4

Flora, S. R. (2004). The power of reinforcement. Albany: State University of New York Press.

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with a systematic choice assessment to enhance reinforcer identification. *American Journal of Mental Deficiency, 101*(1), 15-25.

Fisher, W., Piazza, C. C., Bowman, L. G., Hagopian, L. P., Owens, J. C., & Slevin, I. (1992). A comparison of two approaches for identifying reinforcers for persons with severe and profound disabilities. *Journal of Applied Behavior Analysis*, *25,* 491-498. doi:10.1901/jaba.1992.25-491

Gottschalk, J. M., Libby, M. E., & Graff, R. B. (2000). The effects of establishing operations on preference assessment outcomes. *Journal of Applied Behavior Analysis, 33,* 85-89. doi:10.1901/jaba.2000.33-85

Hagopian, L. P., Rush, K. S., Lewin, A. B., & Long E. S. (2001). Evaluating the predictive validity of a single stimulus engagement preference assessment. *Journal of Applied Behavior Analysis, 34,* 475-485. doi:10.1901/jaba.2001.34-475

Higbee, T. S., Carr, J. E., & Harrison, C. D. (2000). Further evaluation of the multiple stimulus preference assessment. *Research in Developmental Disabilities, 21,* 61-73. doi:10.1016/S0891-4222(99)00030-X

King, S. A. (2016). Multiple-stimulus without replacement preference assessment for students at risk for emotional disturbance. *Journal of Behavioral Education, 25,* 431-454. doi: 10.1007/s10864-016-9256-1

Mason, S. M., McGee, G. G., Farmer-Dougan, V., & Risley, T. R. (1989). A practical strategy for ongoing reinforcer assessment. *Journal of Applied Behavior Analysis, 22,* 171-179. doi:10.1901/jaba.1989.22-171

Northup, J. (2000). Further evaluation of the accuracy of reinforcer surveys: A systematic replication. *Journal of Applied Behavior Analysis, 33,* 335-338. doi:10.1901/jaba.2000.33-335

Northup, J., George, T., Jones, K., Broussard, C., & Vollmer, T. (1996). A comparison of reinforcer assessment methods: The utility of verbal and pictorial choice procedures. *Journal of Applied Behavior Analysis, 29,* 201-212. doi:10.1901/jaba.1996.29-201

Northup, J., Jones, K., Broussard, C., & George, T. (1995). A preliminary comparison of reinforcer assessment methods for children with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 28(1),* 99-100. doi: 10.1901/jaba.1995.28-99

Ortiz, K. R., & Carr, J. E. (2000). Multiple stimulus preference assessments: A comparison of free-operant and restricted operant format. *Behavioral Intervention, 15,* 345-353. doi:10.1002/1099-078x

Pace, G. M., Ivancic, M. T., Edwards, G. L., Iwata, B. A., & Page, T. J. (1985). Assessment of stimulus preference and reinforcer value with profoundly retarded individuals. *Journal of Applied Behavior Analysis, 18,* 249-255. doi:10.1901/jaba.1985.18-249

Roane, H. S., Vollmer, T. R., Ringdahl, J. E., & Marcus, B. A. (1998). Evaluation of a brief stimulus preference assessment. *Journal of Applied Behavior Analysis, 31,* 605-620. doi:10.1901/jaba.1998.31-605

Tullis, C. A., Cannella-Malone, H. I., Basbigill, A. R., Fleming, C. V., Payne, D., & Wu, P. (2011). Review of the choice and preference assessment literature for individuals with severe to profound disabilities. *Education and Training in Autism and Developmental Disabilities, 46(4),* 576-595.

Zhou, L., Iwata, B. A., Goff, G. A., & Shore, B. A. (2001). Longitudinal analysis of leisure-item preferences. *Journal of Applied Behavior Analysis, 34*(2), 179-184. doi:10.1901/jaba.2001.34-179

Table 1
Order of conditions per subject

Subjects	Order of Conditions		
	1	2	3
1, 6	MSWO Motor	MSWO Vocal	Vocal Nomination
2, 4	MSWO Vocal	Vocal Nomination	MSWO Motor
3, 5	Vocal Nomination	MSWO Motor	MSWO Vocal

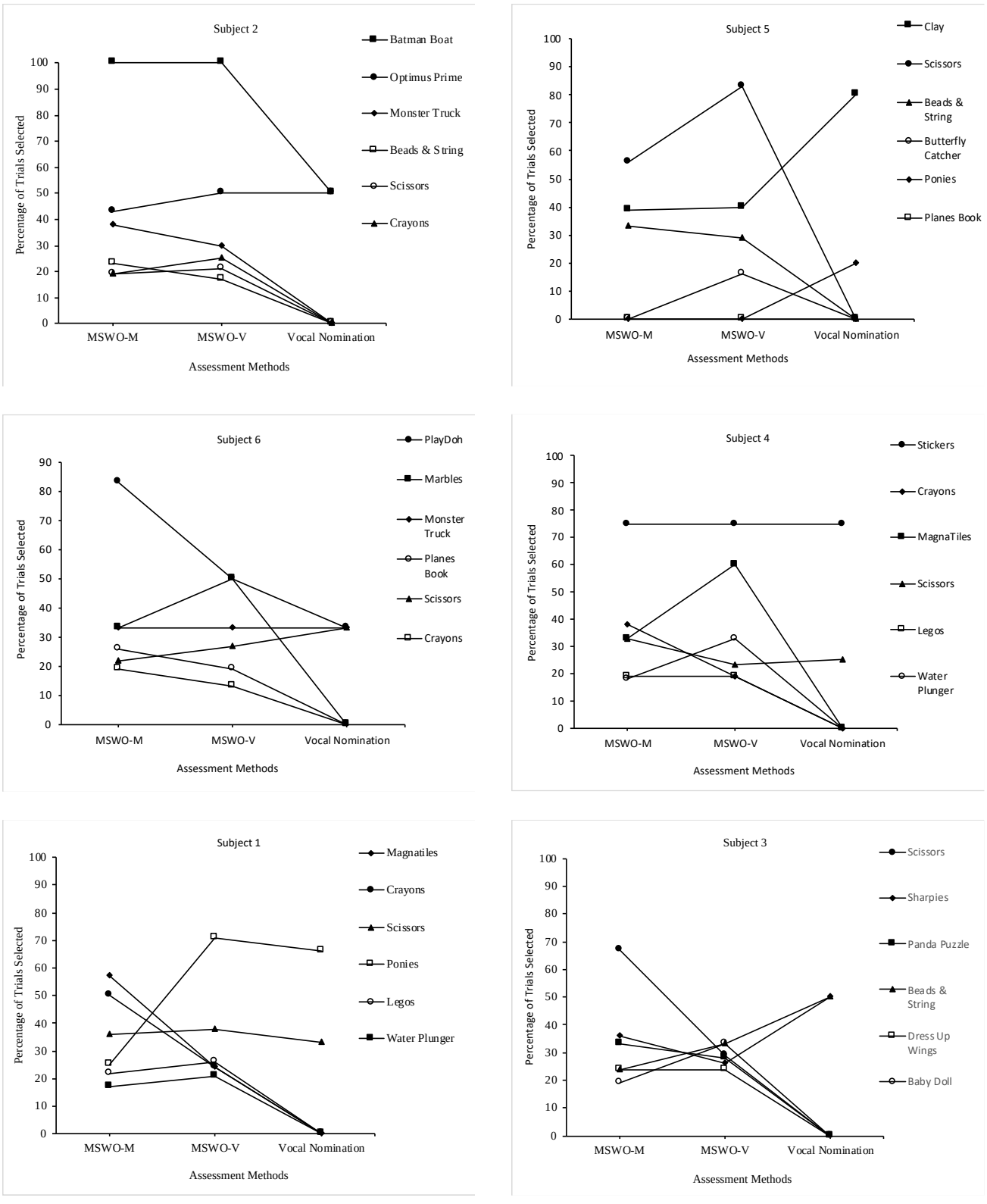

Figure 1. Percentage of stimuli selected.

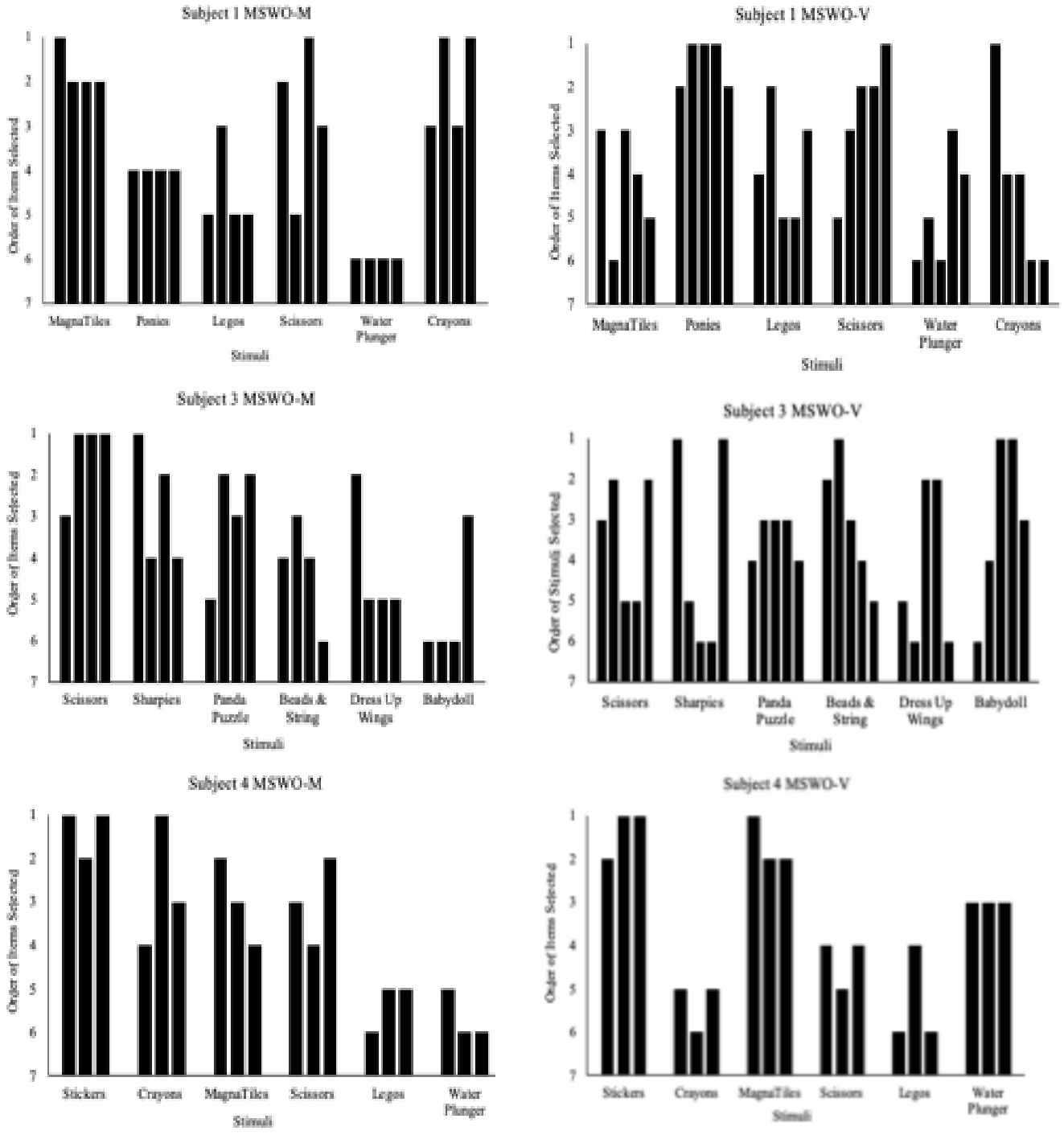

Figure 2. Order of items selected.