A COMPARISON OF THE EFFECTS OF DESCRIPTIVE PRAISE AND GENERAL PRAISE ON ACQUISITION IN YOUNG CHILDREN

By

Bertilde U. Kamana
B.Sc., Western Michigan University, 2012

Submitted to the graduate degree program in Applied Behavioral Science and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Master of Arts.

_____

Chair: Claudia L. Dozier, Ph.D.

_____

Florence D. DiGennaro Reed, Ph.D.

_____

Pamela L. Neidert, Ph.D.

Date Defended: 31 October 2016

The Thesis Committee for Bertilde U. Kamana
certifies that this is the approved version of the following thesis:

A COMPARISON OF THE EFFECTS OF DESCRIPTIVE PRAISE AND GENERAL PRAISE ON ACQUISITION IN YOUNG CHILDREN

_____

Chair: Claudia L. Dozier, Ph.D.

Date Approved: 31 October 2016

Abstract

Previous research comparing the effects of descriptive praise versus general praise on the acquisition of skills has yielded mixed outcomes. That is, some studies have found descriptive praise to be more effective (Fueyo, Saundergras, & Bushell, 1975), whereas others have found negligible differences between the two types of praise (e.g., Polick, Carr, & Hanney, 2012). The purpose of the current study was to replicate and extend previous research in this area by (a) attempting to isolate the effects of the different types of praise (i.e., without the use of other procedures such as error correction, within-session prompts, or additional reinforcers such as tokens) for teaching letters, phonemes, and sight words to preschool children and (b) determining child preference for the different types of praise. Overall results replicated previous research by showing negligible differences between descriptive praise and general praise. In fact, praise, regardless of the type, was not a robust procedure for acquisition. Additionally, preference evaluation results showed that only 4 out of 7 participants preferred praise, and of these, two participants preferred descriptive praise, and two participants preferred general praise. Thus, preferences were idiosyncratic with respect to preferences for praise across participants.

Key Words: acquisition, descriptive praise, general praise, letters, phonemes, sight-words, typically-developing children

Acknowledgements

To my major advisor, Dr. Claudia L. Dozier, thank you for your feedback, support, and guidance throughout the conduction of this study; you are a great example of an extraordinary researcher. To my current and former lab mates, thank you for conducting sessions with me and providing me with valuable feedback throughout this process; you have made my graduate school experience everything it should be. Finally, to my friends and family, thank you for your never-ending support and encouragement.

Table of Contents

Abstract iii

Acknowledgements iv

Introduction 1

Method 6

Participants and Setting 6

Response Measurement, Procedural Integrity, Interobserver Agreement, and Data Analysis 7

Procedures 10

Experimental design. 13

Baseline. 16

Exposure. 16

General praise 17

Descriptive praise 17

Neutral statements 17

Edible 17

Preference evaluation 17

Results 19

Discussion 30

References 39

Figures 45

Tables 55

Appendix A 56

Appendix B 57

Praise has been defined as the expression of approval or admiration for a particular behavior (Brophy, 1981; Morris & Zentall, 2014). Several research studies have reported changes in behavior when praise alone or praise in conjunction with other consequences have been delivered contingent on behavior (e.g., DiCarlo & Reid, 2004; Goetz, Holmberg, & LeBlanc, 1975; Goetz & Baer, 1973; Hall, Lund, & Jackson, 1968; McLaughlin, 1992; Sigafoos, Doss, & Reichle, 1989). Thus, praise is often recommended for teaching and changing the behavior of young children (Casey & Carter, 2016; Moore-Partin, Robertson, Maggin, Oliver, & Wehby, 2010). Praise may be categorized as either general or descriptive; general praise refers to the mere affirmation of correctness of an individual's response (Brophy, 1981), whereas descriptive praise, or behavior-specific praise (BSP), refers to a statement in which a certain aspect of an individual's behavior is explicitly identified (Polick, Carr, & Hanney, 2012).

Although general praise and descriptive praise are both recommended for increasing behavior in behavioral intervention programs and education environments (Gable & Shores, 1980; Casey & Carter, 2016), several researchers have suggested that descriptive praise is more appropriate than general praise for teaching or increasing various skills (Brophy, 1981; Burnett, 2010; Burnett & Mandel, 2010; Hawkins & Heflin, 2011; Stormont, Lewis, & Covington-Smith, 2005). Specifically, these and other researchers have suggested that general praise is unlikely to be as effective as descriptive praise because general praise lacks a specification of the behavior, which makes is less effective for learning. Thus, descriptive praise is often recommended over general praise for teaching and intervention in both typically developing children (National Association for the Education of Young Children [NAEYC], 2009) and children diagnosed with

intellectual and developmental disabilities (IDD; Sandall, Hemmeter, Smith, & McLean, 2005).

Several studies have evaluated the use of descriptive praise for increasing appropriate behavior such as on-task behavior (e.g., Allday, Hinkson-Lee, Darch, Craig, & Gersten, 1985; Fullerton, Conroy, & Correa, 2009; Hudson, & Neilson-Gatti, 2012; Hemmeter, Snyder, Kinder, & Artman, 2011; Sutherland, Wehby, & Copeland, 2000) and decreasing problem behavior such as disruptive behavior (e.g., Haydon & Musti-Rao, 2011; Reinke, Lewis-Palmer, & Martin, 2007). For example, Sutherland et al. (2000) evaluated the effects of descriptive praise on children's on-task behavior by training teachers to use descriptive praise with nine children between the ages of 10 and 11. Results of this study suggested that when teachers' use of descriptive praise increased, students' on-task behavior also increased. Additionally, Allday et al. (2012) trained teachers to use descriptive praise in an attempt to increase on-task behavior of students at risk for emotional and behavioral disorders (EBD). Results showed that as teachers' use of descriptive praise increased, children's on-task behavior also increased. However, results of this study also showed a decrease in reprimands. Therefore, it is unclear whether an increase in descriptive praise, a decrease in reprimands, or both resulted in behavior change. Although these and other studies showed that descriptive praise was effective for increasing or decreasing various aspects of child behavior, there are several limitations. First, data from these studies do not indicate whether the descriptive aspect of praise was necessary to change behavior. That is, these studies report a change in behavior due to an increase in descriptive praise—however, it could be that an increase in teacher-child interaction, regardless of whether that interaction included the descriptive

aspect of praise, influenced behavior change. Second, several of these studies (e.g., Haydon & Musti-Rao, 2011; Hemmeter et al., 2011; Reinke et al., 2007; Sutherland et al., 2000) report behavior change following an increase in descriptive praise; however, data also show that general praise increased. Therefore, it is possible that a simple increase in praise, regardless of the type, resulted in behavior change.

Several researchers have attempted to address limitations of these studies by evaluating the effects of descriptive praise by comparing it directly to general praise. In comparing the effects of descriptive praise and general praise for increasing appropriate behavior, some studies have shown that descriptive praise was more effective, (e.g., Chalk & Bizo, 2004; Fueyo, Saundergas, & Bushell, 1975), whereas others have shown negligible differences (e.g., Polick et al., 2012; Stevens, Sidener, Reeve, & Sidener, 2011). Studies that have shown descriptive praise to be more effective have had some notable limitations. For example, Chalk and Bizo (2004) trained two teachers to use descriptive praise and two other teachers to use general praise in their respective classrooms in order to increase student on-task behavior. Results showed that the classrooms with higher levels of on-task behavior were the classrooms in which teachers were trained to use descriptive praise. A major limitation of this study, however, is that there were other differences between descriptive praise and general praise. That is, descriptive praise statements were reported to have been longer in duration and contained more words than the often-brief general praise statements. Additionally, Fueyo et al. (1975) compared descriptive praise with corrections to general praise alone in teaching swimming skills to young adults with IDD. Participants included two boys and two girls between the ages of 13 and 17 years, and the dependent variables were the percentage of

correctly performed steps of the backstroke and sidestroke swimming styles. Results for all participants showed that descriptive praise with corrections was more effective than general praise alone for increasing correctly performed steps of the two swimming styles. However, the major limitation of this study was that the results could have been largely due to the use of corrections in the descriptive-praise condition, which the general-praise condition lacked. Therefore, although these studies reported that descriptive praise was more effective than general praise for changing behavior, more research addressing some of these major limitations was warranted.

Some studies that have compared the effects of descriptive praise and general praise have reported negligible differences between the two types of praise (e.g., Polick et al., 2012; Stevens et al., 2011). In an attempt to address the limitation of Fueyo et al. (1975), Stevens et al. (2011) compared the effects of descriptive praise (e.g., "you said avocado, that's right!") and general praise (e.g., "you did it, that's right!) while keeping other variables (e.g., additional procedures) constant across conditions. Specifically, the experimenters compared the effects of descriptive praise plus tokens, general praise plus tokens, and tokens alone on the acquisition, generalization, and maintenance of tacts in two children diagnosed with autism spectrum disorder. Across all sessions, praise was delivered with a token for correct responding. In the control condition (tokens alone), tokens were delivered alone for correct responding. Results of this study showed negligible differences across conditions for the acquisition of tacts. Similarly, generalization and follow-up data showed that both participants maintained high levels of correct responding across all conditions. Given that the tokens-only condition produced similar results as the descriptive- and general-praise conditions, it may be suggested that

praise may not have been necessary and tokens were likely the variable influencing responding.

Most recently, Polick et al. (2012) attempted to address the limitation of Stevens et al. (2011) by not including supplemental reinforcement (e.g., tokens). Polick et al. (2012) compared the effects of descriptive praise (e.g., "great job saying cow!") and general praise (e.g., "great job!") on the acquisition of intraverbal behavior by two children diagnosed with autism. Conditions included descriptive praise, general praise, and neutral statements (i.e., non-praise statements such as a transition statement like, "Let's see what's next"). All conditions included least-to-most prompting for incorrect responses. Results of this study showed comparable outcomes of the acquisition of intraverbals between descriptive and general praise, with descriptive praise producing somewhat faster acquisition. However, it is possible that the prompts used in the study influenced the outcomes of the current study. Therefore, the question still remains as to whether descriptive and general praise alone may have different effects when used for acquisition.

In summary, studies comparing descriptive-and-general praise have produced differing results, and those that have shown descriptive praise to be more effective (e.g., Fueyo et al., 1975) have had several methodological limitations. A major limitation includes the use of additional procedures (e.g., corrections) that likely influenced the outcomes. Additionally, of the studies that found comparable outcomes between descriptive-and-general praise (e.g., Polick et al., 2012; Stevens et al., 2011), a major limitation was the use of additional procedures such as token economies and prompts, making it possible that the differences between the two types of praise were masked. In

addition to these limitations, most studies that compared descriptive-and-general praise did not control for several other variables that may have influenced the results, such as the number of words used in the praise statements and the amount of variability in different praise statements within and across sessions or conditions. Finally, previous researchers have not evaluated child preference across the two types of praise, which may be important for determining the type of praise to use in educational and intervention environments to increase the preference of those interventions. Therefore, the purpose of the current study was to replicate and extend previous research on the comparison of descriptive praise and general praise on the acquisition of skills (i.e., reading letters, phonemes, and sight-words) in preschool children. Specifically, we isolated the influence of the different types of praise by excluding supplemental reinforcement and within-session prompting procedures across the different conditions. In addition, we controlled for the length of the different praise statements across conditions and the variability of praise statements within sessions and across conditions. Finally, we assessed individual child preference for the different types of praise.

Method

Participants and Setting

Participants were eight typically developing preschool-age children (3-5 years) who attended a university-based child development center at the University of Kansas. All participants were able to follow simple multi-step instructions (e.g., "sit down and put your hands in your lap") as reported by the supervisors in their classroom. In addition, all participants were native English speakers (i.e., the English language was their primary means of communication) as reported by their caregivers and classroom supervisors.

Trained graduate students served as experimenters and conducted sessions in a session room equipped with a table, chairs, and relevant session stimuli. All sessions were conducted in session blocks, and each session block contained three or four conditions (i.e., one of each type of condition), depending on the participant. Except for baseline, in which we sometimes conducted several session blocks (range, 1-6), during all other phases, only one session block was conducted per day.

Response Measurement, Procedural Integrity, Interobserver Agreement, and Data Analysis

Trained graduate and undergraduate observers collected data using a paper and pencil data collection method. The primary dependent variable was the cumulative number of mastered task items (depicted on flashcards). The criteria for a task item to be considered mastered was the participant correctly reading the flashcard all three times the experimenter presented it in a single session across two consecutive sessions. Thus, data collectors recorded correct and incorrect responses during all sessions. A response was scored as correct if the participant accurately and independently read the flashcard within 5 s of presentation. A response was scored as incorrect if the participant did not accurately and independently read the flashcard within 5 s. That is, an incorrect response was scored if the participant's vocal response did not match the stimulus displayed on the flashcard (including mispronunciations), the participant said, "I don't know," or the participant failed to respond within 5 s of presentation.

Data collectors also scored the experimenter's implementation of session consequences for correct and incorrect responding across phases and conditions. That is, data collectors recorded whether descriptive praise, general praise, neutral statements, or no consequence was delivered following participant responding. Descriptive praise

statements included statements that explicitly stated the behavior being performed such as, “Nice job saying *Cat*!” General praise statements included statements that affirmed correctness in responding such as, “Wow, you did it!” Neutral statements included transition statements such as, “Let’s keep moving along!” See Table 1 for the complete list of the different statements that were used in the descriptive praise, general praise, and neutral statements conditions. We calculated procedural integrity of the experimenter’s delivery of the correct consequence during at least 30% of sessions across participants. A correct consequence was scored on a particular trial if the experimenter delivered the consequence that was programmed to be delivered in that session for correct and incorrect participant responding. For example, if the participant responded incorrectly during any session, then a correct experimenter response was scored if the experimenter did not deliver any consequence, whereas if the participant responded correctly on a trial in a descriptive-praise session, then a correct experimenter response was scored if the experimenter delivered a descriptive-praise statement. Across all participants, procedural integrity for session consequences for correct and incorrect responding was 100%.

A second independent observer collected data for a minimum of 30% of sessions across all conditions and phases for each participant. Interobserver agreement (IOA) was determined on a trial-by-trial basis by comparing the records of the two independent data collectors. An agreement for a particular behavior on a given trial was defined as both observers scoring the same response. For example, an agreement was scored if both observers recorded a correct or incorrect response on a given trial. IOA was calculated by dividing the number of agreement trials by the total number of trials, and multiplying the result by 100%.

IOA was calculated for at least 50% of sessions across participants. IOA was calculated for 76% of sessions for Emma, and mean agreement across all sessions and phases was 99.8% (range, 85%-100%). IOA was calculated for 62% of sessions for Blake, and mean agreement across all sessions and phases was 99.8% (range, 67% - 100%). IOA was calculated for 59% of sessions for Maddy, and mean agreement across all sessions and phases was 99.4% (range, 89% -100%). IOA was calculated for 58% of sessions for Xander. And mean agreement across all sessions and phases was 99.9% (range, 89% -100%). IOA was calculated for 53% of sessions for Frank, and mean agreement across all sessions and phases was 100%. IOA was calculated for 79% of sessions for Ali, and mean agreement across all sessions and phases was 99.9% (range, 89% -100%). IOA was calculated for 59% of sessions for Jesse, and mean agreement across all sessions and phases was 100%. IOA was calculated for 65% of sessions for Mario, and mean agreement across all sessions and phases was 99.9% (range, 89% - 100%). For the very few sessions in which IOA was below 80%, observers were retrained on the definitions of each behavior to ensure understanding and to minimize observer drift. For example, IOA for one of Blake's sessions was low (i.e., 67%). This was due to trials in which one of the sight words was mispronounced (e.g., pronouncing *run* as *ran)*. Data collectors were given feedback and trained to record all mispronunciations of words as incorrect.

Following the completion of the study, we analyzed individual participant data with respect to single-session outcomes, particularly because we observed that some participants were responding correctly within session but were not necessarily meeting the two-session mastery criteria. Therefore, we analyzed and re-graphed the data using

the number of task items that the participant got correct all three times each task item was presented in a single session. That is, if the participant got it correct all three times, then that task item was counted as correct for that particular session. However, if the participant got a task item incorrect one or more times, then the task item would not be included as correct for that session.

Procedures

Pretest. Prior to the study, experimenters conducted a pretest with each participant to determine unknown lowercase letters, uppercase letters, phonemes, or sight-words to be used as acquisition items in the study. All pretest stimuli were presented on flashcards with a white background. In pretest sessions, the experimenter presented 26 lowercase letters and uppercase letters, as well as various phonemes and pre-kindergarten sight-words (obtained from the preschool Dolch Word List), depending on the participant. That is, if the participant demonstrated that letters were known, then the experimenter presented phonemes in the next pretest. Similarly, if the participant demonstrated that phonemes were known, then the experimenter presented sight-words in the next pretest. Pretests were conducted across various sessions that were less than 5 min in duration and included approximately 25 flashcards in each session. During the pretest, the experimenter instructed the participant to do their best at reading the flashcards and presented each flashcard to the participant. A response was scored as known if the participant accurately and independently read the item presented on the flashcard. A response was scored as unknown if the participant did not accurately and independently read the item presented on the flashcard, said, “I don’t know,” or failed to respond. The experimenter did not deliver consequences for correct or incorrect

responding but delivered intermittent praise (e.g., "Nice job looking at the cards!") on a variable interval (VI) 1 min schedule for sitting appropriately and attending to the flashcards. The experimenter removed flashcards that the participant read correctly during the first pretest and presented the flashcards the participant read incorrectly in a second pretest session. Flashcards that the participant read incorrectly during both pretest sessions were considered unknown and used as task items in various conditions of the study. The experimenter initially determined approximately 50 unknown, acquisition items for each participant. However, when all of these task items had been mastered, then the experimenter administered another pretest in the same category or a different category, depending on the participant, to determine additional acquisition items.

Praise-comparison evaluation. The purpose of the praise-comparison evaluation was to compare the effects of descriptive and general praise for mastering letters, phonemes, and sight-words by preschool-age children. In all phases of the praise-comparison evaluation, three unknown task items were assigned to each condition. To reduce the likelihood of having different categories of task items across various conditions (e.g., having all letters in one condition and all phonemes in another condition), the experimenter always began a phase using task items from a single category across all conditions. In addition, across conditions within a particular phase, task items were equated for the number of syllables in the phonemes or sight words in an attempt to control for the level of difficulty. Task items that looked similar (e.g., lowercase letters b and p) or sounded similar (e.g., started with the same first letter, ended with the same last letter, or both such as "pit" and "pet") were not assigned to the same condition within a particular phase. As task items were mastered in a particular condition

(i.e., after the participant got it correct all 3 times across two consecutive sessions), new unknown task items were introduced in the next session in that condition, such that across conditions, there were always three unknown (or acquisition) task items. Furthermore, mastered task items were replaced by unknown task items from the same category of task items when possible (e.g., unknown phonemes replaced mastered phonemes, and unknown uppercase letters replaced mastered uppercase letters). However, once a participant mastered all stimuli from a particular category, then the experimenter would pull task items from the next category. For example, if all uppercase letters were mastered by a participant, the experimenter then selected unknown lowercase letters to be included as acquisition stimuli. Similarly, once a participant mastered all lowercase letters, the experimenter would select unknown phonemes as acquisition stimuli.

Prior to the study, the lead experimenter generated nine different descriptive-praise statements, general-praise statements, and neutral statements, which were delivered to all participants in relevant conditions of the study (as mentioned, see Table 1 for complete list of statements used in the study). Across all sessions, each of the nine statements assigned to the different conditions was delivered a maximum of one time. For example, the same nine descriptive-praise statements were delivered in every descriptive-praise session, and each of the statements was delivered a maximum of one time during that session, meaning that the same statement was never delivered more than once in a single session. Throughout all phases of the study, the same experimenter conducted all sessions with a particular participant to control for experimenter effects across conditions.

Experimental design. A combined multielement and reversal design was used to demonstrate experimental control. A multielement design was used to compare the effects of different conditions (three or four, depending on the participant) within phases. The order of conditions in a particular phase was determined quasi-randomly. That is, the experimenter determined the first condition to conduct, then once that condition was conducted, the experimenter selected the next condition to be conducted out of the remaining conditions, and so on until all conditions had been conducted in a session block. This process was conducted throughout each phase. Furthermore, we used a reversal design to replicate our effects of the influence of various variables.

General procedure. In our initial evaluation with most participants (i.e., Emma, Blake, Maddy, Xander, Frank, and Jesse), we included three phases in an attempt to compare the effects of descriptive-versus-general praise. The phases included baseline, exposure, and exposure plus praise. Within each of these phases, three different conditions were conducted that were associated with descriptive praise, general praise, and our control condition (neutral statements). In baseline phases, three different conditions (with three different task items assigned to each condition) were conducted to determine whether mastery of task items would occur in the absence of exposure or programmed consequences. In exposure phases, three different conditions were conducted to determine whether mastery of task items would occur when the participant was only provided brief exposure to the correct response in the presence of the flashcard. In the exposure plus praise phases, three different conditions were conducted to compare the effects of descriptive and general praise. That is, each condition was assigned to one of three conditions (descriptive praise, general praise, or neutral statements). The

neutral-statements condition was included as a control condition in an attempt to control for the delivery of vocal-verbal attention across conditions. Across all phases, when participants displayed low or no acquisition, the same flashcards were used in the next phase. For example, if the participant displayed low or no acquisition in the exposure phase, the same flashcards were used in the exposure plus praise phase. However, if the participant displayed steady mastery in the exposure phase, then new flashcards that were unknown to the participant, as determined by the pretest, were used when the next phase was implemented.

Participants who mastered no or few task items in the exposure plus praise phase were exposed to an additional condition that included the delivery of preferred edibles (exposure plus praise plus edibles) in and attempt to determine whether we could get better mastery with a preferred edible as a consequence for correct responding. This allowed us to answer the question as to whether mastery was low due to the difficulty of the task or whether it was because the consequences were not potent reinforcers. Preferred edibles were determined by conducting a 5-item paired stimulus preference assessment (PSPA; Fisher et al., 1992). Prior to this assessment, the experimenter provided pre-session access to each of the edible items by presenting each item to the participant, and allowing the participant to consume it. On each trial of the assessment, the experimenter placed two edibles equidistant and in front of the participant and said to the participant, "Pick your favorite." Contingent upon selection, the experimenter immediately removed the edible item not selected by the participant and provided the participant with a brief consumption period of the selected edible item. If a participant did not select either edible item within 5 s, data collectors denoted "no selection" on the

data sheet, and the experimenter moved on to the next trial. This process was repeated until each edible item had been presented with every other edible item once for a total of 10 trials. The top two edible items selected by the participant were used in the exposure plus praise plus edible phases of the study. Specifically, before the beginning of each session block that included edibles, the experimenter asked the participant to choose which one of these top two edibles they wanted to be used in that session block.

For some participants (Ali and Mario), we used a different experimental arrangement to compare the effects of descriptive and general praise. Because under our original arrangement we observed similar levels of task mastery under the neutral-statements condition as our praise conditions for several participants, we thought it might be more efficient to rapidly alternate the two praise conditions, the neutral statements condition, and the exposure condition (as an additional control condition) within each phase. Thus, for these participants, phases included baseline in which four different baseline conditions were conducted, praise, in which the two different praise conditions, the neutral-statements condition, and the exposure condition were conducted, and praise plus edible, in which the same conditions conducted in the praise phase were conducted but with the addition of edibles in each condition.

During all sessions, the experimenter sat across the table from the participant and presented nine trials in which the three different task items for that session were presented on flashcards. The three task items were presented three times each in a quasi-random order (i.e., all three task items were presented once before repeating presentations); however, the same task item was not presented on consecutive trials. Each condition was associated with various discriminative stimuli in an attempt to

enhance discrimination across conditions within and across phases. That is, different conditions were associated with different colored table cloths on the session table and different colored flashcard backgrounds. Prior to each session, the experimenter ensured the participant's ready behavior, pointed to the table cloth, and asked the participant, "What condition is this?" The participant said or was prompted to say the color of the condition (e.g., "The white condition.") in response. On each trial, the experimenter held up one of the three flashcards assigned to the condition being conducted and asked the participant, "What is this?" The trial lasted 5 s or until the participant provided a response, whichever came first; however, depending on the condition being conducted, different antecedent and consequence procedures were implemented. Across all sessions, the therapist maintained a pleasant facial expression and interacted in a warm and friendly manner with the participant. Furthermore, all vocal consequences were delivered with a similar, enthusiastic voice tone.

Baseline. During all baseline sessions, the flashcard backgrounds were white, and there was a white table cloth on the table. If the participant responded correctly or incorrectly (i.e., incorrectly labeled the task item or said, "I don't know"), the experimenter did not provide any consequences and immediately presented the next flashcard. If the participant did not respond, the experimenter continued to present the flashcard (i.e., held the flashcard in front of the participant) for the remainder of 5 s before presenting the next flashcard.

Exposure. Exposure sessions were similar to baseline, except that prior to the beginning of the session, the experimenter presented each of the flashcards to the participant while telling them what was on the flashcard and prompting them to repeat it.

For example, for the flashcard depicting the word *cat*, the experimenter held up the flashcard with the word *cat* and said, "This is *cat*. Say *cat*."

General praise. General-praise sessions were similar to exposure sessions, except for the flashcard backgrounds and table cloths were blue, and the experimenter delivered one of nine possible general-praise statements for correct responding. After the delivery of a general praise statement or an incorrect response, the experimenter presented the next flashcard.

Descriptive praise. Descriptive-praise sessions were similar to exposure sessions, except for the flashcard backgrounds and table cloths were red, and the experimenter delivered one of nine possible descriptive-praise statements for correct responding. After the delivery of a descriptive-praise statement or an incorrect response, the experimenter presented the next flashcard.

Neutral statements. Neutral-statements sessions were similar to exposure sessions, except for the flashcard backgrounds and table cloths were green, and the experimenter delivered one of nine possible neutral statements for correct responding. After the delivery of a neutral statement or an incorrect response, the experimenter presented the next flashcard.

Edible. During some sessions, edibles were added to the contingencies in place for the particular session. During these sessions, the experimenter delivered a small piece of a preferred edible for correct responding.

Preference evaluation. The purpose of the preference evaluation was to (a) determine whether praise was preferred over the contingencies in other conditions and, if so, (b) the type of praise that was most preferred. A concurrent-chains arrangement was

used to determine each participant's preferred condition. Prior to the beginning of the initial link, the experimenter presented the participant with stacks of flashcards and stimuli associated with all conditions and provided pre-session exposure to all conditions. That is, the participant experienced the contingencies associated with correct responding in all conditions (i.e., descriptive praise, general praise, neutral statements, and exposure alone) before he or she was prompted to choose the condition to be conducted. During the initial link, the participant was asked to choose the condition that he or she wanted to be conducted. When the participant made a selection, the experimenter immediately set up the selected condition, and the conditions not chosen by the participant were removed. During the terminal link, the experimenter conducted the condition that was chosen by the participant. All sessions associated with the different conditions were conducted as described above. The dependent variable was the number of times each condition was chosen by the participant in the initial link.

Data were collected on the condition chosen by the participant (e.g., the participant touching one set of stimuli when instructed by the experimenter to, "Pick one"). Data collectors scored which set of flashcards (each associated with a different type of condition) was chosen by the participant prior to the beginning of that session. An exact agreement method was used to determine IOA for the choice of conditions during the preference-evaluation phase. An agreement was defined as both observers scoring the same condition chosen by the participant. That is, an agreement was scored if both observers agreed on which condition was chosen, and a disagreement was scored if the two observers disagreed. Thus, IOA for participant selection of the condition for a particular session was wither 100% (the two observers agreed) or 0% (the two observers

disagreed). IOA was calculated for 33% of Emma's preference-evaluation sessions, 67% of Blake's preference-evaluation sessions, 56% of Maddy's preference-evaluation sessions, 38% of Xander's preference-evaluation sessions, 20% of Frank's preference-evaluation sessions, 80% for Jesse's preference-evaluation sessions, and 42% of Mario's preference-evaluation sessions. Mean IOA for all participants' preference-evaluation sessions was 100%.

Some of our participants reported during the preference-evaluation phase that they chose a specific condition because it was associated with their favorite color. If the participant continued to choose a condition that was associated with the color they reported to be their favorite, the experimenter conducted a color PSPA (Heal, Hanley, & Layer, 2009). Color-PSPA sessions were conducted similar to the edible item PSPA. All color PSPAs included nine colors: the four colors included in the study (i.e., white, red, blue, and green) as well as yellow, purple, black, orange, and brown. All colors were presented to the participant in form of construction paper cut in a rectangular shape (76.2 mm by 127.0 mm).

Results

Each figure contains two graphs for each participant regarding their acquisition of task items. The top graph depicts the cumulative number of mastered task items using our mastery criteria of two consecutive sessions in which the participant got 100% correct on that task item (i.e., got the task item correct all 3 times it was presented within a session across two consecutive sessions). The bottom graph depicts the number of task items correct in each session (the task item was graphed as correct if the participant correctly read the flashcard all 3 times it was presented in each session). The latter

analysis allowed us to determine how much correct responding was occurring within and across phases even if the participant was not mastering items according to our mastery criteria.

Figure 1 depicts data for Emma, the only participant for whom praise was most effective for acquisition of task items. As depicted in the top panel of Figure 1, Emma did not master any task items in any of the conditions across baseline phases. In the initial exposure plus praise phase, Emma mastered task items in both the descriptive-praise and general-praise conditions as well as the neutral (control) condition; however, mastery stopped occurring sooner in the neutral (control) condition as compared to the other conditions. These results were replicated in a subsequent phase, which showed even more robust results. That is, Emma's cumulative number of mastered task items was much higher in the descriptive- and general-praise conditions as compared to the neutral (control) condition. These data suggest that exposure plus praise statements are effective for acquisition but the type of praise was not an influential variable. In the first exposure phase, Emma mastered very few task items across conditions, and these results were replicated in a subsequent phase. These data suggest that exposure alone was not sufficient for the mastery of task items. Thus, the effective variable was the delivery of praise (general or descriptive). As depicted in the bottom panel, when we analyzed the number of correct task items in each session, we found similar results in both exposure plus praise phases. That is, Emma engaged in most correct responding in general- and descriptive-praise conditions as compared to the neutral (control) condition. Interestingly, however, even though Emma mastered very few task items across both exposure phases (as shown in the top panel of Figure 1), data in the bottom panel of

Figure 1 suggest that she was engaging in slightly more correct responding in the second exposure phase than the first exposure phase. Regardless, more correct responding in the last exposure phase did not result in continued mastery per our two-session mastery criteria. Overall, Emma's data in Figure 1 show that praise, regardless of type, was effective for mastery of task items. Emma's preference data suggest that she preferred general praise to descriptive praise, neutral statements, and exposure. That is, she chose general praise on 4 out of 6 trials of the evaluation.

Figure 2 depicts data for Blake, the only participant for whom exposure was sufficient for the mastery of task items. Blake mastered very few task items across all sessions in all baseline phases. In the initial exposure phase, Blake mastered task items similarly across all conditions. These results were replicated in all subsequent exposure phases. In the initial exposure plus praise phase, Blake mastered task items similarly across the descriptive-praise and general-praise conditions as well as the neutral (control) condition. These results were replicated in subsequent exposure plus praise phases. Thus, these data suggest that praise was not necessary for Blake's acquisition of task items, and that the exposure to the correct answer provided by the experimenter prior to the beginning of session was sufficient for Blake's acquisition of task items. In our analysis of the number of task items correct (bottom panel), we found similar results. That is, there was similar acquisition across exposure phases and exposure plus praise phases. Blake's preference data suggest that he preferred neutral statements to descriptive praise, general praise, and exposure. That is, he chose neutral statements on 6 out of 6 trials of the evaluation.

Figures 3 - 6 depict data for Maddy, Xander, Frank, and Ali, four of our participants who did not consistently master task items with the two-session mastery criteria when exposure and praise were provided for correct responding. That is, exposure alone nor praise was not sufficient for these participants' mastery of task items, and supplementary reinforcement (i.e., edibles) was used for acquisition. Figure 3 depicts data for Maddy. As depicted in the top panel of Figure 3, Maddy did not master task items in the baseline phase or exposure phases. In the initial exposure plus praise phase, Maddy mastered very few task items across conditions, and over time mastery stopped all together. Similarly, in the subsequent exposure plus praise phase, in which Maddy did not master any task items. In the next phase, when edibles were added to all conditions, Maddy began mastering items. In the initial exposure plus praise plus edible phase, Maddy mastered task items across all conditions, with the highest number of task items mastered in the neutral (control) condition, followed by the descriptive-praise condition. In a subsequent exposure plus praise plus edible phase, Maddy again mastered task items across all conditions; however, she mastered the highest number of task items in the general-praise condition as compared to the descriptive-praise condition and neutral (control) condition. Given the inconsistencies in mastery across these two phases, these data suggest that edibles, and not praise, were most likely the variable influencing mastery. Furthermore, the variability in mastery across conditions in these phases may have been due to differences in the task items rather than the different conditions. When we analyzed the data based on the number of correct task items in each session (bottom panel), however, we found similar patterns except for in the first exposure plus praise phase. That is, at least initially in this phase, Maddy was getting task items correct across

all conditions. Additionally, even though Maddy mastered more task items in some conditions than others (as depicted by the top panel of Figure 3) across exposure plus praise plus edible phases, data in the bottom panel show that she engaged in similar levels of correct responding across all conditions. Overall, Maddy's data in Figure 3 show that praise was not effective for acquisition, and that acquisition was likely influenced by delivery of edibles. Preference data for Maddy suggest that she preferred descriptive praise to general praise, neutral statements, and exposure, albeit with edibles were also provided for correct responding. That is, she selected descriptive praise on 8 out of 18 trials, and on 4 of the last 7 trials of the evaluation.

Figure 4 depicts data for Xander. As depicted in the top panel of Figure 4, Xander mastered very few task items in baseline and exposure phases. In addition, during both exposure plus praise phases, Xander mastered very few items across all condition suggesting that praise was not effective for Xander's mastery of task items. In the first exposure plus praise plus edible phase, Xander mastered more task items in the descriptive-praise condition than in the general-praise and neutral (control) conditions, whereas in the second exposure plus praise plus edible phase, Xander mastered similar and slightly more task items in both the descriptive- and general-praise conditions than in the neutral (control) condition. However, mastery across all conditions was generally very low. These data suggest that the addition of edibles were most likely the variable influencing acquisition (similar to Maddy's results); however, even with edibles, Xander continued to master very few skills with the two-session mastery criteria. When we analyzed the number of correct task items in each session (bottom panel), results showed that Xander was engaging in comparable levels of correct responding across all phases

(except baseline) and conditions of the study. That is, even though Xander mastered slightly more task items when edibles were provided than when praise or exposure were provided, he was still engaging in correct responding similarly across exposure, exposure plus praise, and exposure plus praise plus edible phases. Overall, Xander's data in Figure 4 show that praise was not effective for mastery of task items, and that edibles slightly increased mastery of task items, even though their effects were not robust. Preference data for Xander suggest that he preferred exposure to exposure plus descriptive praise, general praise, and neutral statements, albeit when edibles were also provided for correct responding. That is, Xander chose exposure alone on 7 out of 13 trials, and on 4 of the last 7 trials of the evaluation. The results may suggest that praise was aversive, or at the very least non-preferred. Furthermore, these data may suggest that the delivery of the edible only (given that the exposure condition in the preference evaluation was the only condition in which only edibles were delivered) was most preferred.

Figure 5 depicts data for Frank. As depicted in the top panel, Frank did not master any task items in baseline-or-exposure conditions. In the initial exposure plus praise phase, Frank mastered task items in all conditions; however, acquisition stopped in the general praise and neutral (control) conditions more quickly than they did in the descriptive-praise condition. Thus, in this phase, Frank mastered slightly more task items in the descriptive-praise condition than in the general praise and neutral (control) conditions. However, in the second exposure plus praise phase, Frank mastered very few task items across conditions. Similar effects were found in the third exposure plus praise phase. These data suggest that over time, praise was ineffective for mastery of task items. In the initial exposure plus praise plus edible phase, Frank mastered task items

similarly across all conditions, with slightly more mastery in the general-praise condition than in descriptive-praise and neutral (control) conditions. These effects were replicated in the subsequent exposure plus praise plus edible phase, except that the descriptive-praise condition and the neutral (control) condition resulted in slightly more mastery than the general-praise condition. These data suggest that praise was not effective for mastery of task items and that edibles were necessary for consistent and continued mastery of task items. When we analyzed the number of correct task items in each session (bottom panel), we found similar results. That is, Frank consistently got more items correct in conditions with edibles, suggesting that edibles were more effective reinforcers for correct responding. Overall, Franks data suggest that praise was not sufficient for the mastery of task items, and that edibles were necessary for acquisition. Frank's preference data suggest that he preferred exposure to exposure plus descriptive praise, general praise, or neutral statements. Thus, similar to Xander, praise (or vocal-verbal attention in general) may have been aversive or he may have been choosing exposure because he preferred only receiving edibles for correct responding. In fact, Frank chose exposure (with edibles) on 6 out of 6 trials of the evaluation.

Figure 6 depicts data for Ali. As depicted in the top panel, Ali did not master any task items in any of the conditions in the baseline phase. In the initial praise phase, Ali mastered only one task item in all conditions (i.e., exposure alone, descriptive praise, general praise, and neutral statements), and mastery quickly stopped in the phase. In the initial praise plus edible phase, Ali mastered a similar and higher number of task items in the general-praise, neutral (control), and exposure conditions as compared to the descriptive-praise condition. In the subsequent praise phase (after a history with edibles),

Ali mastered very few task items in the descriptive- and general-praise conditions, and slightly more task items in exposure –and-neutral (control) statements conditions; however, acquisition stopped over time (similar to first praise phase). In the next praise plus edible phase, Ali mastered more task items in the descriptive-praise condition than in the general, neutral (control), and exposure conditions. Given the differences in mastery across the praise plus edible phases, these data suggest that mastery was likely influenced by the delivery of edibles for correct responding. When we analyzed the number of correct task items in each session (bottom panel), we found that (a) Ali engaged in more correct responding across sessions when edibles were delivered and (b) regardless of the type of condition in the edibles phases, similar levels of correct responding occurred across conditions. Overall, Ali's data in Figure 6 suggest that praise was not effective for the mastery of task items. However, immediately following a history with edibles, more mastery of task items occurred in various conditions in the second praise phase as compared to the first praise phase. However, after the first several sessions, correct responding and mastery decreased in this phase. Due to family relocation, we were not able to conduct the preference-evaluation phase with Ali.

Figures 7-10 depict data for Jesse and Mario, two of our participants who both initially required edibles for continued mastery, but in subsequent phases (after a history with edibles), required only exposure (Jesse) or praise (Mario) for task mastery. Additionally, these were the only participants with whom additional analyses were conducted based on their reports about choosing various conditions in the preference-evaluation phase based on color preferences.

Figures 7 and 8 depict the data for Jesse, the only participant for whom only exposure was necessary for acquisition after a history with edibles. Figure 7 depicts data from the initial praise evaluation and preference evaluation. As depicted in the top panel of Figure 7, Jesse mastered only one task item in the four baseline phases that we conducted. In the initial exposure phase, Jesse mastered task items similarly across all conditions; however, mastery stopped over time. These data suggest the exposure what initially effective for mastery but did not maintain consistent mastery over time. In the first exposure plus praise phase, Jesse did not master any task items. However, in the exposure plus praise plus edibles phase, Jesse showed consistent mastery over time across all conditions, with slightly quicker mastery in the descriptive-praise condition as compared to the general-praise and neutral conditions. In the second and third exposure plus praise phases (after a history with edibles for correct responding and associated with the different conditions), unlike the initial exposure plus praise phase, Jesse also mastered task items similarly across conditions with somewhat more mastery in descriptive-praise conditions as compared to the other two conditions. However, similar acquisition was found in exposure only phases after a history with edibles. Thus, these data suggest that mastery occurred with exposure only after a history with edibles; however, the addition of descriptive praise (after a history with edibles) may have resulted in more or quicker mastery. When we analyzed the number of correct task items in each session, we found similar results. That is, following a history of edibles, Jesse had an increased number of task items correct in conditions in which exposure was used (with or without praise); however, when praise was delivered, somewhat more correct responding occurred in descriptive praise conditions as compared to the other conditions that involved the

delivery of vocal-verbal attention (general praise or neutral statements). Preference data for Jesse suggest that he preferred descriptive praise to general praise, neutral statements, and exposure. That is, he chose descriptive praise on 6 out of 9 trials, and 5 out of the last 7 trials of the evaluation.

As mentioned, Jesse reported during the preference assessment phase that his favorite color was red, which was the color of stimuli associated with his most preferred condition (descriptive praise). Therefore, in an attempt to see if he might be picking descriptive praise because of a color preference, we conducted additional analyses. First, we conducted a color preference assessment to determine a preference hierarchy of the colors associated with each of the conditions (red, white, and blue) as well as other colors (yellow, black, brown, pink, orange, and purple). Results of this assessment are in Figure 8 (top panel). Jesse's highest preferred colors were red (associated with the descriptive-praise condition) and white (associated with the baseline and exposure only conditions) and his third favorite color was blue (associated with the general praise condition). Thus, Jesse's three most preferred colors in this assessment were those associated with the different conditions of the study. In an attempt to further answer our question as to whether Jesse was choosing descriptive praise because of the color of the stimuli associated with that condition, we again conducted an exposure plus praise plus edible phase in which we rapidly alternated descriptive-praise, general-praise, and neutral conditions; however, these conditions were now associated with less preferred colors (as determined from the color preference assessment). That is, the different conditions (descriptive praise, general praise, and neutral) were associated with orange, pink, and purple stimuli, respectively. Then, after conducting this phase again with these new

stimuli, we conducted another preference evaluation. Results of this evaluation are in the middle panel of Figure 8. Results showed mastery across all conditions with somewhat higher mastery in descriptive-praise as compared to the other two conditions, which replicated results from the previous praise evaluation. Furthermore, in the preference evaluation phase, Jesse again selected descriptive praise more than the other conditions; however, on a similar number of trials as neutral and exposure conditions. That is, out of 14 trials, he selected descriptive praise 5 times, neutral statements 4 times, exposure alone 4 times, and general praise 1 time. Overall, these results suggest that he may have chosen descriptive-praise because he preferred red; however, he may also have been choosing red (and preferred red) because of its association with the descriptive praise condition. Therefore, in an attempt to answer this question, we conducted another color PSPA. Results (bottom panel of Figure 8) show that although blue continued to his most preferred color, other colors that were associated with the new praise evaluation phase moved up in preference (purple and orange) and colors associated with the previous preference evaluation moved down in preference (red).

Figures 9 and 10 depict data for Mario, the only participant for whom praise was necessary for acquisition, but only after a history with edibles. Figure 9 depicts data for the praise evaluation and preference evaluation, and Figure 10 depicts additional analyses that were conducted with Mario based on his preference evaluation results. As depicted in the top panel of Figure 9, Mario did not master any task items in any of the conditions across baseline phases. In the initial praise phase, Mario did not master any task items (except for one in exposure). In the praise plus edibles phase, Mario mastered task items across conditions, with more steady and robust mastery in the descriptive-praise

condition and neutral (control) condition. Thus, initial acquisition was due to the addition of edibles; however, over time, acquisition continued to occur only in the descriptive and neutral conditions. Furthermore, after a history of edibles for correct responding, in the second praise, phase, mastery occurred similarly across all conditions; however, in the third praise phase, mastery was more consistent once again under descriptive and neutral conditions. These data suggest that following a history with a phase in which edibles were provided for correct responding, attention was effective for Mario's mastery of task items. When we analyzed the number of correct task items in each session (bottom panel), we saw similar results. That is, with the addition of edibles and following a history with edibles delivered for correct responding, more correct responding occurred in conditions with descriptive praise and neutral statements. Interesting, however, Mario preferred general praise over the other conditions. That is, Mario chose general praise on 7 out of 12 trials and on the last 5 trials.

Given that Mario preferred a condition that seemed to be ineffective for mastery, we also decided to conduct a color preference assessment to determine whether he was choosing general praise because it was associated with the color. Figure 10 depicts the results of the color preference assessment. Results suggested that his top three favorite colors (ranked at or higher than 80%) were red, orange, and blue. Given that red and blue were two of his three favorite colors and the colors associated with the condition that he chose more often in the preference evaluation, it is possible that he was choosing these conditions based on a color preference rather than the contingencies associated with them.

Discussion

The purpose of the current study was to compare the effects of descriptive praise and general praise for acquisition in young children. Additionally, we sought to evaluate individual child preference for these two types of praise. Of eight participants, only two participants mastered items without the addition of edibles (Emma and Blake). Of these two participants, one participant (Emma) mastered task items more consistently and had a higher number of correct responses in general praise and descriptive praise sessions as compared to control conditions. For the other participant (Blake), results showed that only exposure was necessary for mastery and correct responding. That is, Blake mastered task items similarly across exposure and exposure plus praise phases. For the remaining six participants, edibles were necessary for initial mastery of task items and higher and sustained levels of correct responding. Of these six participants, four participants (Maddy, Xander, Frank, and Ali) mastered task items only when edibles were delivered for correct responding, and two participants (Jesse and Mario) mastered task items under exposure (and possibly slightly better mastery under descriptive praise; Jesse) and attention conditions (descriptive praise and neutral statements; Mario), but only following a history with edibles. Overall, these results showed that praise was not a robust procedure for teaching new skills to the majority of our participants without the use of supplementary reinforcement. Furthermore, our study replicated previous research by showing that descriptive praise and general praise had negligible differences, similar to the findings of Polick et al. (2012) and Stevens et al. (2011).

Our study yielded several additional interesting findings. One finding is that the use of praise or supplementary reinforcement was unnecessary for mastery of task items for one of our participants (Blake). That is, providing the correct answer in the presence

of the flashcard prior to the beginning of each session (exposure) was sufficient for correct responding and mastery of task items for Blake. Thus, it may be that imitating the experimenter in the presence of the target item resulted in the task item becoming discriminative for correct responding. Furthermore, "getting it correct" may have become reinforcing. Interestingly, Blake preferred neutral statements to descriptive praise, general praise, and exposure during the preference-evaluation phase. This could be because neutral statements signaled the progression of the sessions (e.g., "Time to move on", "Let's keep moving along"), or because neutral statements were novel, making them more preferred than the other types of attention evaluated in our study.

Another interesting finding was that 6 of 8 participants began mastering items or more consistently mastering items after edibles were added. Of these participants, four (Maddy, Xander, Frank, and Ali) required edibles for mastery regardless of the other variables. That is, they did not master task items with exposure or praise. These data suggest that edibles are more potent reinforcers than praise (at least the forms of praise we manipulated in the current study). There are several reasons why edibles were more effective for these individuals. First, previous researchers have shown that edibles are powerful primary reinforcers that have been shown to influence behavior regardless of motivating operations (e.g., deprivation and satiation conditions; e.g., Dozier, Iwata, Thomason-Sassi, Worsdell, & Wilson, 2012; Fahmie, Iwata, & Jann, 2015; Hopkins, 1968; North & Iwata, 2005). Second, previous research has suggested that motivating operations such as deprivation from stimuli such as food or preferred edibles may influence the efficacy of stimuli as reinforcers and increase behaviors that result in access to those reinforcers (e.g., Michael, 1982 & Michael, 1993). It is possible that deprivation

from edibles (at least the edibles we used such as chocolates, chips, and gummies) in the preschool classroom increased the reinforcing efficacy of edibles for our participants. That is, because small pieces of high-preferred snacks are not typically available in the preschool program in which the participants were enrolled, it is possible that this enhanced the reinforcing efficacy of these stimuli, particularly as compared to praise and other forms of attention that were available at a high level in the preschool program.

Another interesting finding in the study was that it was possible to establish the efficacy of non-edible conditions (e.g., exposure, exposure plus praise) as effective for mastery after a history with edibles for two participants (Jesse and Mario). For these participants, edibles were only necessary for initial or better acquisition, but were not necessary in subsequent phases, given that after a history with edibles, both participants continued to master task items in subsequent phases without the need for edibles. Following a history with edibles, Jesse (Figure 7) acquired task items across all attention conditions and exposure alone phases, suggesting that only exposure was necessary for mastery. However, it is important to note that descriptive praise may have been somewhat more effective for mastery after it was associated with a history with edibles. Similarly, after a history with edibles, Mario (Figure 9) acquired task items across all attention and exposure conditions, suggesting that only exposure was necessary for the acquisition of task items. After a longer history with the use of edibles, however, Mario only continued to acquire task items across conditions in which attention (i.e., descriptive praise, general praise, or neutral statements) were delivered for correct responding, suggesting that overtime, the delivery of attention was necessary for the acquisition of task items. For both Jesse and Mario, it could be that they acquired task items in

subsequent phases without edibles for several reasons. First, it could be that edibles enhanced the participants' attending to the session stimuli. That is, before edibles were introduced, participants may not have been attending to the stimuli presented by the experimenter. However, once the experimenter began providing edibles for correct responding, it is possible that the presence of the edibles increased attending behavior and other behaviors that were necessary for correct responding. Second, due to the pairing of edibles with the task stimuli (flashcards, experimenter), the stimuli may have become discriminative stimuli (SDs) for correct responding. Thus, even when the edibles were no longer provided in subsequent phases, the stimuli continued to control correct responding. Third, it is possible that responding correctly became a reinforcer because it was paired with the delivery of edibles. Fourth, it is possible that edibles paired with certain vocal-verbal responses from the experimenter, resulted in those experimenter responses becoming reinforcers.

For each participant, we analyzed the data not only based on mastery but also based on the number of correct task items in each session. As mentioned previously, we conducted this analysis because we observed that some participants were not meeting our mastery criteria, despite responding correctly within sessions (e.g., Xander). These data contributed some interesting findings for some of our participants who were shown to be engaging in correct responding but were still not meeting the mastery criteria in that they showed that some consequences may be effective for correct responding, but not necessarily effective for meeting the mastery criteria. Thus, future studies may want to investigate the effects of praise on other behaviors while looking at the immediate effects that praise may have on behavior (e.g., number of instructions followed, amount of steps

completed correctly, etc.). Overall, however, our analysis of the number of correct items in each session did not yield findings that would have shifted the outcomes of the overall conclusions of our study.

Preference evaluation data showed that the majority of our participants (5 of 7) preferred attention conditions (i.e., descriptive praise, general praise, and neutral [control] conditions) to the non-attention condition (i.e., exposure). Furthermore, of the 5 participants that preferred attention over no attention, 4 preferred praise over neutral conditions. That is, two participants preferred descriptive praise (Maddy and Jesse) and two participants preferred general praise (Emma and Mario). The preference-evaluation phase was conducted with five (Maddy, Xander, Frank, Jesse and Mario) of our six participants who required edibles for initial or better mastery. For participants who required edibles for mastery (i.e., Maddy, Xander, and Frank), the experimenter delivered preferred edibles in all of the selected conditions in addition to the other variables associated with those conditions. Thus, edibles were also included in the exposure alone phase if the participant selected it to be conducted. Preference data for Xander and Frank were interesting because they showed that they both preferred exposure to descriptive praise, general praise, and neutral statements. Thus, they were choosing the condition in which only edibles were delivered for correct responding, which was consistent with their praise evaluation results---edibles were most effective for correct responding. It is also possible that they preferred exposure because attention from the experimenter was aversive or because only contingent access to edibles alone was preferred.

As mentioned above, our study showed that praise, regardless of the type, was not an effective reinforcer for acquisition in young children. Given these outcomes, it is

important to note several limitations of our study that may have influenced our results. First, the rapid alternation of several conditions that included multiple tasks may have decreased the likelihood of observing quick mastery of tasks and potential differences across conditions. Second, the praise and attention statements that were used in the study may have influenced responding. For example, the statements were all equated at four-words each, which may have affected their reinforcing efficacy, possibly because they were not as naturalistic as they would be if they were delivered in the natural environment. In addition, the praise and attention statements that were used in the study were the same nine statements within each condition that were used throughout the whole study. This may have been a limitation because the participants may have habituated to the statements, such that they lost their reinforcing efficacy. In fact, some of the initial praise conditions for some of our participants showed a decrease in mastery over time. Future research may include investigating the effects of descriptive praise and general praise using a larger bank of descriptive and general praise statements to increase the variability of praise statements.

Another limitation of our study was that our mastery criteria may have been too stringent to show subtle effects of the influence of praise on the acquisition of skills. When we suspected that our mastery criteria may be masking some of the subtle effects of praise, we conducted two retrospective analyses of participant data that are not included in the current study. All retrospective analyses were conducted using the raw data for each participant. The purpose of the first analysis was to analyze participant data across conditions and phases using the same number of sessions (i.e., the first X number of sessions) in an attempt to control for the number of sessions conducted across the

different conditions and phases, given that one of the limitations of our study was that we compared the effects of praise across phases that were not equated for number of sessions. That is, some phases were longer than others, suggesting that we could observe different effects if we equated the number of sessions for each condition across all phases. To determine the number of sessions to use for this analysis for a particular participant, we determined the highest number of sessions conducted in *all* conditions and phases (excluding the baseline and preference phases) and used that number. For example, if the highest number of sessions conducted in all conditions and phases was five, then we only used the data for the first 5 sessions in all of the conditions and phases for this analysis. Furthermore, we analyzed the data from these sessions by calculating the mean number of mastered words in that condition or phase (within that maximum number of sessions) and depicted those means across conditions and phases in a bar graph.

The purpose of the second analysis was to analyze the data with respect to single-session outcomes (because we observed that some participants were responding correctly within session but were not necessarily meeting the two-session mastery criteria). Therefore, we analyzed and re-graphed the data using a less stringent, one-session mastery criterion in which the participant had to get the flashcard correct all three times in only one session for that task item to be considered a mastered item for a particular session. The limitation of this procedure was that a task item could be considered a mastered item in multiple sessions if the participant got it correct in all three presentations within a session across multiple sessions but not in two consecutive sessions. Conversely, if the participant got it correct all three presentations across two

consecutive sessions, then it met our standard two-session mastery criteria and was removed from the pool of task items and replaced with a new acquisition task item. Overall outcomes of these additional analyses yielded similar results as those yielded by data depicted in our two-session mastery criteria and number of items correct analyses depicted in our figures.

Finally, another limitation of our study is that it could be that praise from the experimenter is qualitatively less valuable than praise that is delivered by a parent or guardian. Therefore, future research should include evaluations of whether praise from other individuals in children's lives (e.g., parents, guardians, peers) would have different effects on children's acquisition and responding.

In summary, results of our study suggest that descriptive praise may not be as robust of a teaching procedure as it is often reported to be (e.g., Brophy, 1981), at least under the conditions in which we evaluated the effects. However, some of our participants' results suggested that potent reinforcers such as edibles can be used to increase acquisition under conditions that initially made acquisition unlikely. Therefore, when teachers and practitioners use praise as a reinforcer for acquisition, they must take into consideration that studies looking at the effects of praise on acquisition have only been able to establish acquisition when supplementary reinforcement (e.g., tokens and edibles) and additional teaching procedures (e.g., corrections and prompts) were used with praise for teaching young children. Although some researchers report that general praise is inappropriate and even ineffective for teaching young children (Burnett, 2010; Hawkins & Heflin, 2011), results of our study suggest that praise alone, regardless of the type, may be ineffective for teaching new skills to young children.

References

Allday, R.A., Hinkson-Lee, K., Hudson, T., Neilsen-Gatti, S., Kleinke, A., & Russel, C.S. (2012). Training general educators to increase behavior-specific praise: Effects on students with EBD. *Behavioral Disorders, 37*(2), 87-98.

Brophy, J. (1981). Teacher praise: a functional analysis. *American Educational Research Association*, *51*(1), 5-32. doi: 10.3102/00346543051001005

Burnett, P. C. (2010, July). Teacher praise and feedback on students' perception of the classroom environment [Electronic version]. *Educational Psychology*, *22*(1), 5-16. doi:10.1080/0144341012010121

Burnett, P. C., & Mandel, V. (2010). Praise and feedback in the primary classroom: Teachers' and students' perspectives. *Australian Journal of Education and Developmental Psychology*, *10*, 145-154. doi: 10.1080/01443410120101215

Casey, L.B. & Carter, S.L. (2016). Applied behavior analysis in early childhood education: An introduction to evidence-based interventions and teaching strategies (p. 35). New York, NY: Routledge.

Chalk, K., & Bizo, L. (2004). Specific Praise improves on-task behaviour and numeracy enjoyment: A study of year four pupils engaged in the numeracy hour. *Educational Psychology in Practice, 20*(4), 335-351. doi: 10.1080/0266736042000314277

DiCarlo C. F, Reid D. H. Increasing pretend toy play of toddlers with disabilities in an inclusive setting. *Journal of Applied Behavior Analysis*. (2004);37:197–207. doi: 10.1901/jaba.2004.37-197

Dozier, C. L., Iwata, B. A., Thomason-Sassi, J., Worsdell, A. S., & Wilson, D. M. (2012, December). A comparison of two pairing procedures to establish praise as a reinforcer. *Journal of Applied Behavior Analysis*, *45*(4), 721-725. doi: 10.1901/jaba.2012.45-721

Fahmie, T. A., Iwata, B. A., & Jann, K. E. (2015, April). A comparison of edible and leisure reinforcers. *Journal of Applied Behavior Analysis*, *48*(2), 331-343. doi: 10.1002/jaba.200

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

Fueyo, V., Saudargas, R.A., & Bushell, D. Jr. (1975). Two types of feedback in teaching swimming skills to handicapped children. *Perceptual and Motor Skills, 40,* 963-966. doi: 10.2466/pms.1975.40.3.963

Fullerton, E. K., Conroy, M. A., & Correa, V. I. (2009, May). Early childhood teachers' use of specific praise statements with young children at risk for behavioral disorders [Electronic version]. *Education Resources Information Center*, *34*(3), 118-135.

Gable, R. A., & Shores, R. E. (1980). Comparison of procedures for promoting reading proficiency of two children with behavioral and learning disorders. *Behavioral Disorders, 5,* 102-107.

Goetz, E. M., & Baer, D. M. (1973). Social control of form diversity and the emergence of new forms in children's blockbuilding. Journal of Applied Behavior Analysis, 6, 209- 217. doi: 10.1901/jaba.1973.6-209

Goetz, E. M., Holmberg, M. C., & LeBlanc, J. M. (1975). Differential reinforcement of other behavior and contingent reinforcement as control procedures during the modification of a preschooler's compliance. *Journal of Applied Behavior Analysis*, *8*(1), 77-82. doi: 10.1901/jaba.1975.8-77

Hall, R., Lund, D., & Jackson, D. (1968). Effects of teacher attention on study behavior. *Journal of Applied Behavior Analysis*, *1*(1), 1-12. doi: 10.1901/jaba.1968.1-1

Hawkins, S. M., & Heflin, L. J. (2011). Increasing secondary teachers' behavior-specific praise using a video self-modeling and visual performance feedback intervention. *Journal of Positive Behavior Interventions,13*(2) 97–108. doi: 10.1177/1098300709358110

Haydon, T., & Musti-Rao, S. (2011). Effective use of behavior-specific praise: A middle school case study. *Beyond Behavior, (3),* 31-39.

Heal, N. A., Hanley, G. P., & Layer, S. A. (2009). An evaluation of the relative efficacy of and children's preferences for teaching strategies that differ in amount of teacher directedness [Electronic version]. *Journal of Applied Behavior Analysis*, *42*(1), 123-143. doi:10.1901/jaba.2009.42-123

Hemmeter, M.L., Snyder, P., Kinder, K. & Artman, K. (2011). Impact of performance feedback delivered via electronic mail on preschool teachers' use of descriptive praise. *Early Childhood Research Quarterly, 26*(2)*,* 96-109. doi: 10.1016/j.ecresq.2010.05.004

Hopkins, B. L. (1968, June). Effects of candy and social reinforcement, instructions, and reinforcement schedule leaning on the modification and maintenance of smiling. *Journal of Applied Behavior Analysis*, *1*(2), 121-129. DOI: 10.1901/jaba.1968.1-121

Michael, J. (1982). Distinguishing between discriminative and motivational functions of stimuli [Electronic version]. *Journal of Experimental Analysis of Behavior*, *37*(1), 149-155. doi:10.1901/jeab.1982.37-149

Michael, J. (1993). Establishing Operations. *The Behavior Analyst, 16*(2), 191-206.

Moore-Partin, T.C., Robertson, R.E., Maggin, D.M., Oliver, R.M., & Wehby, J.H. (2010). Using teacher praise and opportunities to respond to promote appropriate student behavior. *Preventing School Failure,* 54(3), 172-178.

NAEYC. (2009). Developmentally appropriate practice in early childhood programs serving children from birth through age 8. NAEYC. Copyright 2009. Naeyc.org/positionstatements/dap.

North, S. T., & Iwata, B. A. (2005). Motivational influences on performance maintained by food reinforcement [Electronic version]. *Journal of Applied Behavior Analysis*, *38*(3), 317-333. doi:10.1901/jaba.2005.93-04

Polick, A.S., Carr, J.E., & Hanney, N.M. (2012). A comparison of general and descriptive praise in teaching intraverbal behavior to children with autism. *Journal of Applied Behavioral Analysis, 45*(3)*,* 593-599. doi: 10.1901/jaba.2012.45-593

Reinke, W.M., Lewis-Palmer, T., & Martin, E. (2007). The effect of visual performance feedback on teacher use of behavior-specific Praise. *Behavior Modification, 31*(3), 247-263. doi: 10.1177/0145445506288967

Sandall, S., Hemmeter, M. L., Smith, B., & McLean, M. (2005). DEC recommended practices in early intervention/early childhood special education (2nd edition). Sopris West: Longmont, CO.

Sigafoos J, Doss S, Reichle J. Developing mand and tact repertoires in persons with severe developmental disabilities using graphic symbols. *Research in Developmental Disabilities*. (1989); 10:183–200. doi: 10.1016/0891-4222(89)90006-1

Stevens, C., Sidener, T.M., Reeve, S.A., & Sidener, D.W. (2011). Effects of behavior-specificand general praise, on acquisition of tacts in children with pervasive developmental disorders. *Research in Autism Spectrum Disorders, 5,* 666-669. doi: 10.1016/j.rasd.2010.08.003

Stormont, M., Lewis, T. J., & Covington-Smith, S. (2005, July). Behavior support strategies in early childhood settings: Teacher importance and feasibility ratings. *Positive Behavior Interventions*, *7*(3), 131-139. doi:10.1177/10983007050070030201

Sutherland, K.S., Wehby, J.H., & Copeland. S.R. (2000). Effect of varying rates of behavior specific praise on the on-task behavior of students with EBD. *Journal of Emotional and Behavioral Disorders, 8*(1), 2-8, 26. doi: 10.1177/106342660000800101

Zentall, S. R., & Morris, B. J. (2012, August). A critical eye: praise directed toward traits increases children's eye fixations on errors in decreases motivation [Electronic version]. *Spychon Bull Rev*. doi: 10.3758/s13423-012-0294-y

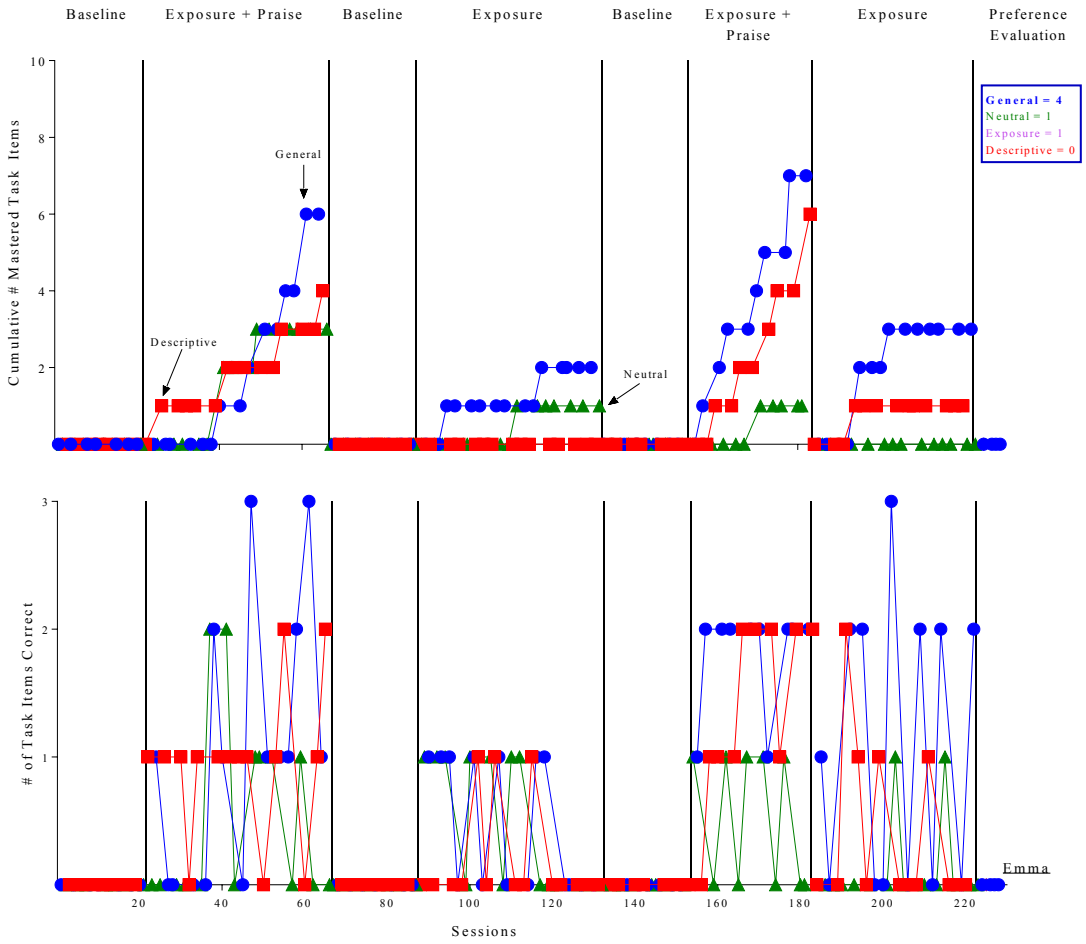

Figure 1. This figure depicts data for Emma. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

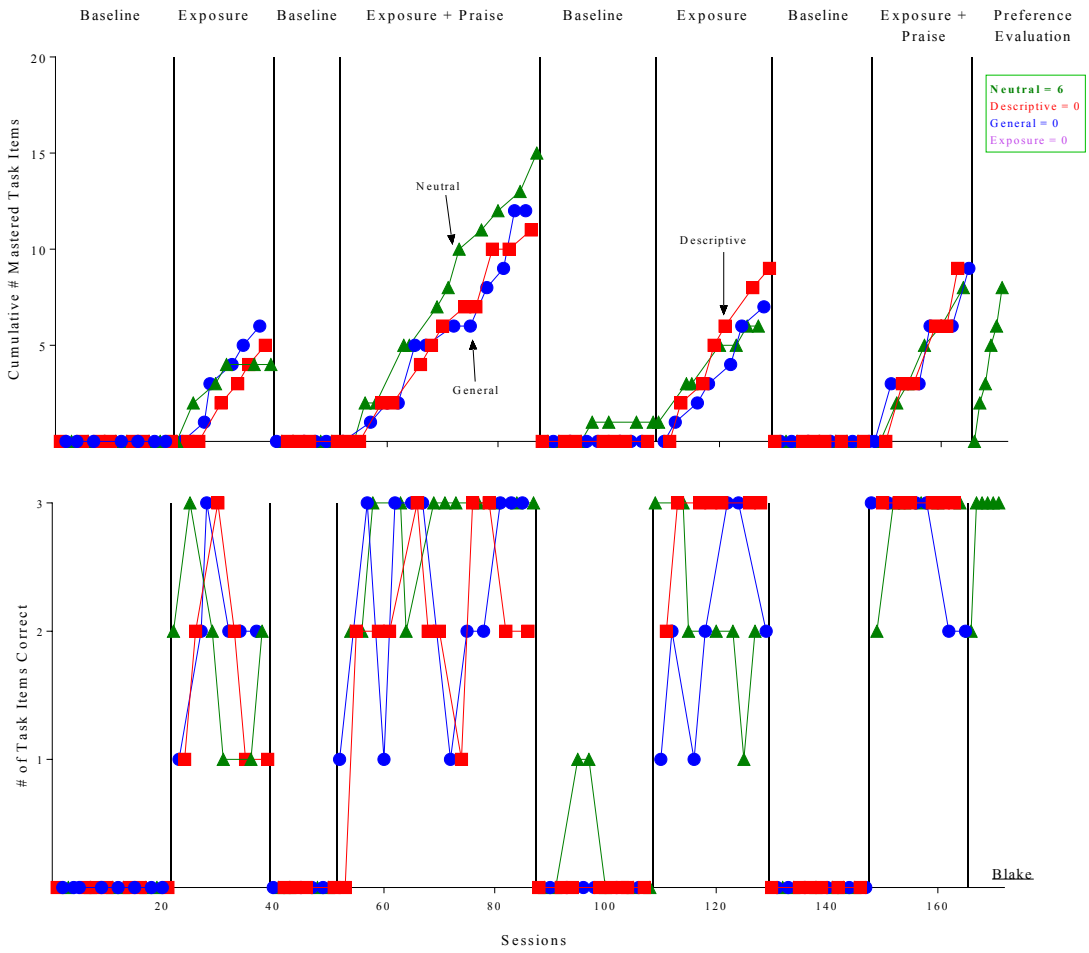

Figure 2. This figure depicts data for Blake. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

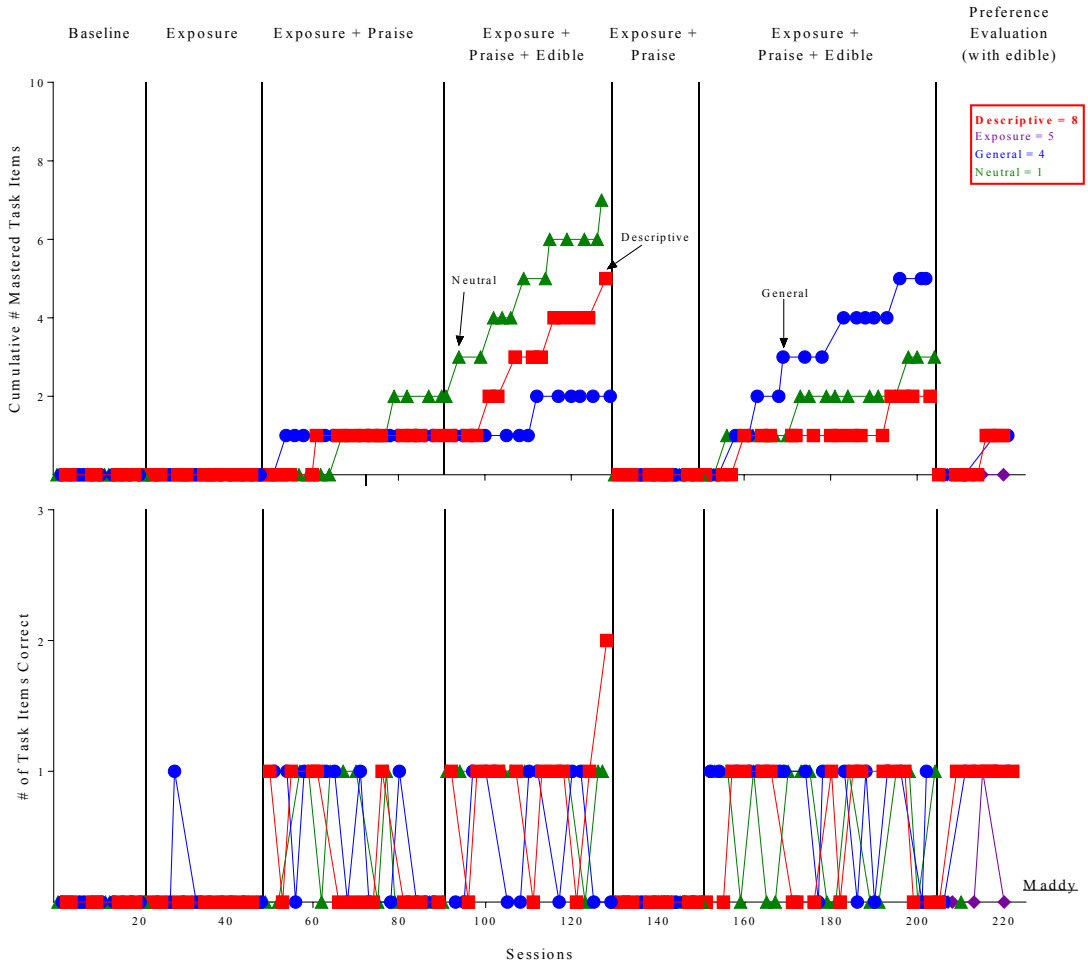

Figure 3. This figure depicts data for Maddy. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

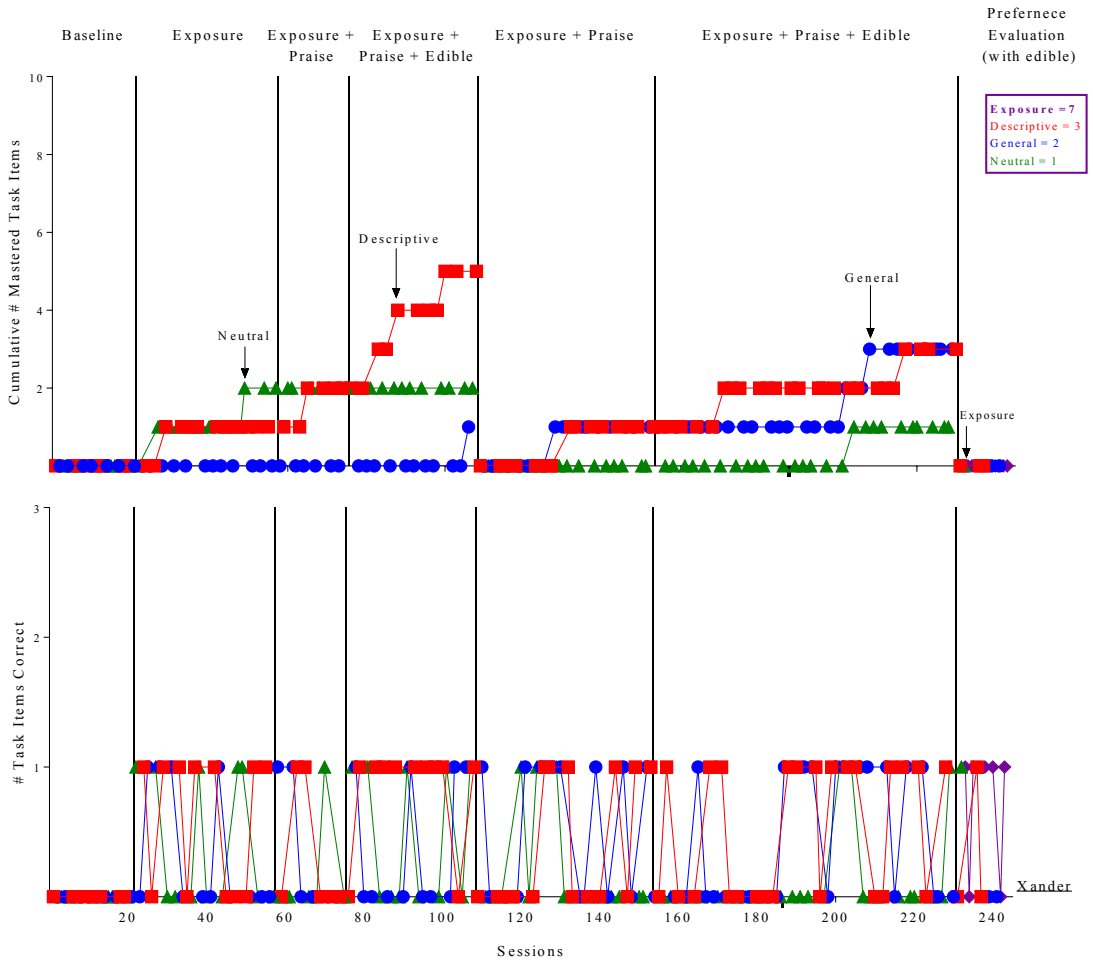

Figure 4. This figure depicts data for Xander. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

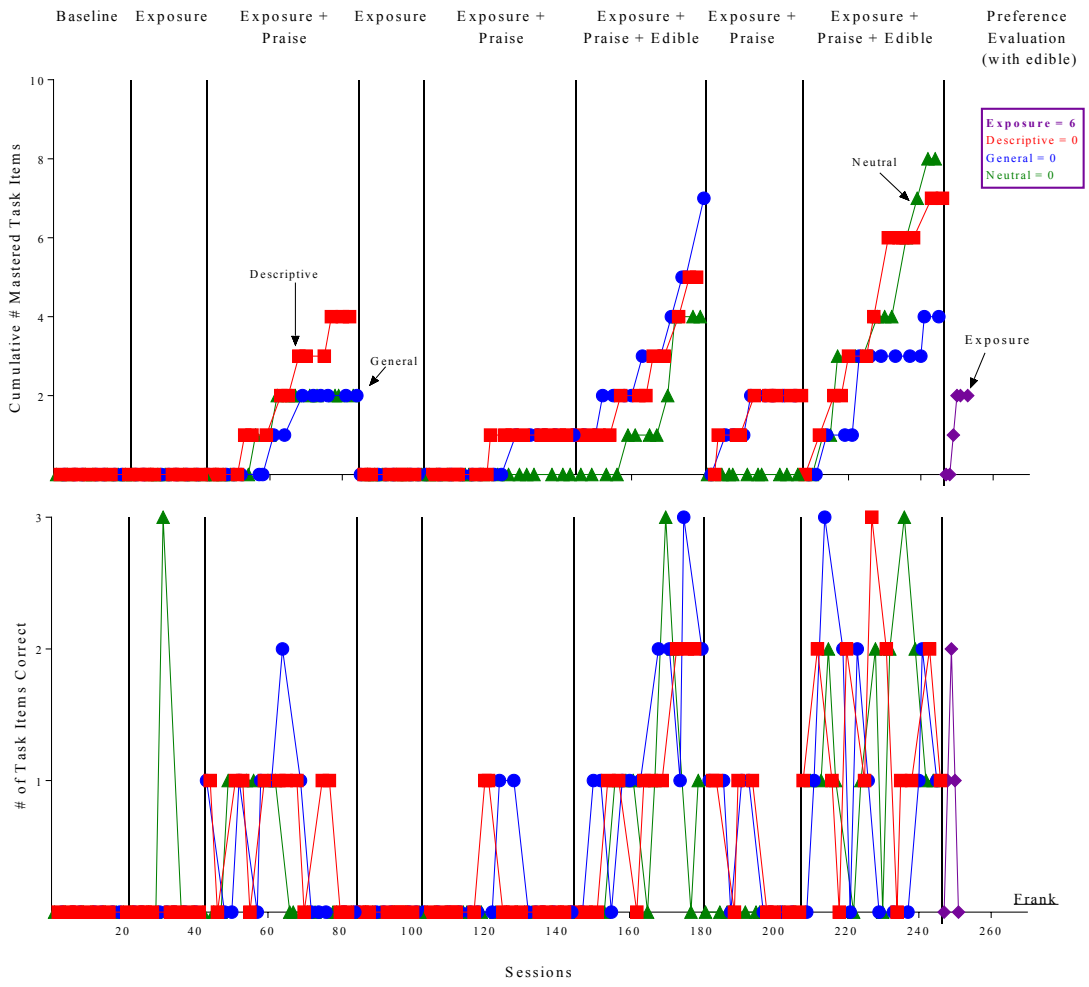

Figure 5. This figure depicts data for Frank. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

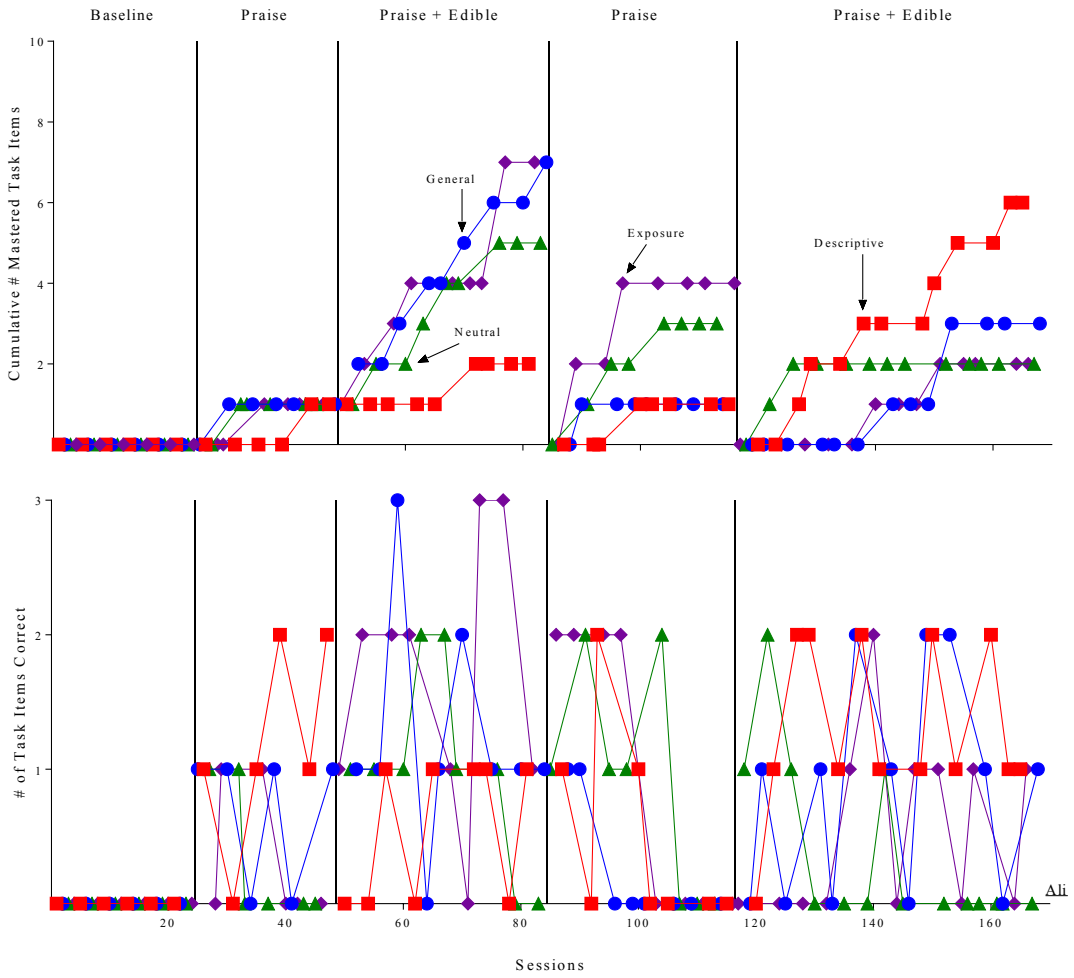

Figure 6. This figure depicts data for Ali. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

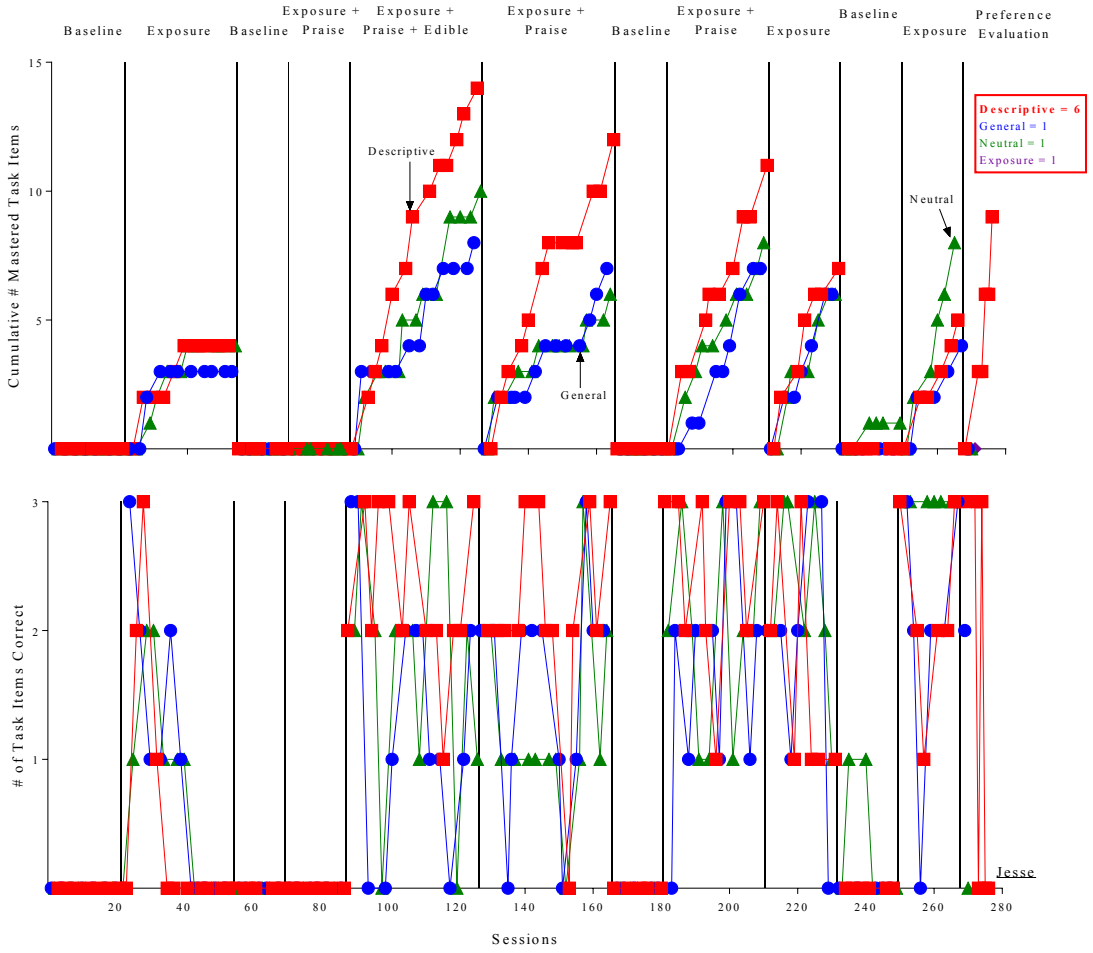

Figure 7. This figure depicts data for Jesse. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

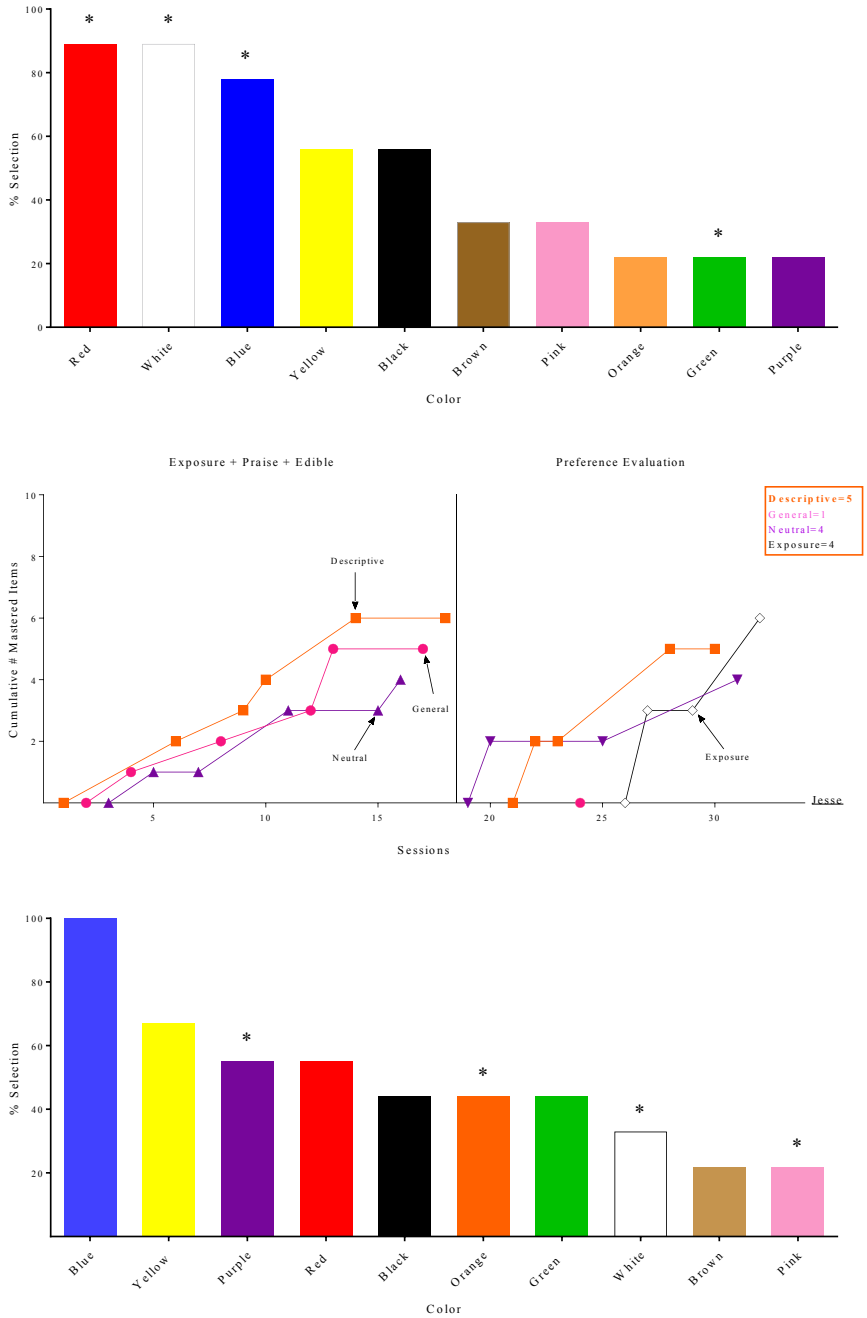

Figure 8. This figure depicts additional analyses conducted with Jesse based on his preference for descriptive praise (i.e., the red condition). The middle panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria with new colors. The top and bottom panels depict the 10-item color preference assessment conducted before (top panel) and after (bottom panel) the manipulation with new colors (middle panel). The asterisks denote the colors that were associated with different conditions of the study.

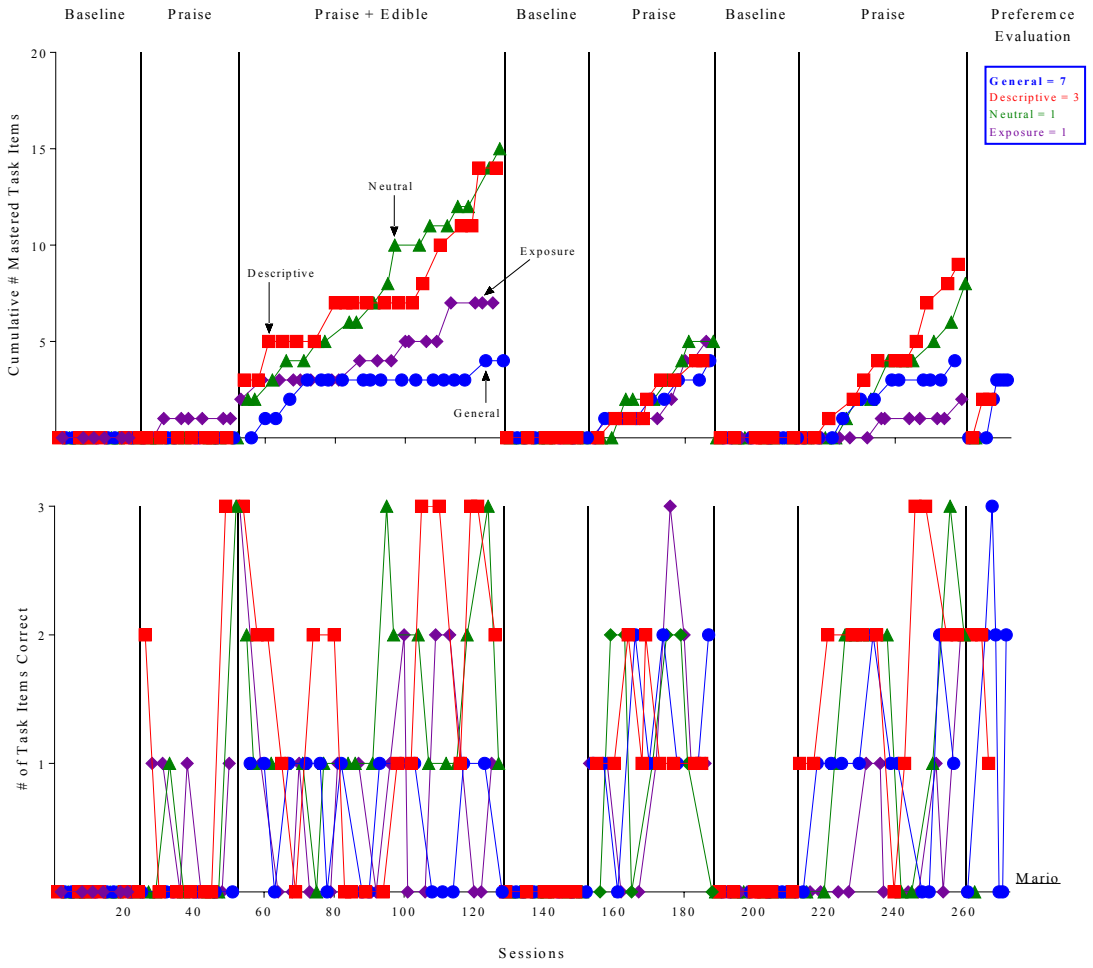

Figure 9. This figure depicts data for Mario. The top panel depicts the cumulative number of mastered task items as per our two-consecutive-sessions-correct criteria. The bottom panel depicts the number of task items correct (all three times in which they were presented) in each session.

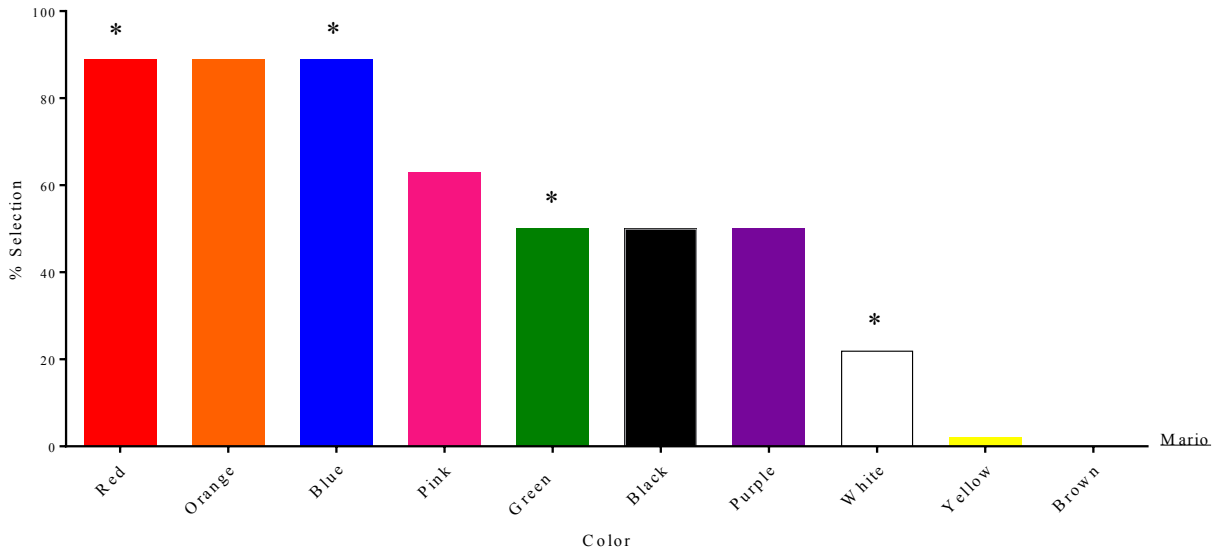

Figure 10. This figure depicts the 10-color preference assessment results for Mario. The asterisks denote the colors that were associated with the different conditions of the study.

Tables

Table 1. Attention Statements

Descriptive Praise Statements

"____'s correct. Great work!"	"Way to say _____!"	"Nice work saying ____!"
"____'s right on. Wow!"	"Wow! ____'s right. Perfect!"	"__'s correct, good friend!"
"Excellent job getting ____!"	"Super job knowing ____!"	"Excellent. __'s right on!"

General Praise Statements

"Amazing. That's it, right!"	"Good work, my friend!"	"Yep, that's it. Great!"
"You're rocking this. Good!"	"Wow. You did it!"	"Good. Very nice Work!"
"You figured it out!"	"Exactly. That's right. Nice!"	"That's correct. Just right!"

Neutral Statements

"Here's another one, friend!	"Let's see what's next!"	"Let's keep moving along!"
"Time to move on!"	"Keep giving me answers!"	"Here's the next one!"
"Next, there's this card!"	"Next one, my friend!"	"We're still doing this!"

Appendix A

Examples of Condition Arrangements

Baseline-or-Exposure Conditions

Descriptive-praise condition

General-praise condition

Neutral-Statements Condition

Appendix B

Example of Preference Evaluation Arrangement