An Investigation of General and Descriptive Praise in Teaching Language to Children with Autism

by

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Abstract

Research has shown that traditional operant behavioral procedures have been effective in enhancing language performance (Lovaas, 1987). In addition, the use of descriptive praise has been widely recommended in the area of language intervention for individuals with autism spectrum disorders (ASDs) (e.g., Leaf & McEachin, 1999; Maurice, Luce, & Green, 1996). However, few published studies have directly evaluated the use of descriptive praise in teaching language to children with ASDs (i.e., Sellers & Higbee, 2009; Stevens, Sidener, Reeve, & Sidener, 2011). The purpose of the study was to expand upon the Sellers and Higbee and Stevens et al. evaluations to further investigate the effects of descriptive versus general praise on the acquisition of language skills in children diagnosed with ASDs.

Results of the study showed that there were minimal, if any, advantages of descriptive praise in acquisition efficiency. In 5 out of 9 comparisons (55%), participants reached mastery faster with descriptive praise; however, the differences were often minor. In 3 out of 9 comparisons (33%), participants met mastery (or failure) in the exact same number of sessions. Only 1 of the 9 comparisons (11%) resulted in faster skill acquisition with general praise, and again, the difference was small. From this investigation it appears that recommendations for using descriptive praise in teaching language to children with ASDs exceed the evidence to support them. Thus, it cannot be confidently concluded that descriptive praise provides a greater benefit than general praise for skill acquisition in children with ASDs, but rather the

effectiveness of descriptive praise (and praise, in general) as a teaching strategy seems to be idiosyncratic.

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List of Abbreviations

ABA	Applied Behavior Analysis
ASD	Autism Spectrum Disorder
EIBI	Early and Intensive Behavioral Intervention

CHAPTER I

An Investigation of General and Descriptive Praise in Teaching Language to Children with Autism

Developmental Disabilities

Developmental disabilities are a diverse group of severe chronic conditions accompanied by social, communicative, neurological, behavioral, or physical impairments (Centers for Disease Control and Prevention [CDC], 2004). A developmental disability is considered *developmental* because delays, disorders, or impairments appear during the human developmental period that usually occurs between birth and 22 years of age (Odom, Horner, Snell, & Blacher, 2007). Individuals with developmental disabilities (e.g., cerebral palsy, intellectual disability, epilepsy, Down syndrome) may experience problems with major life activities such as language, mobility, learning, self-help, and independent living (CDC). While impairments in general intellectual functioning may be associated with and can be markers for developmental disabilities, individuals with developmental disabilities can have average or above average intelligence depending upon the severity and type of disability experienced (Odom et al.). One area of developmental disability that is not always accompanied by deficiencies in intellectual impairment are the autism spectrum disorders.

Autism is a life-long developmental disorder that appears by the age of 3 and is characterized by impairments in social and communicative behavior (e.g., gaze aversion,

mutism, language delays, absence of communicative gestures), as well as the presence of a restricted and repetitive range of behaviors, such as an insistence on sameness in routine and stereotypy (American Psychiatric Association, 2000). Autism (also referred to as autistic disorder), Asperger's syndrome, and pervasive developmental disorder-not otherwise specified constitute what is commonly referred to as the autism spectrum disorders (ASDs) (CDC, 2006). Once thought to be rare, ASDs have recently been estimated to occur in approximately 66 per 10,000 or 1 in 150 people in the United States (CDC, 2007).

Specific biological or biomedical etiologies of ASD have not yet been identified; however, research has suggested that genetic and/or environmental factors may be involved in their development (Nebel-Schwalm & Matson, 2008). To date, a number of therapeutic modalities have been developed for treating symptoms associated with the disorder. These include biological (e.g., use of medications such as risperidone), biomedical (e.g., use of vitamin supplements such as B_6), and behavioral (e.g., use of operant teaching techniques) approaches to treatment (Hanson et al., 2007). While some practices have shown moderate efficacy and safety with some individuals with ASD (e.g., medical use of risperidone), other strategies (e.g., megavitamin therapy) lack the same scientific support (Romanczyk, Gillis, White, & Digennaro, 2008). The approach to ASD treatment that has the strongest research support is early and intensive behavioral intervention (Eikeseth, 2009).

Behavioral Intervention for Autism Spectrum Disorders

Researchers in the 1960s were among the first to demonstrate the potential of operant learning techniques in treating children with autism (e.g., Ferster & DeMyer, 1961; Lovaas, Berberich, Perloff, & Schaeffer, 1966; Wolf, Risley, & Mees, 1964). This research gave rise to the development of comprehensive applied behavior-analytic (ABA) interventions which focus

on targeting specific individualized behavioral objectives, utilizing ongoing data collection to measure and analyze treatment, examining environmental factors that influence behavior, developing function-based procedures for reducing problem behavior, and supervising and evaluating staff to ensure treatment integrity (Faja & Dawson, 2006; Steege, Mace, Perry, & Longenecker, 2007).

Current research on behavioral treatment for ASD suggests that early intensive intervention, begun when a child is between 2 and 5 years old, can have a significant and lasting, positive impact in the majority of children with ASD (Maurice, Green, & Luce, 1996). In addition, researchers have found that beginning behavioral intervention earlier in life (e.g., age 2) may produce greater positive outcomes than in later years (e.g., age 5) (Fenske, Zalenski, Krantz, & McClannahan, 1985; Harris & Handleman, 2000). Sometimes referred to as early and intensive behavior intervention (EIBI), this treatment approach is based on the principles of learning (e.g., reinforcement, discrimination, generalization) and it includes skill-based curricula that are hierarchically organized and developmentally sequenced with an intense delivery schedule of one-to-one instruction for up to 40 hrs per week over several years (Love, Carr, Almason, & Petursdottir, 2009).

Although applications of ABA methods for children with autism began in the 1960s, EIBI for autism gained notoriety when Lovaas (1987) treated children with autism intensively with ABA for several years and found significant improvements in 47% of the children receiving treatment. A number of large-n EIBI outcome studies have since been published. These studies have documented improvement in ABA-treated groups compared to control groups not receiving the high-intensity intervention (Sherer & Schreibman, 2005). Other studies have also reported significant gains when children with ASD were treated intensively with ABA at an early age

(e.g., Eikeseth, Smith, Jahr, & Eldevik, 2007; Harris, Handleman, Gordon, Kristoff, & Fuentes, 1991; Remington et al., 2007), when ABA was provided at low-intensity levels (12 hrs per week) (Eldevik, Eikeseth, Jahr, & Smith, 2006), and when intensive intervention was provided with older children aged 4 to 7 years (Eikeseth, Smith, Jahr, & Eldevik, 2002). In addition to these empirical efforts, multiple treatment and assessment manuals have been developed that outline EIBI strategies for young children with autism for disseminating the technology to parents and professionals (e.g., Leaf & McEachin, 1999; Lovaas, 2003; Maurice et al., 1996; Sundberg, 2008; Sundberg & Partington, 1998).

Overall, the application of ABA-based treatment has been shown to increase communicative, social, play, cognitive, and other skills in children with ASD as well as reduce serious behavioral excesses, such as self-injurious behavior and aggression (Schreibman & Anderson, 2001). It is now widely acknowledged that, to date, the forms of treatment for ASD with the broadest empirical validation for effectiveness are based upon ABA (Schreibman, 2000). Behavior-analytic intervention programs have been so successful in ASD treatment that in 1999 the Surgeon General of the United States concluded that ABA was the treatment of choice for children with ASD (Rosenwasser & Axelrod, 2001). Furthermore, the results of a recent meta-analysis of EIBI programs found significant improvements in intelligence and adaptive-behavior scores after receiving intensive ABA treatment across a number of well-designed studies, providing further evidence that EIBI should be the intervention of choice for children with ASD (Eldevik et al., 2009).

Essential Components of Early and Intensive Behavior Intervention

While hundreds of studies have demonstrated the effectiveness of behavioral procedures in building important skills and reducing problem behaviors with individuals with autism, it is

possible that the implementation of EIBI by therapists in different settings (e.g., schools, clinics, special education classrooms) may vary (McClannahan & Krantz, 2004). Thus, researchers have begun investigating common elements found in EIBI. Early and intensive behavior intervention programs generally include the following important components: (a) intervention at an early age (before 3.5 years); (b) individualized and comprehensive intervention that addresses all skill domains (based on assessments of current skill levels); (c) use of behavioral procedures to build new skill repertoires and reduce interfering behavior (e.g., differential reinforcement, prompting, discrete-trial instruction, incidental teaching, activity-embedded trials); (d) one or more therapy agents with advanced training in ABA and experience with autism; (e) selection of intervention goals and objectives guided by developmental sequences; (f) parents serving as co-therapists with their children; (g) 1:1 intervention delivered with transitions to group instruction; (h) intervention beginning in the home with transition to community and school settings; (i) intensive, year-round programming with 20 to 30 hrs per week of structured sessions; and (j) duration of treatment of about 2 or more years (Green, Brennan, & Fein, 2002; Eikeseth, 2009; Eldevik et al., 2009).

McClannahan and Krantz (2004) also provided a view into the essential components of EIBI. According to McClannahan and Krantz, practices that contribute to EIBI success include: (a) providing the child the opportunity to engage in activities and with other people; (b) providing the child multiple opportunities to respond to instructional stimuli across settings and with multiple instructional strategies; (c) using descriptive praise contingent upon correct responding; (d) building relationships by pairing therapists with reinforcement; (e) including programs focused on hygiene and self-help skills; (f) working on social skills; (g) developing

prevention strategies for problem behavior; (h) involving the child's family in intervention; and (i) intervening at an early age and at a high intensity.

Although EIBI is well researched and demonstrated to be effective, it appears that researchers differ in determining its essential components. Perhaps these differences are due to a number of variations in treatment priorities and procedures that have developed during the widespread dissemination of EIBI (Love et al., 2009). Love et al. surveyed 211 supervisors of EIBI programs to determine specific clinical practices in use across providers. The authors found the majority of program supervisors reported using more than one EIBI treatment manual for developing their program curricula, suggesting that no single EIBI manual met all program needs. In addition, they found a number of other differences across providers, including the use of preference assessments, task interspersal methods, the involvement of parents, and the setting in which services were provided (e.g., home, school, clinic). Thus, it is evident that EIBI programs employ a number of different techniques, and researchers and clinicians may hold different views about which components are most important to the overall enterprise. However, one EIBI component that appears to be used consistently across settings and providers is the reinforcement of adaptive behavior. One type of reinforcer commonly recommended for use in EIBI programs is praise (McKlannahan & Krantz, 2004).

Praise as an Important Teaching Component

From the science of behavior, it is well understood that reinforcement is necessary for individuals to acquire new behavior (Heflin & Alberto, 2001). Therefore, it is no surprise that praise, a potential form of social reinforcement, is a common element of most teaching strategies often employed by teachers, parents, peers, and employers following a desirable behavior (Dozier, 2006). According to Brophy (1981), to praise means to "commend the worth of or to

express approval or admiration" (p.5) while expressing a positive affect (showing delight) and/or giving information to a person about the value of his behavior.

Early applications of praise showed its utility in increasing appropriate behavior of disruptive students (e.g., Hall, Lund, & Jackson, 1968) and increasing task engagement with children in general education classrooms (e.g., Broden, Bruce, Mitchell, Carter, & Hall, 1970). Later studies evaluated praise with students with emotional and behavioral disorders (e.g., Sutherland, Wehby, & Copeland, 2000), learning disabilities (e.g., Alber, Heward, & Hippler, 1999), and developmental disabilities (e.g., Craft, Alber, & Heward, 1998; McGee, Krantz, & McClannahan, 1984). The main focus of recent studies (e.g., Alber et al.; Craft et al.) has been on increasing a teacher's use of praise because earlier studies reported that regardless of support for the use of praise in classrooms, teachers were found to provide low rates of praise across several studies (range = 0.2 to 4.4 per hr) (Brophy, 1981).

Praise has been referred to as a naturalistic, cost effective, and nonintrusive intervention for increasing appropriate behavior (Sutherland et al., 2000). In addition to its effectiveness in teaching the populations mentioned above, studies have demonstrated that utilizing praise can increase a number of both academic and social behaviors (either used in isolation or in conjunction with other strategies such as a token economy). For example, praise has been shown to contribute to increases in work productivity and accuracy (Craft et al., 1998), verbal behavior (Sigafoos, Doss, & Reichle, 1989), academic performance (Good, Eller, Spangler, & Stone, 1981), on-task behavior (Ferguson & Houghton, 1992), student attention (Broden et al., 1970), positive self-statements (Phillips, 1984), social skills (Foxx, McMorrow, & Schloss, 1983), and self-initiated behavior (Rigsby-Elderidge & McLaughlin, 1992). From these studies, it appears

that praise can be a critical component of teaching interventions for many students for whom praise functions as a reinforcer (Keller, Brady, & Taylor, 2005).

Types of Praise

Researchers have distinguished between two types of praise statements, descriptive and general, in order to further evaluate the use of praise in teaching. *Descriptive* praise refers to a praise statement that identifies to the learner the behavior for which he is being praised[1] (Reinke, Lewis-Palmer, & Martin, 2007). *General* praise refers to a verbal praise statement that does not specify to the learner the desired behavior for which he is being praised (Sutherland et al., 2000). According to Wright (2008), the main components of a descriptive-praise statement include (a) gaining the student's attention, (b) recognizing the appropriate behavior, and (c) providing the praise statement. These components are necessary for a social interaction to qualify as descriptive praise or else the statement becomes a general-praise statement.

The difference between the two types of praise is illustrated in the following example. If a teacher would like Johnny to raise his hand more often to answer questions, she could praise him immediately after he raises his hand to answer a question. To use descriptive praise, the teacher could say "Good job raising your hand to answer the question, Johnny." To use general praise the teacher could say "Good job, Johnny." The defining difference between the two statements is that the general praise statement is nonspecific compared to the descriptive praise statement.

The majority of studies have evaluated general, rather than descriptive, praise. In fact, all of the studies previously cited employed general praise. However, there do exist a few examples of research on descriptive praise. For example, Sutherland et al. (2000) examined the rates of a teacher's use of descriptive praise with a classroom of nine students with emotional and

behavioral disorders. The authors found that students' on-task behavior increased when the teacher's descriptive praise increased and decreased with the removal of descriptive praise, suggesting that descriptive praise was an effective component of the teacher's instructional approach. Novak and Hammond (2001) evaluated the use of descriptive praise in conjunction with a self-reinforcement token economy on reading performance of children in a fourth-grade general-education classroom. Upon completing a reading problem, students were given a detailed description of a job well done and of future consequences for their performance, such as "You sure got a lot correct. You should get a good grade in reading this term." Results showed that using descriptive praise in conjunction with the token economy resulted in greater academic gains compared to using the token economy alone in which tokens were delivered by either the teacher or the student (i.e., self-administered).

Chalk and Bizo (2004) investigated the effects of descriptive praise and positive praise (i.e., any kind of praise descriptive or general) on student on-task behavior, academic self-concept, and task enjoyment with four classrooms of 109 children in both general and special education. The results of the study showed that both student on-task behavior and academic self concept (as measured by the "Myself as Learner" scale) were increased during both the descriptive praise and positive praise conditions with a slightly greater increase when teachers were instructed to give descriptive praise. However, the authors found no effect of type of praise on the enjoyment ratings made by the students. Finally, Wright (2008) assessed the effect of adding descriptive praise to the Good Behavior Game and reported that the addition resulted in slightly greater on-task behavior of students across five elementary education classrooms.

Based on the assumption that descriptive praise does increase desirable behaviors, other studies have investigated ways to increase teachers' use of descriptive praise. Research has

shown that teachers' descriptive praise statements can be increased using an audiotape self-evaluation intervention (Keller et al., 2005), using visual performance feedback (Reinke et al., 2007), and by teaching the students to recruit descriptive praise from their teacher (Alber et al., 1998; Craft et al., 1998).

Very few studies have evaluated descriptive praise with children with ASD; those that have included descriptive praise as a component of a treatment package. For example, McGee et al. (1983) included descriptive praise in a modified incidental teaching package and found increases in newly acquired language skills. In addition, Brown, Krantz, McClannahan, and Poulson (2008) used descriptive praise as part of a script-fading procedure that was shown to successfully teach scripts to children with ASD who attended community-shopping trips. Although descriptive praise may have been a critical component of these packages, the exact utility of descriptive praise with learners with ASD has not yet been clearly evaluated.

Overall, studies have showed some utility of using descriptive praise in a number of educational contexts, yet research specifically evaluating descriptive praise is particularly lacking. In comparison, there are a greater number of studies investigating general praise than descriptive praise. Despite the lack of evidence, recommendations for using descriptive praise flourish, especially those that suggest it is superior to general praise.

Recommendations to use Descriptive Praise

In comparison to descriptive praise, general praise may be perceived as vague and insincere and researchers have reported that identifying the performed behavior is an important component of effective praise (Brophy, 1981). Brophy reviewed the use of praise by teachers and derived several guidelines for using effective praise. His primary recommendations for delivering praise were to "specify the particulars of the accomplishment" being praised and to

provide “information to students about their competence or the value of their accomplishment” (p. 26). Alternatively, he stated that ineffective praise was characterized by global positive reactions, bland uniformity, and no information at all about performance. Thus, Brophy strongly recommended using descriptive praise over general praise during instruction and his assertion has been widely cited by other researchers (Chalk & Bizo, 2004; Keller et al., 2005; Shute, 2008; Sutherland et al., 2000).

In a review of evidence-based practices for classroom management, Simonsen et al. (2008) recommended that teachers should use a continuum of strategies to acknowledge appropriate behavior in the classroom. One of these was the use of specific, contingent praise because “the effects of praise may be bolstered when the praise is specific (i.e., describes the desired behavior) and used in conjunction with other strategies” (p. 363). Similarly, Heflin and Alberto (2001) recommended that reinforcement be specific to a response when teaching individuals with ASD, implying that descriptive praise would be more appropriate than general praise for teaching new skills to this population.

Recommendations for the use of descriptive praise over general praise are prevalent in the ASD literature, in particular among EIBI manuals and web sites related to ASD and ABA. In a popular EIBI manual, Leaf and McEachin (1999) recommended the following in regards to using descriptive praise (referred to as “labeling behavior”):

> In early teaching, label the behavior that is being reinforced. This helps your child understand the behavior that is being reinforced and that you would like him to repeat. It also strengthens the connection between the reinforcer and the behavior. Labeling the behavior serves as a prompt for yourself as the teacher, keeping you focused on the

> purpose of trials. Later on it will be less important to specifically label the behavior because your child will be able to understand the contingencies. (p. 33)

Another example can be found in a chapter by Anderson, Taras, and Cannon (1996) that can be found in another popular clinical manual (Maurice et al., 1996):

> Praise is the most natural, convenient, and universal reinforcer that you can use. Unfortunately praise is not naturally reinforcing to many children with autism. Nevertheless by providing it simultaneously with the delivery of small portions of food or other reinforcing consequences, it also may gain reinforcement value to the child. Make your praise statement very specific and descriptive of the target behavior (e.g., "Good sitting" vs. "Good boy"). (p. 187)

In addition to recommendations found in EIBI manuals, a number of web sites advocate for descriptive praise compared to general praise. For example, the Behavior Analysis Association of Michigan website (n.d.) provides an example of how descriptive praise may be commonly explained to parents, teachers, or professionals:

> Descriptive praise is better than simple praise because it increases the duration and quality of the praise, and identifies the behavior being reinforced. By using the person's name, you increase the chances that the person will notice that you are delivering a verbal reinforcer and directly engage with you. If you are reinforcing the behavior of a person who is non-verbal, the descriptive praise will attach verbal labels to the activity, perhaps teaching the person more words. Even a completely non-verbal person will benefit. Longer social contact is likely to be more reinforcing than a brief contact (even if the person doesn't understand).

It is evident that descriptive praise is widely recommended over general praise and this notion has become what appears to be a natural assumption of EIBI practice. However, all recommendations for descriptive praise over general praise have been made without sufficient evidence to support them; thus, questions remain about the scientific basis of the recommendation for descriptive over general praise.

The Scientific Basis of Descriptive Praise Recommendations

As mentioned previously, it appears that the most salient recommendation for using descriptive versus general praise originated with Brophy (1981). However in his research review, Brophy cautioned his readers that most of the data he reviewed were correlational and that inferences he made regarding the effectiveness of praise were often drawn from teachers' and students' thoughts and behavior rather than direct evidence. He referred to his paper as a "logical analysis based on integration of a broad range of indirect data and not an empirical" analysis of praise (p. 25).

Although Brophy (1981) did not have direct evidence to support his recommendations, the notion of descriptive praise being superior to general praise is commonplace, even today (e.g., Shute, 2008). However, few studies have directly evaluated the use of descriptive praise versus general praise in an educational context (and even moreso with children with developmental disabilities). As mentioned previously, Chalk and Bizo (2004) evaluated different types of praise, but weaknesses of their study (e.g., unclear differentiation of descriptive versus general praise, lack of treatment integrity measures, and the inclusion of only four observations per teacher) make it impossible to clearly interpret their findings.

Few studies exist (published and unpublished) that have compared the effects of descriptive and general praise (Scheer, 1976; Sellers & Higbee, 2009; Stevens et al., 2010;

Zahler, 1975). Both Scheer and Zahler were unpublished dissertations in which both authors evaluated descriptive and general praise in simple motor tasks and found minimal if any effects of descriptive praise over general praise on student performance (i.e., with typically-developing 4th graders and college students). Recently, Stevens et al. evaluated the effects of descriptive and general praise on the acquisition of tacts with 2 children diagnosed with ASDs (i.e., autism and PDD-NOS). In the study they paired descriptive and general with tokens and prompting and found no differential effects of either type of praise on the acquisition of skills. From their evaluation it is unknown if the type of praise would have had a different effect on learning if presented alone. Sellers and Higbee (2009) evaluated descriptive and general praise with 3 young children with autism and also found no greater effect of either the use of descriptive or general praise on the rate of skill acquisition of receptive actions (i.e., auditory-visual conditional discriminations). Specifically, 2 of the 3 children did not acquire many of the targeted skills demonstrating the type of praise was equally ineffective (or that praise was not an effective reinforcer). The 3rd participant in their study mastered the same number of skills with both types of praise, further showing no difference when learning was achieved.

Purpose of the Current Study

There is a clear need for additional research into the use of descriptive praise with children in an instructional context, in particular those with ASD. From the present review, it appears that recommendations for using descriptive praise with children with ASD as part of an EIBI program have exceeded any evidence collected to support them. The purpose of the present study, therefore, was to investigate the effects of descriptive praise and general praise on the acquisition of language skills of children diagnosed with ASD.

To further investigate general and descriptive praise, the current study expanded upon Stevens et al. (2010) and Sellers and Higbee (2009) in a couple of ways. First, Stevens et al. evaluated the effects of descriptive versus general praise in conjunction with prompting and additional reinforcement (i.e., tokens). They did not directly evaluate the effects of either type of praise in isolation. Thus, the current study included an initial intervention phase of praise alone (either descriptive or general) plus prompting, which was followed by the introduction of additional reinforcement if learning was not achieved. Second, Sellers and Higbee included participants in their study for whom praise did not function as a reinforcer, as evidenced by 2 out of 3 participants' failure to reach skill mastery, and also found no effect of either descriptive or general praise on the rate of skill acquisition for a participant who mastered the same number of targets regardless of praise type. In the current study, an additional experimental condition (i.e., praise plus a highly preferred item) was included for children whom praise may not have been sufficient for increasing language performance in order to further determine any effects of praise type. Third, the participants in Sellers and Higbee were young learners (aged 3 and 4 yrs) with autism who may not have had a sufficient listener repertoire. From a conceptual perspective, one would not expect praise to be an effective reinforcer with young children who lack a strong listener repertoire because they would be unable to benefit from the added language in descriptive praise. Therefore, in the present study we also assessed the use of descriptive versus general praise in teaching language to learners who were young (between 3 to 4 years of age) but had a strong listener repertoire (as determined via direct assessment) in order to determine what effects these types of praise, if any, have on the acquisition of language skills.

CHAPTER II

Method

Participants and Setting

Participants were selected from a local preschool that delivered EIBI services to students with and without developmental delays. Seven preschool students (six boys and one girl) diagnosed with an autism spectrum disorder were chosen to participate in the study based on parental consent and willingness to participate. Greg, Drew, Jesse, Brad, Shaun, Brett, and Tina were 3.7, 4.7, 4.11, 4.8, 3.9, 4.11, and 4.11 years of age respectively at the time of the study. Inclusion in the study required that participants (a) were able to follow simple directions and (b) did not have any significant impairment (e.g., severe problem behavior or limited verbal ability) that could hinder their participation in the study. Of the 7 children who enrolled in the study, 4 participants (Brad, Shaun, Tina, and Brett) completed the study. The other participants did not finish the experiment due to switching schools and/or meeting exclusionary criteria after beginning the study (e.g., severe problem behavior).

All experimental sessions were conducted in a small therapy room at the pre-school 3 to 5 days per week with an experimenter, a research assistant, and the participant present. The room contained a table, two large cabinets, and three chairs. The materials necessary for conducting a session (i.e., a video camera and data sheets) were set up in the room prior to participant entry. All instruction given during a session consisted of one-to-one teaching that took place seated at a table or sitting on the floor. The

experimenter conducted multiple trials per session and session duration was determined by the duration of time to complete nine trials. More than one session was conducted within an experimental visit and visits lasted 30 to 60 min. Sessions continued until a) the participant mastered the skill sets or b) until the participant reached 3 failures (as described in the procedures section below). In total, the study was conducted over a nine month period, with participants taking part in sessions for 12 to 20 weeks each.

Data Collection

Throughout the study, each participant was exposed to sessions consisting of language trials in which the child was given an instruction (the discriminative stimulus, S^D) and data were collected on the participants' responses emitted after the S^D during each trial. Each response was scored as correct, incorrect, or "no response." A sample data sheet is depicted in Appendix A. A *correct response* was defined as the participant responding correctly and independently (without prompting) to the instruction within 5 s. All *incorrect* or *non-responses* within 5 s resulted in the presentation of a least-to-most prompting sequence (described later). All responses were manually recorded on a data sheet immediately after the participants' responses were emitted or up to 5 s after the participant was given the opportunity to emit a response (for prompted or non-responses only).

One skill set was assessed during each session. A skill set consisted of three specific language targets (i.e., intraverbals) presented for 3 trials each. Thus, each session consisted of 9 trials. Two dependent measures were derived from the data collected. The first was the percentage of correct responses per target skill set per session and the second was the number of sessions to reach the mastery criterion per target set (defined as three consecutive sessions at 89% correct or better across two consecutive visits).

Interobserver Agreement

Interobserver agreement (IOA) was assessed for 33%, 37%, 48%, and 33% of the treatment-evaluation sessions for Brad, Shaun, Tina, and Brett respectively. To facilitate IOA, experimental visits were video recorded and later scored by a second trained observer. These data were compared to the in-vivo data collected by the experimenter who conducted the session to calculate point-by-point agreement (i.e., video data to live data; see Appendix B). An agreement was defined as the two independent observers agreeing on the events that occurred during the session (e.g., the participants' responses and the prompts given by the experimenter). Interobserver agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and converting the ratio to a percentage. The mean and range of IOA scores for each participant were as follows: Brad 97% (range, 85-100%), Shaun 100% (range, 100-100%), Tina 98% (range, 89-100%), and Brett 100% (range, 100-100%). **Procedures**

Initial assessments. The experimenter conducted four initial assessments with each participant prior to the experimental evaluation. First, a stimulus preference assessment was conducted to identify preferred items and activities that could serve as reinforcers to be used in the experiment. Second, a language assessment was used to determine each student's eligibility to participate in the study along with their current language abilities. Third, a reinforcer assessment was conducted to evaluate the effectiveness of praise as a reinforcer. Fourth, skill probe assessments were used to determine specific language skill targets to teach during the study. All assessments took place in the same location as the experimental sessions and included the same personnel.

Stimulus preference assessments. Upon receiving parental consent for research participation, a stimulus preference assessment was conducted with each participant. Interviews were conducted with the participants' parents, therapists, or teacher to identify potentially preferred toys and leisure items that could be further assessed during a subsequent direct-observation preference assessment. After potentially preferred items were identified, a subset of them were then included in a brief multiple-stimulus without replacement (MSWO) preference assessment (Carr, Nicolson, & Higbee, 2000).

During the MSWO assessment, toys from both the interviews and novel classroom toys were arranged in a semi-circle on the floor in front of the child. The child was directed through the array and all toys were introduced and demonstrated. The child was then instructed to select a toy by the experimenter instructing him to "Pick one," or asking "What do you want?" If the child failed to respond within 5 s the instruction was repeated and any attempt to pick more than one item was blocked. Upon making a choice, the participant received access to the selected item for up to 30 s and the experimenter recorded the selection on a data sheet (see Appendix C). When an item was chosen it was removed from the array and the remaining items were rearranged quasi-randomly. A second trial then took place during which the child was asked to select another item. The trial ended with access to the item chosen for up to 30 s and removal of that item as described above. Trials were repeated until all items were selected or until the child stopped selecting. The entire MSWO procedure was repeated two additional times to determine each child's relative preferences among the included items. The results of the MSWO preference assessment were used to select items to include in the experiment during play breaks between sessions and the entire assessment was completed within one experimental visit.

Language assessment. The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) (Sundberg, 2008) was used to assess each child's language skills. The VB-MAPP is a comprehensive criterion-based language assessment that allows a tester to identify language abilities based on Skinner's (1957) analysis of verbal behavior. The VB-MAPP was either reviewed (if completed within 1 month of beginning the study) or conducted by the experimenter. The VB-MAPP was used to determine if the participant met criteria for continuing in the study and it also aided in determining the child's language skill areas in need of further instruction. During visits in which the VB-MAPP was completed the experimenter directly assessed areas of the VB-MAPP with the participant during brief 5-min sessions with play breaks in between.

In each VB-MAPP trial, the child was given an instruction (the S^D) and data were collected on the participants' responses emitted after the S^D. Each trial was scored as correct, incorrect, or "no response" and the child's responses were coded according to the point values given in the VB-MAPP protocol. The results of the VB-MAPP are scored against three developmental levels (Level 1: 0-18 mos., Level 2: 18-30 mos., Level 3: 30-48 mos.). For the present study, the experimenter used the VB-MAPP to evaluate the following repertoires: listener responding (following instructions), echoics (vocal imitation), and intraverbals (elementary conversational skills).

Upon completion of the assessment, the experimenter was able to determine that all participants (Brad, Brett, Shaun, and Tina) were eligible to take part in further phases of the study. The participants' performance in a remaining area of the VB-MAPP (intraverbals) was later used to determine target skill sets to teach each child during the experimental visits.

Reinforcer (praise) assessment. To assess whether praise functioned as a reinforcer for the children's behavior, each participant was instructed to engage in a simple task unrelated to the other tasks in the experiment. The responses targeted for this assessment were a) placing a plain white sticker (i.e., an adhesive paper reinforcement label) on a piece of construction paper for Brad, Tina, and Brett and b) putting blocks in a box for Shaun. Responses were reinforced on a progressive ratio (PR) 1 schedule. See Appendix D for a sample data sheet. In the praise assessment three different conditions were assessed using a multielement design. The first condition was a general praise condition in which the participant was provided a general praise statement ("Good job") when the schedule requirement was met. The second condition was a descriptive praise condition in which the participant was provided a descriptive praise statement ("Good job putting the sticker on the paper") when the schedule requirement was met. The third condition was a no-praise condition which served as a control condition because no programmed consequences were delivered for responding. Each session began with the experimenter modeling the required response (putting a sticker on a piece of paper for Brad, Brett, and Tina and putting a block in a box for Shaun) and providing a verbal instruction "Do this." Programmed responses were then delivered per the experimental condition. Sessions ended (a) after 5 min had elapsed), (b) until the participant made four attempts to leave his or her seat, or (c) after 2 min of no responding elapsed.

Skill probe assessment. Using the VB-MAPP as a basis of skill level, the experimenter developed several skill lists per child (consisting of multiple intraverbal targets) that were equated for syllable length and then assessed which of the skills in the lists were or were not in the child's repertoire by providing an opportunity to perform each skill in the set (see Appendix E for a sample data sheet). These probe sessions took place in a loosely structured one-to-one

teaching context either seated at a table or on the floor, or during play breaks where the child was given free access to toys with trials presented intermittently during play. Probe session visits lasted between 30 and 60 min in duration and multiple trials were conducted per session.

During each probe trial, the experimenter presented the instructions necessary for the child to complete each skill target (e.g., asked "What animal says 'Moo'" for assessing an intraverbal skill). If a child was able to independently complete any skill in the skill set (e.g., said "cow" when asked "What animal says 'Moo'") it was removed from the probe list and new skills were targeted and probed in the same fashion (e.g., "What animal says 'Quack'"). During each probe an instruction was presented and data were collected on the child's response (correct, incorrect, or no response). The consequence provided for both a correct and incorrect response was a nonspecific statement redirecting the child to the next trial (e.g., "Let's try this one" or "Now it's time to try this"). If the child made no response, the experimenter waited 5 s before providing a verbal redirection to the next trial.

The skill-probe trials were presented quasi-randomly until 18 skill targets were identified as not being in the child's repertoire (i.e., the child could not answer correctly; required a minimum of 54 total trials). The criteria for determining which skills could not already be performed by the child were 3 consecutive probes in which the child could not independently emit the response or emitted an incorrect response. When all six three-stimulus sets were identified, baseline sessions began.

Treatment evaluation. After the initial pre-experimental assessments were completed, each participant took part in an experimental treatment evaluation to determine whether the type of praise would have an effect on the acquisition of language skills.

Experimental design. To assess the effects of general and descriptive praise on skill acquisition, an adapted alternating treatment design (AATD) (Sindelar, Rosenberg, &Wilson, 1985) embedded within a multiple-probe design (for within-participant replication) was used. An AATD requires that two equivalent sets of instructional targets be taught with two different instructional strategies rather than applying multiple interventions to the same response class as in a traditional alternating treatments design. Target skill sets were equated for difficulty (i.e., required verbal responses were equated for syllable length) and each skill set was taught using either general or descriptive praise in addition to a least-to-most prompting procedure.

The AATD embedded within a multiple-probe design consisted of teaching different target skill sets to each participant. All participants had six skill sets chosen for the study (see Table 1). Target sets were presented in pairs of two (one for each praise intervention) in the AATD with baseline levels established for all pairs of sets concurrently. The introduction of the two teaching interventions (general and descriptive praise) began with the first pair of sets while baseline sessions continued to be probed for the other existing target sets. After the first set of skill targets showed a marked increase in acquisition (as determined by visual inspection of graphical data), the teaching interventions were then introduced with the second pair of target sets and so on. For all target sets, teaching continued until criteria were met for mastery or failure (described below).

***General session structure*.** Each session assessed performance for one target skill set at a time and included 3 trials for each target skill in the set for a total of 9 trials. Between sessions the participant was provided a play break of 1 min during which he or she had access to moderately preferred toys and items as identified from his stimulus preference assessment. After

the play break, another session was conducted assessing either the same or a different target set. The order of presentation of the target sets was determined quasi-randomly

Baseline. For all target sets, baseline sessions consisted of the presentation of trials in which an S^D was provided (e.g., an instruction such as "What animal says 'Moo'?") followed by the presentation of a programmed consequence for the participant's response. In baseline the consequence for responding consisted of a verbal redirection (not a praise statement) to the next trial (e.g., "Let's move on" or "Time to try this"). If a participant provided no response immediately after the S^D was presented, the experimenter waited 5 s before redirecting to the next trial.

Prompting plus praise. During this condition, two target skill sets were taught using two separate prompting plus praise strategies. Sessions were conducted in the same manner as described in baseline except for the programmed consequences that followed the participants' responses. In the prompting plus praise condition the consequence for correct responding (provided immediately) or prompted responding (provided after prompting/error correction) consisted of an excited praise statement. When the praise strategy consisted of general praise, the praise statement included an enthusiastic statement unrelated to the target response (consisting of two words), such as "Good job!" or "Great job!" When the praise strategy consisted of descriptive praise, the excited praise included a statement related to the target response that reiterated what the child did correctly, such as "Great job saying cow!" or "Good job saying horse!"

If in either praise condition a participant provided no response or an incorrect response immediately after the S^D was presented, the experimenter implemented a least-to-most prompting procedure in which the experimenter waited 5 s for a response before providing the S^D

again in conjunction with a verbal prompt. The first prompt was a partial-word verbal prompt in which part of the correct word was provided as the prompt (e.g., saying "c-" for cow). If the child did not respond within 5 s after the partial-word prompt a full-word verbal prompt was provided, which consisted of providing the full correct word as the prompt (e.g., "cow"). A differential reinforcement procedure was included in this procedure in which correct responses given after the partial-word prompt resulted in the same general or descriptive praise statement as mentioned above and correct responses after full-word prompts resulted in no programmed consequence and the start of the next trial.

The prompting with praise condition continued until both target sets reached mastery criterion (89% correct or better for three consecutive sessions over two visits) or until both target sets reach the failure criterion, which was defined as 10 consecutive sessions with no increasing trend. In instances where one set reached mastery before the other set, sessions ceased for the mastered set but continued with the nonmastered set until that set either reached the mastery or failure criterion. If both target sets reached the failure criterion, a new phase was introduced.

Prompting with praise plus a highly preferred item (Brett and Tina). If a participant met the failure criterion in the first intervention phase, it could have been that social praise was not an effective reinforcer. Therefore, a new phase was implemented in which highly preferred toys were added to the prompting plus praise intervention (for Brett and Tina). The pairing of highly preferred items was used because it is a commonly recommended EIBI strategy (e.g., Lovaas, 2003; Partington, 2006). In this condition, trials were conducted in the same manner as described above for the general and descriptive praise strategies with a few exceptions. Prior to each visit, a brief 1-array MSWO preference assessment (Carr et al., 2000) was conducted to identify items that were highly preferred for that day's visit (see Appendix F for a sample data sheet). The

highly preferred items were then provided in conjunction with the praise statements contingent upon correct responding. Brett's common highly preferred items included superhero figurines and stuffed animals and Tina's common highly preferred items were bubbles and a photo book. In this phase a differential reinforcement procedure was used, as described above. However, in this condition independent correct responses resulted in praise plus the additional item, responses following a partial-word verbal prompt resulted in praise alone, and responses following the full-word verbal prompt resulted in no programmed consequence and the introduction of the next trial.

Errorless prompting with praise plus highly preferred items (Brett and Tina). In the event that a participant met the failure criterion for a target set beyond the introduction of the highly preferred item, an additional phase was implemented that consisted of using a most-to-least prompting procedure. During this phase a brief 1-array MSWO was implemented at the beginning of the visit and highly preferred items were paired with the praise statements as described above. Additionally, each session began with an errorless training session in which the S^D was presented (e.g., "What animal says 'Moo'?") immediately followed by the experimenter giving the full-word prompt of the correct answer (e.g., "Cow"). After the full word prompt was given, the participant said the answer back to the experimenter. If he or she did not, the experimenter waited 5 s, said nothing, and introduced the next target. If the participant responded incorrectly to the full-word prompt (e.g., said "Pig" when given the prompt "Cow") the experimenter provided one additional full word prompt (e.g., "Cow") and the participant said the correct word back to the experimenter. If he or she did not respond or responded incorrectly, the experimenter waited 5 s, said nothing, and introduced the next target. It should be noted that participants never responded incorrectly to the full-word prompt. This continued with all 9 trials

in the set. After the errorless training session, the experimenter provided a probe of each target in the set using the least-to-most prompting procedure described above, except in this phase the experimenter provided the S^D and followed through with the least-to-most prompting strategy for each target only once (as opposed to 3 times each as in previous phases). For these least-to-most probes (consisting of 3 trials), the same differential reinforcement procedure was used as discussed in the previous phase.

Prompting plus neutral statement (Brad only). In the event that there was no clear difference between descriptive or general praise (as evidenced in Brad's evaluation) an additional phase was implemented during which a neutral statement was paired with the prompting strategy. Sessions were conducted in the same manner as the prompting plus praise condition, except that the consequence delivered contingent upon correct responding was a neutral statement, such as "Let's move on" or "Let's try this." Additionally, the differential reinforcement component included the neutral statement for independent correct responses and correct responses after the partial word prompt was provided. For responses given after the full word prompt, nothing was said and instead the next trial was presented.

Follow-up assessment. Three to four weeks after each participant's completion of the study (by reaching mastery or the failure criterion) follow-up assessments were conducted. During follow-up, the experimenter conducted one session with the child similar to baseline condition, except that the session consisted of only one presentation of each target (3 trials). In each trial, the corresponding S^D was provided (e.g., an instruction such as "What animal says 'Moo'?") and data were collected on the child's response (either correct, incorrect, or no response; as defined above). The consequence provided by the experimenter for correct and incorrect responses was a neutral statement (e.g., "Let's move on" or "Time to try this"). If a

participant provided no response immediately after the S^D was presented, the experimenter waited 5 s before beginning the next trial.

Procedural Integrity

To assess procedural integrity, a second, trained observer collected data on the experimenter's behavior to determine whether the experimental procedures were implemented correctly. Specifically, procedural data were collected on the following: (a) type of praise given, (b) enthusiasm in teaching, and (c) correct implementation of teaching protocol. In assessing the correct implementation of the teaching protocol, the trained observer watched video-taped sessions and assessed whether the experimenter presented the S^D correctly throughout the session according to the target set being taught (e.g., household items, body part functions). The observer also assessed whether the experimenter provided the least-to-most prompting sequences correctly within 5 s of the participants' responses. The observer also assessed whether the correct consequences were provided (e.g., neutral statement in baseline, general praise in the general-praise condition). Additional detail on procedural integrity skills can be found on the a sample data sheet in Appendix G.

A procedural integrity score was calculated for 36%, 33%, 33%, and 33% of the treatment-evaluation sessions for Brad, Shaun, Tina, and Brett respectively. The procedural integrity score was calculated as the percentage of correct responses made by the experimenter during a session (out of a total of 46 possible responses). The mean and range of integrity scores in each participant's evaluation were as follows: Brad 99% (range, 95-100%), Shaun 100%, Tina 99% (range, 97-100%), and Brett 100%.

In addition, IOA was assessed for 100%, 100%, 38%, and 50% of the integrity data collection sessions for Brad, Shaun, Tina, and Brett, respectively. During IOA checks, a trained

observer collected procedural integrity data and compared those data to the integrity data collected by the second, trained observer. Data were compared using the point-by-point agreement formula. An agreement was defined as the two independent observers agreeing on whether the experimenter's response during an aspect of the trial (e.g., presentation of instruction, consequence delivery, etc.) was correct or incorrect. The mean and range of IOA scores for procedural integrity measures for each participant were as follows: Brad 98% (range, 89-100%), Shaun 100%, Brett 100%, and Tina 100%.

CHAPTER III

Results

Reinforcer (Praise) Assessment

Results of the pre-experimental praise assessments for all participants are depicted in Figure 1. Across participants there was no clear differentiation of effects of the descriptive praise (DP), general praise (GP), or no praise (control) conditions on responding. Brad's average break point were 5.3 (range, 5-6) when descriptive praise was provided, 4 responses (range, 1-6) when general praise was provided, and 4.6 responses (range, 3-6) when no praise was provided for placing stickers on a piece of paper. Shaun engaged in higher rates of responding, but also showed no differentiated responding across conditions. His average break points were 9.3 (range, 7-12) when descriptive praise was provided, 10 (range, 9-12) when general praise was provided, and 10 responses (range, 8-12) when no praise was provided for putting blocks in a box. Similarly, Tina emitted stable, undifferentiated responding in the assessment. Her average break points were 9 (range, 8-10) when descriptive praise was provided, 9.5 (range, 9-10) when general praise was provided, and 9 (range, 8-10) when no praise was provided for sticker placement. Finally, Brett emitted similar patterns of responding with average break points of 8 (range 8-8) when descriptive praise was provided, 8.5 (range, 8-9) when general praise was provided, and 8.6 (range, 8-10) when no praise was provided for sticker placement. Thus, from these assessments it appears that general and descriptive praise were equally ineffective in elevating response rates above those obtain in the absence of programmed reinforcement.

Treatment Evaluation

Brad. The percentage of correct intraverbals emitted by Brad during the treatment evaluation is shown in Figure 2. During baseline, Brad emitted none of the answers to the targeted intraverbal "What" questions correctly. Upon implementation of the prompting-plus-praise condition, both the descriptive and general praise conditions produced acquisition to mastery of the body-part and household-item intraverbal sets (i.e., sets 1-4; top 2 panels). Moreover, Brad's responding was comparable under the descriptive and general praise conditions, showing no clear differentiation between the two types of praise on the rate of acquisition, which was similar to the results of Brad's praise assessment. Additionally, the number of sessions required for him to master sets 1-4 was similar across descriptive and general praise conditions. For the comparison of set 1 versus set 2 (top panel; body part functions) he mastered set 1 in 10 sessions with general praise and set 2 in 8 sessions with descriptive praise. This finding was replicated in the middle panel (household items) with mastery obtained within 8 sessions with general praise (set 3) and 6 sessions with descriptive praise (set 4). Follow-up data showed that his mastery of skills in sets 1, 2, and 3 maintained at 100% correct, while performance on set 4 decreased to 66% under descriptive praise. Although he was able to master skills slightly more quickly with descriptive praise (M=7 sessions; range, 6-8) than general praise (M=9 sessions, range, 8-10), the difference between the effects of each type of praise was minimal and this finding was replicated across both evaluations.

The bottom panel of Figure 1 shows Brad's acquisition of the skills in sets 5 and 6 under the prompting-plus-neutral-statement intervention, which produced acquisition to mastery criteria for both sets, with maintenance at 100% for both sets during the follow-up evaluation. Brad mastered set 5 in 14 sessions and set 6 in 23 sessions, which differed greatly from his

performance in the praise interventions when it took an average of 8 sessions for his responding to reach mastery (range, 6-10). Thus, in comparison to his performance when praise was provided for correct responding, his rate of skill acquisition was much slower. This finding also shows the utility of prompting for skill acquisition, as Brad was able to learn the skills with prompting and differential neutral consequences, but it appears that praise may be important for increasing instructional efficiency.

Shaun. The percentage of correct intraverbals emitted by Shaun during the treatment evaluation is shown in Figure 3. During baseline, Shaun never responded correctly to the "What" questions presented. Upon implementation of the prompting-plus-praise condition, both descriptive and general praise led to mastery for all target sets. In the first comparison (top panel), Shaun emitted similar patterns of responding across descriptive and general praise conditions. His responding in both sets reached mastery in the same number of sessions (17), however only descriptive praise resulted in strong maintenance of skills at follow up (100% correct for set 2 [descriptive] versus 33% for set 1 [general]). In the second comparison (middle panel), Shaun's rate of acquisition was faster with descriptive than general praise, and he reached mastery of set 4 (descriptive praise) within 12 sessions, more quickly than his mastery of set 3 in general praise (20 sessions). Both interventions resulted in high performance at follow up (88% and 100% correct for sets 3 and 4, respectively).

In the third comparison (bottom panel), Shaun's performance was comparable across praise conditions. His responding reached mastery criteria in 13 sessions with descriptive praise (set 6) and 16 sessions with general praise (set 5), and his performance at follow up was maintained at mastery level (88%) for both conditions. Although Shaun was able to learn all targeted skill sets to mastery, the effects of the type of praise on his acquisition performance

were varied. The first comparison showed equal effects (as was also shown in his praise assessment); however, the second comparison showed an advantage of descriptive over general praise (a 12-session difference). Finally, the third comparison showed only a slight (3 session) advantage of descriptive praise.

Tina. Data from Tina's treatment evaluation are depicted in Figure 4. During baseline, Tina emitted zero intraverbal fill-in phrases correctly. In the first comparison (top panel; household items) Tina's responding showed very slow and variable acquisition upon implementation of the prompting-plus-praise interventions. Although the descriptive praise intervention initially produced higher acquisition than general praise (until session 33), her responding eventually met failure criteria in both praise conditions after equal exposure to the same number of sessions (21 sessions to failure). After contingent highly preferred items were added to the treatment package, Tina's responding immediately met mastery criteria within 3 sessions under the descriptive praise condition (set 2), while she emitted slow but steady acquisition in the general praise condition (set 1) which eventually reached the failure criterion (after 17 sessions). After implementation of the final phase in which errorless training was added to the treatment package, Tina quickly mastered the set after additional 6 sessions. Thus, in this comparison, it appeared that neither type of praise was effective alone as a reinforcer and required the addition of a highly preferred item to facilitate skill acquisition. For set 1, changing the type of prompting procedure eventually resulted in final mastery. At follow up, both skill sets maintained at 66% correct.

In the second comparison (middle panel; body part functions), Tina's responding under both descriptive and general praise interventions showed very similar patterns, often overlapping. Although general praise appeared to produce a similar rate of acquisition, Tina

mastered set 3 (general praise; 17 sessions) more quickly than set 4 (descriptive praise; 23 sessions). At follow up, her responding remained at mastery (100%) for the general praise set and dropped to 33% for the descriptive praise set. Finally the third panel served as a control condition (baseline only) which showed no skill acquisition without any teaching intervention in place.

Tina's treatment evaluation results showed inconsistencies regarding the effects of praise. In the first comparison, it appeared that descriptive praise produced faster mastery (with additional tangible reinforcement), but in the second comparison general praise produced slightly faster mastery. Thus, there did not appear to be clear and consistent beneficial effects of one type of praise over the other.

Brett. Brett's treatment evaluation data are presented in Figure 5. During baseline, Brett emitted none of the intraverbal math addition fill-in phrases correctly, with the exception of session 97 in panel 3, when he answered one phrase correctly (responded "23" to the phrase "20+3 __"). In the first comparison (top panel; "ones"), prompting and praise failed to produce responding much higher than baseline (22% correct for general praise and 11% correct for descriptive praise). After the addition of contingent high-preference items, Brett's responding showed very slow acquisition with no differential effects between praise conditions. Both praise interventions produced similar trends of responding (often overlapping), eventually meeting the failure criterion after 24 sessions in each praise condition. The third and final phase included an additional errorless training component. This change produced additional acquisition, but the mastery criterion was not met, even when the target behavior was modified to reduce the likelihood of erroneous stimulus control. Additionally, there was no difference in the effects of descriptive and general praise. Brett's responding eventually met the failure criterion after 21

sessions in each of the praise interventions and his percentage correct scores did not exceed 66% in either condition. After this final phase, sessions were discontinued per final failure criteria (mentioned previously).

Brett's second praise comparison (middle panel; "tens") produced similar findings. Making use of the findings from Brett's first evaluation, the initial treatment package in the second evaluation included errorless training and contingent high-preference items, in addition to praise. Although there was some increase in responding, the failure criterion was eventually met, with percentage correct scores never exceeding 66%. Overall, Brett's treatment evaluation showed that there was no difference in the effects of descriptive versus general praise on the acquisition of intraverbal fill-in phrases, a finding consistent with that of the other participants. However, with Brett there was no differential effect between praise conditions even when skills were not mastered.

Summary. Figure 6 depicts a summary of all treatment-evaluation findings. The number of sessions to meet the mastery criterion is displayed in the top panel. Although the effects of the specific type of praise on skill acquisition appear to be idiosyncratic, there were minimal, if any, advantages of descriptive praise in acquisition efficiency. In 5 out of 9 comparisons (55%), participants reached mastery faster with descriptive praise; however, the differences were often minor. In 3 out of 9 comparisons (33%), participants met mastery (or failure for Brett) in the exact same number of sessions. Only 1 of the 9 comparisons (11%) resulted in faster skill acquisition with general praise (Tina), and again, the difference was small.

The bottom panel of Figure 6 depicts percentage correct scores during follow-up evaluations. Just as it appeared that there was little difference between the effects of descriptive and general praise in terms of acquisition efficiency, the follow-up data also showed no clear

difference between the effects of descriptive or general praise on skill maintenance. Of the 7 comparisons that resulted in mastery (Brett not included), the majority (43%) of comparisons resulted in no difference in follow-up performance. Of the remaining comparisons, 2 out of 7 (28.5%) resulted in higher performance at follow-up with descriptive praise and the other 2 out of 7 (28.5%) resulted in greater maintenance of skills at follow-up with general praise. These data support the conclusion that there was no reliable benefit of one type of praise over the other in terms of skill maintenance.

CHAPTER IV

Discussion

The results of the present study contribute to the contemporary line of research on the use of descriptive praise when teaching skills to young children with ASDs. The use of descriptive praise resulted in no reliable benefit over general praise (both within and across participants) and when differences were detected they were minimal. More specifically, skills taught with descriptive praise were not acquired more quickly nor did they maintain better at follow-up compared to skills taught with general praise. Additionally, there were no clear added benefits of descriptive praise when comparisons examined praise alone or when praise was combined with highly preferred items. These findings appear to have been predicted by the results of the reinforcer (praise) assessments that showed no differential effect of the type of praise on responding.

The findings of the present study are consistent with recent empirical reports. For example, Stevens et al. (2010) evaluated the effects of descriptive and general praise in combination with contingent token delivery on the acquisition of tacts of two children ASDs and found no between-condition differences. Similarly, Sellers and Higbee (2009) found no difference in the rate of skill acquisition of receptive actions (i.e., auditory discriminations) across descriptive and general praise conditions with three children with ASDs. Of the 3 children, 2 exhibited very little learning with either type of praise (as was also seen with Brett in the current study). Additionally, in the Sellers and Higbee investigation, the children did not exhibit faster acquisition when praise was used alone

or when praise was paired with an edible item, providing further evidence (along with Stevens et al. and the present investigation) that pairing praise with additional reinforcers may not increase the effectiveness of the type of praise used. Finally, the current study investigated praise with more skilled learners (i.e., with strong listener repertoires) than those in the Stephens et al. and Sellers and Higbee studies, and still no differential benefit of descriptive praise was found. Thus, the utility of descriptive praise may not be specifically related to receptive language skills, at least for those children on the autism spectrum.

From the present findings, it appears that the numerous recommendations favoring descriptive over general praise commonly found within the scientific (e.g., Brophy, 1981) and practice literatures (e.g., Leaf & McEachin, 1999; Maurice, Green, & Luce, 1996) have not yet been supported. It is possible, however, that praise might be an integral educational component as all children in the current study learned to some extent with the implementation of the prompting-plus-praise. On the other hand, praise appeared to have idiosyncratic effects on skill acquisition. Two of the 4 participants required the addition of highly preferred items with praise to increase acquisition. Moreover, one participant (Brad) was able to acquire skills without praise (a neutral statement alone was sufficient).

Since it does appear that the utility of praise (descriptive or general) could be highly individualized, investigating predictors of such outcomes would be useful to increase the efficiency of skill acquisition program development and implementation. In the current study, we conducted reinforcer (praise) assessments prior to intervention to determine if they would predict the results of the praise evaluations. The results of these assessments showed no differentiation of responding in either descriptive or general praise conditions, suggesting that the assessments did serve as a predictor for the utility of the type of praise (that there would not be a difference).

However, it is possible that the participants' undifferentiated responding was a result of compliance to the initial instruction to "Do this" from their instructional history. In addition, it is also possible that the tasks that were chosen for the assessments were automatically reinforcing. This does not appear to be a strong possibility, because different tasks were probed prior to the assessments and neutral materials were used (e.g., beige blocks, white stickers). Thus, to the extent that responding in the reinforcer assessment was influenced by instructional control or the automatically reinforcing properties of the preparation, the results of the assessments would not be predictive of subsequent learning in the treatment evaluations.

Another interesting finding from this study was Brad's skill acquisition when only a neutral statement (e.g., "let's move on") was provided as a consequence for responding, suggesting that learning can be produced by simply pairing prompting with differential consequences. This particular evaluation is further evidence that young children with ASDs can learn without the explicit use of praise; however, it may take longer to acquire skills under such conditions (as was found with Brad). This finding is particularly interesting because research has suggested that the use of praise by teachers can be infrequent in general education classrooms (ranging 0.02 to 4.4 per hour, Brophy, 1981; Shores, Gunter, Ellis, DeBriere, & Wehby, 1993; Wehby, Symons, & Shores, 1995). The paucity of praise has lead to efforts to increase teachers' use of praise (e.g., Alber et al., 1999; Craft et al., 1998). Given the relative lack of praise that is possible in general education classrooms, the finding that a child diagnosed with autism (Brad) was able to acquire skills without praise suggests that he may have been responding more like a "typical" child, since typical children can still succeed in general education classrooms regardless of the density of praise (as evidenced by skill acquisition of children in general

education classrooms that include little praise). Moreover, it is possible that this finding is a direct benefit of Brad's 2 years experience with EIBI prior to the study.

Further research is needed to evaluate the necessity of praise in teaching children with ASDs. Perhaps very early learners require dense praise which can be thinned out over time. However, research suggests that praise can be difficult to establish as a conditioned reinforcer. Dozier (2006) evaluated strategies for establishing praise as a reinforcer for adults with developmental disabilities (e.g., intellectual disabilities) whose behavior was not initially sensitive to praise as a reinforcer (a common finding also in children with ASDs; Lovaas, 2003). Three different approaches to conditioning praise were evaluated (all of which paired previously neutral statements with preferred edibles) and the results of the experiments showed that the effects of praise as a conditioned reinforcer were inconsistent and idiosyncratic at best. Thus, praise alone may not be an effective reinforcer for individuals with developmental disabilities, even after multiple pairings with known reinforcers. Additionally, there may be other stimulus factors critical to the efficacy of praise as a reinforcer, such as facial expressions, tone of voice, enthusiasm, etc. Further research could isolate the particular stimulus components of praise to determine if the verbal statement is integral or if a large smile, widened eyes, or excited tone of voice are more relevant for establishing praise as a reinforcer.

Given the ubiquitous recommendations for descriptive praise in EIBI (e.g., Anderson et al., 1996; Leaf & McEachin, 1999), the question remains whether the recommendations should be tempered or discontinued in light of the emerging empirical evidence on the topic. Additionally, it may be more beneficial to focus on what current evidence suggests as the most effective for increasing responding in skill acquisition programming versus focusing efforts on the use of praise. Until further support is provided for the use of praise, practitioners may

consider pairing either type of praise (general or descriptive) with highly preferred items contingent upon correct responding in teaching language skills to children with ASDs. There is a large body of literature on the use of stimulus preference assessment technology to identify preferred items that consequently serve as reinforcers (e.g., Carr et al., 2000; Fisher et al., 1992). Thus, while there is lacking support for one type of praise over the other, practitioners should still see benefits in skill acquisition by focusing their clinical efforts on pairing praise with known preferred items when teaching language and language-related skills. Of course, the recommendation to use praise in conjunction with highly preferred tangible items begs the question, "Is praise necessary?"

In the current investigation, it is possible that descriptive praise could have produced additional benefits over general praise, but that the effects were simply undetected. The current study taught individual responses (i.e., intraverbals) in a direct instructional context where correct answers were prompted. It is possible that descriptive praise may be particularly beneficial when teaching skills in indirect teaching formats, such as teaching multiple responses in a more complicated and social context. For example, descriptive praise may have an advantage over general praise when teaching a social skill such as appropriate peer play. In such training, a practitioner could contrive a teaching scenario with a peer and observe the child, then contingent upon correct peer play provide descriptive praise immediately. In such a situation the correct response may not be salient to the child, as the appropriate skill is part of a more complex social environment. It is possible that the added verbal feedback in descriptive praise may serve additional benefits to the learner by allowing them to tact the correct response they had engaged (as per the praise provided). Future research could evaluate the use of descriptive versus general praise in teaching social skills.

Another potential benefit of descriptive praise might be in the area of emergent behavior. For example, it may be possible that teaching a skill such as motor imitation with descriptive praise could result in the emergence of a corresponding tact. To teach a motor imitative skill, the practitioner would provide the instruction "Do this" and then model the correct response, such as touching her nose. Upon correct imitation, if the clinician uses descriptive praise, she would say "Great job touching your nose!" Upon acquisition of this skill with descriptive praise, it is theoretically possible that the child might also acquire the tact for the item or body part involved in the motor imitation skill. This could feasibly occur if the child echoed (overtly or covertly) the therapist's praise statement ("nose") while looking at her nose. Similar emergent relations might be evaluated with other programs that include a nonverbal stimulus and the therapist's tact of the stimulus during descriptive praise (e.g., matching, receptive identification). Future research on such emergent relations would be necessary to justify the use of descriptive praise for such purposes.

It is also important to consider other environmental conditions under which descriptive praise could potentially be more useful. Although direct evaluations of descriptive versus general praise are few, studies have showed some utility of using descriptive praise in a number of educational contexts (Chalk & Bizo, 2004; Novak & Hammond, 2001; Sutherland et al., 2001), mostly with typically developing children (with and without emotional or behavioral disorders). It is possible that a stronger verbal repertoire is necessary to reap the benefits of descriptive praise, and it may be that individuals must be able to verbalize rules either privately or publicly in order to gain benefits from descriptive praise. For example, telling a child "Thank you for putting your toys away" may not be a meaningful statement to a very young learner with ASD, but with a greater history of reinforcement for rule following, a child with stronger verbal

abilities may acquire a rule "If I put my toys away I will get attention." While the child's "putting toys away" behavior may or may not be continuously reinforced by the mother, the verbal rule statement could eventually be paired with public reinforcement to exert stimulus control over the behavior in question (putting toys away). If a child does not have the ability to make such rules, the descriptive nature of praise may not serve as a meaningful stimulus.

The results of the present study should be evaluated in the context of several limitations. First, the results of the reinforcer (praise) assessments for all participants produced no change in responding across descriptive, general, and no-praise conditions. It is possible that the tasks used in the study were inherently reinforcing despite efforts to select activities that were neutral to the children (i.e., through the use of plain beige-colored blocks and white circle stickers). Another explanation for this finding is that the initial prompt and model provided at the beginning of the session (i.e., saying "Do this" and modeling the response) exerted stimulus control over consistent responding. Thus, perhaps the participants' responding was under the control of the antecedent as opposed to the scheduled consequences. These possibilities do not appear to undermine the results of the study, although they do question the utility of the praise evaluation's contribution to the final project. Future research could further investigate the utility of praise assessments as predictors of success in praise-based interventions.

Second, it is possible that the skills targeted for the study were not as equated for difficulty as initially predicted. While each skill set included single-syllable words, in the third comparison conducted with Brad (prompting plus neutral statement) he mastered set 5 more quickly than set 6 (in 14 versus 23 sessions). In this comparison, there were not two separate interventions being compared, and instead the same intervention was implemented across sets. If the two were equally difficult he should have mastered them in the same number of sessions. In

the 3-word set 6, he emitted more incorrect answers to the question "What animal purrs (cat)?" compared to "What animal swims (fish)?" and "What animal has a curly tail (pig)?" Instead of answering "Cat," he would answer "Cat-ten" (possibly a combination of *cat* and *kitten*) and then answer "Cat" during the error-correction procedure. Although the data suggest that it was possible that the sets were not equated for difficulty, this is likely not an issue regarding the other sets because the other participants' trends of skill acquisition were often very similar (or identical). Additionally, when Brad would incorrectly answer "Cat-ten" he often did so while giggling, which suggests additional sources of reinforcement for the response.

Third, Tina's variability in responding in both comparisons could have been due to problems in articulation of the words in the sets. She would sometimes engage in response chains by repeating back the entire intraverbal phrase, resulting in variable incorrect responding. Thus, it is possible that some words were more difficult phonetically. For example, it took her longer to master set 1, during which she provided incorrect answers for only the phrase "You cook soup in a___ (pot)". She would commonly answer "Po" and not the full phrase "Pot" suggesting the "-t" sound may have been more difficult to produce. However the most-to-least prompting strategy eradicated the acquisition problem and comparisons were still able to be made across the types of praise (although in the context of additional intervention components).

A fourth limitation to the study was the final failure to teach math intraverbals to Brett. It may have been that the skill was too difficult and that pre-requisite mathematic skills (addition) were necessary to be able to complete the intraverbal phrases. For example, a child may need to master addition through other methods prior to teaching the phrase "1+1= __" (e.g., show one penny, then show another penny, and put them together and ask the child to count how many there are in total). However, it could also be possible that when teaching math skills, pairing

picture prompts (e.g., showing a flashcard with the numbers 2+3=___) with the introduction of the intraverbal phrases may be facilitative. Although he did not acquire the skills in the study, his performance is particularly interesting because it further demonstrated the nondifferential effects of descriptive praise on performance.

In the current investigation it appears that recommendations for using descriptive praise in teaching language to children with ASDs exceed the evidence to support them. In the 9 comparisons conducted in this study, descriptive praise did not produce any reliable beneficial effects across and within participants. Thus, it cannot be confidently concluded that descriptive praise provides a greater benefit than general praise for skill acquisition in children with ASDs, but rather the effectiveness of descriptive praise (and praise, in general) as a teaching strategy seems to be idiosyncratic. The present study suggests the need to proceed with caution when considering behavioral strategies in EIBI, even if the strategy is commonly recommended. Furthermore, practitioners should seek evidence in support of EIBI practices they are using or considering. This is imperative in the field of ABA where behavior analysts are ethically bound to provide effective, evidence-based behavioral services and to make data-based decisions (Behavior Analyst Certification Board, 2010).

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Footnote

[1] From this point forward, the term *descriptive praise* will encompass other references to the same strategy, such as behavior-specific praise, approval with description, behavior-descriptive praise, and process praise.

Table 1

Intraverbal Skill Targets used for Instruction

	Participants			
	Brad	Shaun	Tina	Brett
Intraverbal Skill Area	Answering "What?" questions	Answering "What?" questions	Answering "Fill-in" phrases	Answering "Fill-in" phrases
Set 1	What do you: Eat with? Chew with? Kick with?	What animal: Barks? Has feathers? Has whiskers?	You cook soup in a _ You sleep in a _ You drink out of a _	2+ 1 equals _ 3+ 2 equals _ 4+5 equals _
Set 2	What do you: Clap with? Blink with? Taste with?	What animal: Is pink? Do you get milk from? Eats hay?	You cut food with a _ You take a bath in a _ You sit on a _	3+1 equals _ 4+2 equals _ 5+3 equals _
Set 3	What do you: Cook soup in? Take a bath in? Sweep the floor with?	What do you: See with? Taste with? Walk with?	You see with your _ You smell with your _ You clap with your _	9+4 equals _ 7+8 equals_ 10+9 equals_
Set 4	What do you: Eat ice cream with? Cut food with? Eat food off of?	What do you: Eat with? Smile with? Chew with?	You kick with your _ You eat with your _ You hear with your _	6+8 equals _ 10+6 equals _ 9+9 equals _
Set 5	What animal: Has feathers? Do you get milk from? Barks?	What do you: Sweep the floor with? Eat food off of? Take a bath in?	Animal that barks is a _ Animal that has a curly tail is a _ Animal that swims is a _	19+2 equals _ 18+5 equals _ 17+8 equals_
Set 6	What animal: Swims? Purrs? Has a curly tail?	What do you: Cook soup in? Cut food with? Eat ice cream with?	Animal that has feathers is a _ Animal that purrs is a _ Animal you get milk from is a _	20+2 equals_ 21+3 equals _ 22+4 equals_

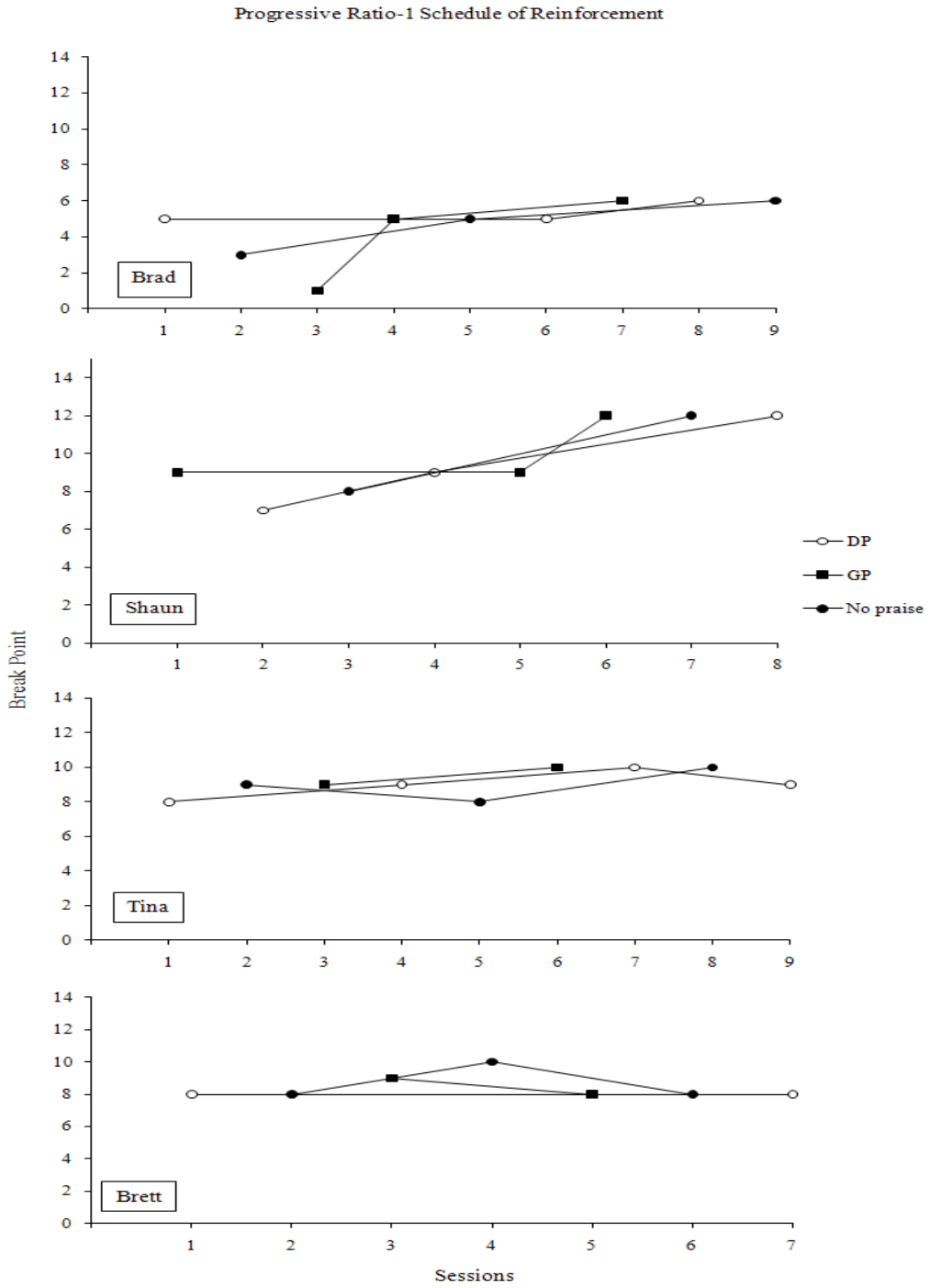

Figure 1. Reinforcer (praise) assessment results for Brad, Shaun, Tina, and Brett. *Note*: DP = descriptive praise, GP= general praise.

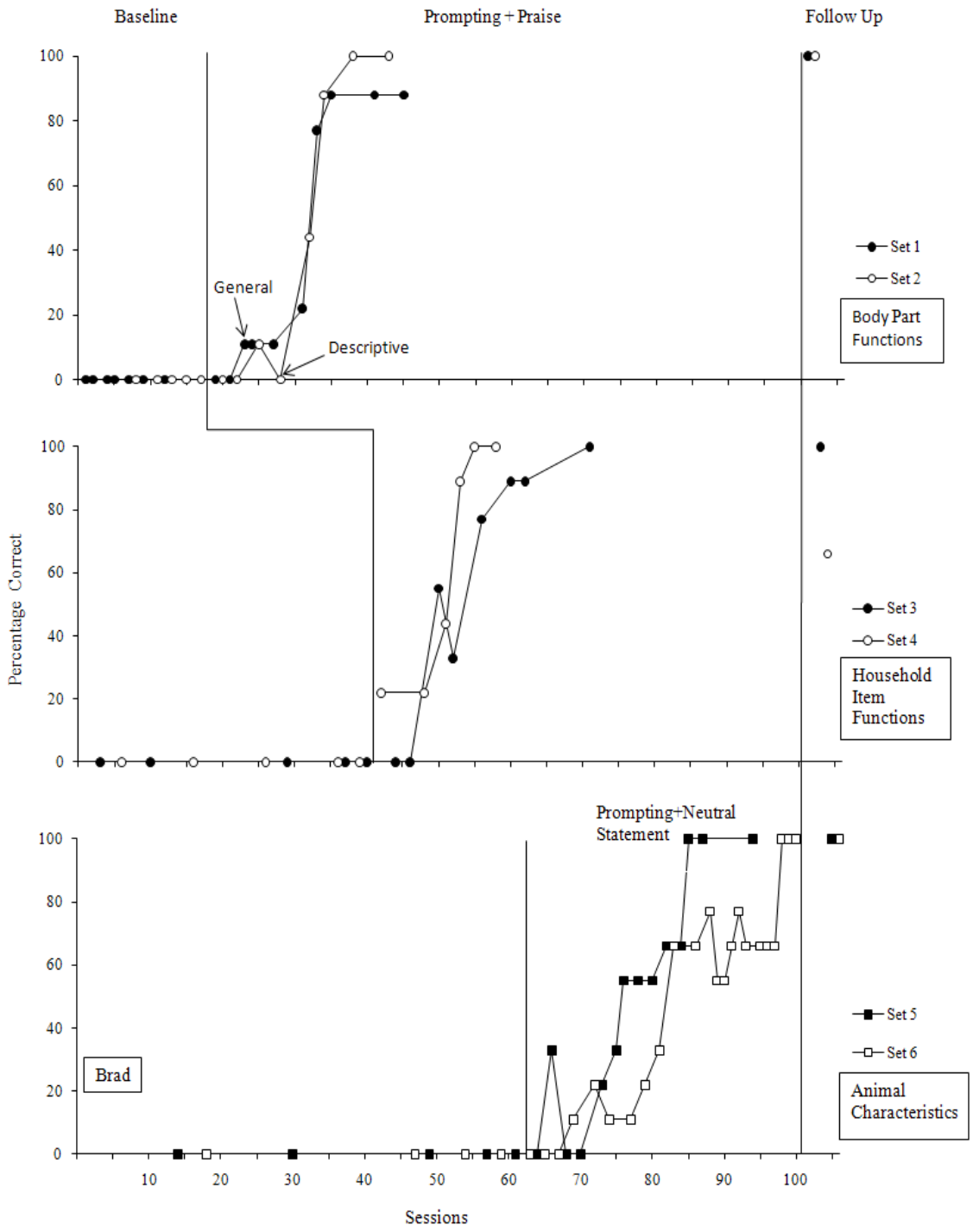

Figure 2. Percentage correct during baseline, treatment, and follow-up conditions for Brad.

Note: during the Prompting+Neutral Statement phase no praise was given.

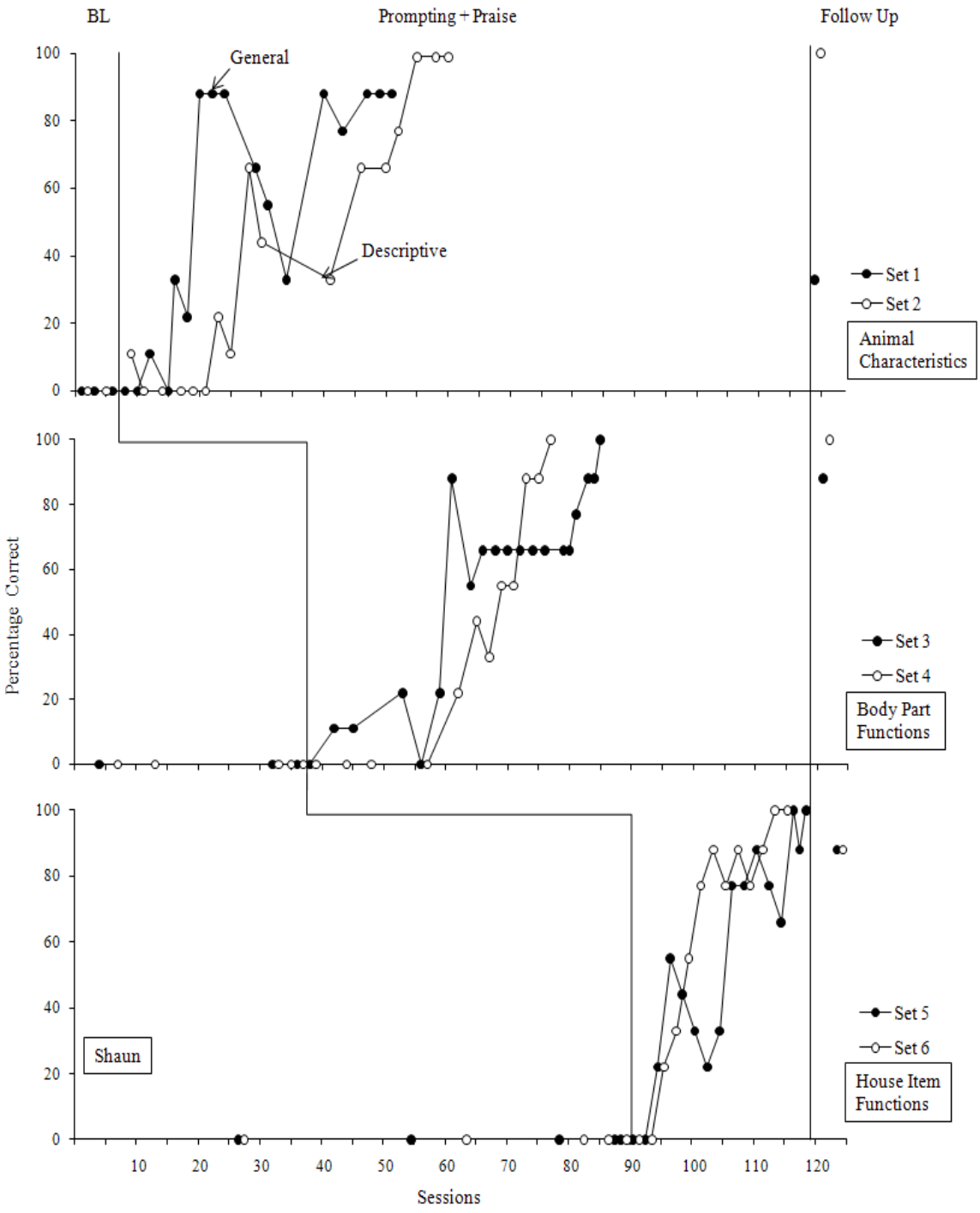

Figure 3. Percentage correct during baseline, treatment, and follow-up conditions for Shaun.

Note: BL = baseline.

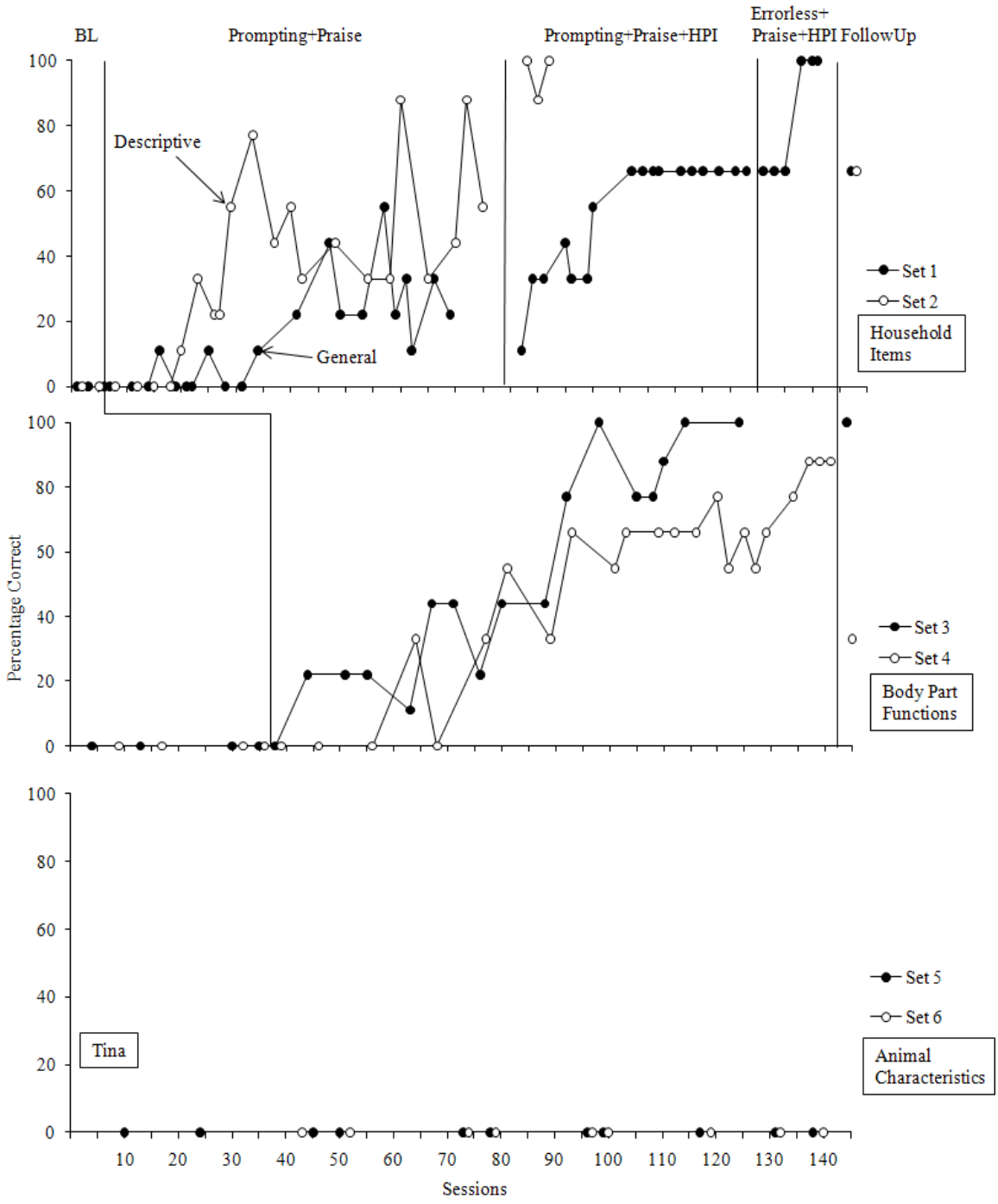

Figure 4. Percentage correct during baseline, treatment, and follow-up conditions for Tina.

Note: Errorless = errorless training, HPI = highly preferred item.

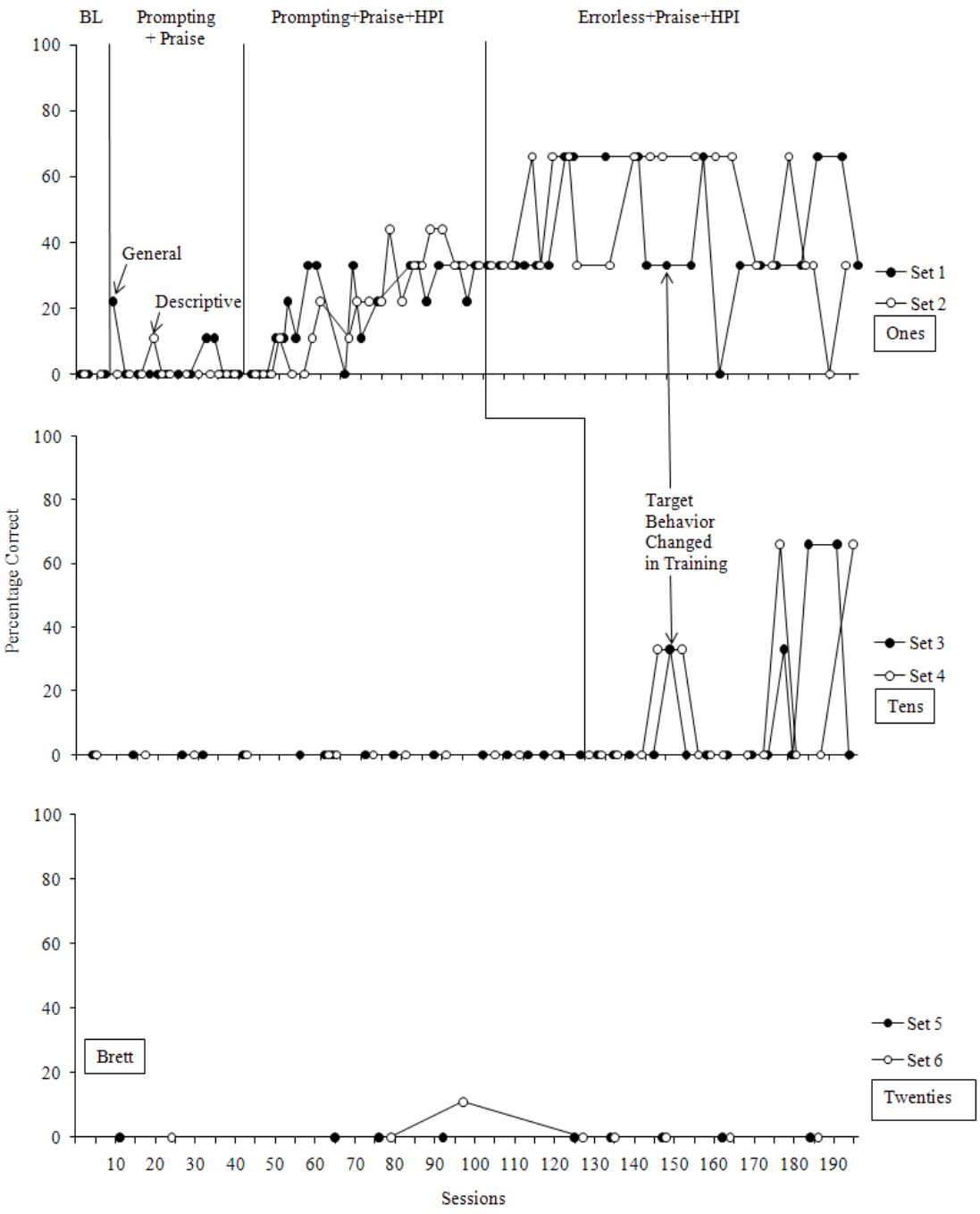

Figure 5. Percentage correct during baseline and treatment conditions for Brett. *Note:* At session 149 the target behavior in errorless training trials changed from a single word (e.g., "Nine") to the full phrase (i.e., "Four plus five equals nine."); Errorless = errorless training, HPI = highly preferred item.

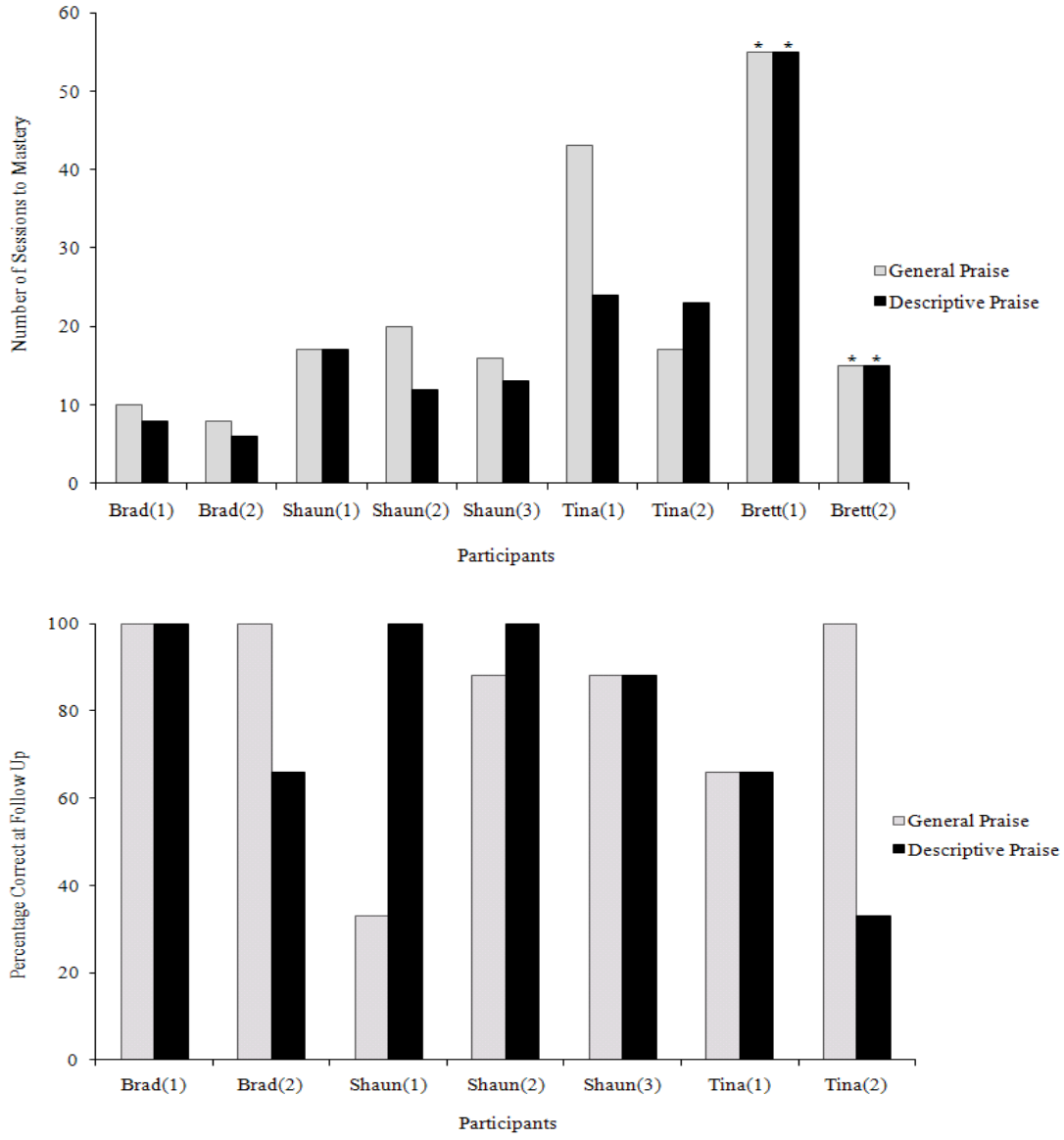

Figure 6. Number of sessions to meet mastery criteria during interventions consisting of either descriptive or general praise (top panel). Percentage correct during follow up data collection (bottom panel). *Brett did not meet mastery criteria and instead his data show the total number of sessions to meet final failure criteria.

Appendix A

Sample Experimental Visit Data Collection Sheet

Participant: _______________ Date:__________ Visit Time Start: _____ End:_____
Directions: For each trial circle if the child made a correct response (+), incorrect response (-), or no response (NR). Then circle 1 or 2 according to the prompt level given.

Session #		Session #		Session #	
Condition:		Condition:		Condition:	
Target Set: SET 1		Target Set: SET 2		Target Set: SET 1	
S^D:	**Response**	**S^D :**	**Response**	**S^D :**	**Response**
You cook soup in a _______(Pot)	+ − NR 1 2	You cut food with ___(Knife)	+ − NR 1 2	You sleep in a _______(bed)	+ − NR 1 2
You sleep in a _______(bed)	+ − NR 1 2	You take a bath in a ____(tub)	+ − NR 1 2	You drink out of a _______(cup)	+ − NR 1 2
You drink out of a _______(cup)	+ − NR 1 2	You sit on a _____(chair)	+ − NR 1 2	You cook soup in a _______(Pot)	+ − NR 1 2
You cook soup in a _______(Pot)	+ − NR 1 2	You cut food with ___(Knife)	+ − NR 1 2	You sleep in a _______(bed)	+ − NR 1 2
You sleep in a _______(bed)	+ − NR 1 2	You take a bath in a ____(tub)	+ − NR 1 2	You drink out of a _______(cup)	+ − NR 1 2
You drink out of a _______(cup)	+ − NR 1 2	You sit on a _____(chair)	+ − NR 1 2	You cook soup in a _______(Pot)	+ − NR 1 2
You cook soup in a _______(Pot)	+ − NR 1 2	You cut food with ___(Knife)	+ − NR 1 2	You sleep in a _______(bed)	+ − NR 1 2
You sleep in a _______(bed)	+ − NR 1 2	You take a bath in a ____(tub)	+ − NR 1 2	You drink out of a _______(cup)	+ − NR 1 2
You drink out of a _______(cup)	+ − NR 1 2	You sit on a _____(chair)	+ − NR 1 2	You cook soup in a _______(Pot)	+ − NR 1 2
% Correct **Session Duration:**		**% Correct** **Session Duration:**		**% Correct** **Session Duration:**	

Comments:

Appendix B

Sample IOA Data Sheet

IOA Data Collection Sheet

Directions: For each trial after the Sd was given (e.g., What do you eat with?) circle if the child made an independent correct response (+), incorrect response (made a sound that was not the full correct word) (-), or no response (said absolutely nothing when given the Sd) (NR). Also for each trial, circle the prompt that was given by Amy. Circle PP if she gave a partial word prompt (she restated the Sd and said part of the word) and circle FW if she restated the Sd and said the full word. Both PP and FW may be circled during a single trial, but only ONE of the +, -, or NR should be circled.

Participant:		**Participant:**		**Participant:**		**Participant:**	
Date of video:		**Date of video:**		**Date of video:**		**Date of video:**	
Session#: **Condition (circle):** **BSL DP GP NS**		**Session#:** **Condition (circle):** **BSL DP GP NS**		**Session#:** **Condition (circle):** **BSL DP GP NS**		**Session#:** **Condition (circle):** **BSL DP GP NS**	
Trial	**Response**	**Trial**	**Response**	**Trial**	**Response**	**Trial**	**Response**
1	+ − NR PP FW	1	+ − NR PP FW	1	+ − NR PP FW	1	+ − NR PP FW
2	+ − NR PP FW	2	+ − NR PP FW	2	+ − NR PP FW	2	+ − NR PP FW
3	+ − NR PP FW	3	+ − NR PP FW	3	+ − NR PP FW	3	+ − NR PP FW
4	+ − NR PP FW	4	+ − NR PP FW	4	+ − NR PP FW	4	+ − NR PP FW
5	+ − NR PP FW	5	+ − NR PP FW	5	+ − NR PP FW	5	+ − NR PP FW
6	+ − NR PP FW	6	+ − NR PP FW	6	+ − NR PP FW	6	+ − NR PP FW
7	+ − NR PP FW	7	+ − NR PP FW	7	+ − NR PP FW	7	+ − NR PP FW
8	+ − NR PP FW	8	+ − NR PP FW	8	+ − NR PP FW	8	+ − NR PP FW
9	+ − NR PP FW	9	+ − NR PP FW	9	+ − NR PP FW	9	+ − NR PP FW
% Correct		% Correct		% Correct		% Correct	

COMMENTS:

Appendix C

MSWO Data Sheet

Participant #**:** _____ Date**:** _____

Observer**:** _____

Directions:

1. Write the names of the 8 items from the RAISD in the gray boxes.
2. Arrange the items in a semi-circle so that all of the items are equi-distant.
3. Instruct child to "Pick one."
4. Block any attempts to select more than one item.
5. Once item selected, allow access for 30 s. Fill in the order that the items are selected (e.g., write a 1 in the box for the first item selected)
6. After the 30 seconds are up, remove the item.
7. Rearrange the array and repeat steps until all items have been selected or the child refuses to select an item.
8. Do three full MSWO arrays, then calculate preference percentage.

ITEMS								
1								
2								
3								
TOTAL								
Percentage								
Overall Rank								

Preference Percentage = (Number of times selected / Number in the "Total" box) X 100%

COMMENTS:

Appendix D

Sample Reinforcer (Praise) Assessment Data Sheet

Participant: _____ Date: _____

	Session#_____Condition _____				**Session# _____Condition _____**		
	Session Begin/End:				Session Begin/End:		
TIME	Response Tally	Crit	Crit Met?	TIME	Response Tally	Crit	Crit Met?
	Say " Do This" And Model Bx				Say " Do This" And Model Bx		
		FR-1	Y N			FR-1	Y N
		1	Y N			1	Y N
		2	Y N			2	Y N
		3	Y N			3	Y N
		4	Y N			4	Y N
		5	Y N			5	Y N
		6	Y N			6	Y N
		7	Y N			7	Y N
		8	Y N			8	Y N
		9	Y N			9	Y N
		10	Y N			10	Y N
		11	Y N			11	Y N
		12	Y N			12	Y N
		13	Y N			13	Y N
		14	Y N			14	Y N
		15	Y N			15	Y N
		16	Y N			16	Y N
		17	Y N			17	Y N
		18	Y N			18	Y N
		19	Y N			19	Y N
		20	Y N			20	Y N
	Break Point:				**Break Point:**		

*RUN UNTIL 5 MINUTES
* RUN UNTIL NO RESPONSE FOR 2 MINUTES
*# ATTEMPTS TO LEAVE_____ #ATTEMPTS TO LEAVE_____ #ATTEMPTS TO LEAVE_____
*ON 4TH ATTEMPT, END SESSION

Appendix E

Intraverbal Fill ins: TINA Date: _____

Directions: Play with Tina and while playing pause and state the following phrases. Record + if she gives correct answer, - if she says something else (and write what she answers) and NR if she doesn't answer.

- If she answers (+) on the first trial, no need to ask that phrase again.
- If she is incorrect or gives no answer, do not prompt the correct answer, give neutral statement

Household Items Functions:

Fill in phrase:	Trial 1	Trial 2	Trial 3	Comments
You clean the floor with a _____ (mop)	+ - NR	+ - NR	+ - NR	
You sleep in a _____ (bed)	+ - NR	+ - NR	+ - NR	
You drink out of a _____ (cup)	+ - NR	+ - NR	+ - NR	
You sit on a _____ (chair)	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
You cook soup in a _____ (pot)	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
You take a bath in a _____ (tub)	+ - NR	+ - NR	+ - NR	
You cut food with a _____ (knife)	+ - NR	+ - NR	+ - NR	
You eat ice cream with a_____ (spoon)	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
You eat food off of a _____ (plate)	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
	+ - NR	+ - NR	+ - NR	

Body part functions:

Fill in phrase:	Trial 1	Trial 2	Trial 3	Comments
You see with your _____	+ - NR	+ - NR	+ - NR	
You smell with your _____	+ - NR	+ - NR	+ - NR	
You hear with your _____	+ - NR	+ - NR	+ - NR	
You chew with your _____	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
You clap with your _____	+ - NR + - NR	+ - NR + - NR	+ - NR + - NR	
You taste with your _____	+ - NR	+ - NR	+ - NR	
You kick with your _____	+ - NR	+ - NR	+ - NR	

Appendix F

1-Array MSWO Data Sheet

Participant**:** _____ Date**:** _____

Observer**:** _____

Directions:

1. Write the names of the 8 potentially preferred items in the gray boxes
2. Arrange the items in a semi-circle so that all of the items are equi-distant.
3. Instruct child to "Pick one."
4. Block any attempts to select more than one item.
5. Once item selected, allow access for 30 s. Fill in the order that the items are selected (e.g., write a 1 in the box for the first item selected)
6. After the 30 seconds are up, remove the item.
7. Rearrange the array and repeat steps until all items have been selected or the child refuses to select an item.
8. List the top 3 items

ITEMS								
1								

Top 3 preferred items (LIST):

Appendix G

Sample Procedural Integrity Data Collection Sheet

Participant Name: _____
Date/Session #_____ Observer 1: _____
Experimenter: _____ Observer 2 (IOA): _____

Directions: For each videotaped session, please observe the experimenter and record "yes" or "no" for each trial that the experimenter runs. There should be nine trials per session.

Experimental Condition (circle)
(Consequences of condition)

Baseline (neutral statement) General Praise (GP) (general praise statement) Descriptive Praise (DP) (descriptive praise statement) GP+HP item (general + access) DP+ HP item (descriptive + access)

If Highly preferred condition, what was the highly preferred item?

Trial #	Provide correct S^D	Wait 5s before 1st prompt/ or give when incorrect	Wait 5s before 2nd prompt/ or give when incorrect	Provide correct consequence for response (see above)	Enthusiasm Rating (Please rate the experimenter's enthusiasm by circling 1, 2, 3, 4) 1= negative tone/mean 2= no enthusiasm/ neutral 3= enthusiastic/excited 4= overly enthusiastic	Comments
1	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
2	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
3	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
4	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
5	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
6	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
7	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
8	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	
9	Y N	Y N N/A	Y N N/A	Y N	1 2 3 4 N/A	

Were there 9 trials in this session? Y N
Other comments: /46 = _____TI%

IOA: _____ = IOA% _____
46

IOA= $\frac{\text{\# Agreements}}{\text{\# Agree + Disagree (46)}}$