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Assessing Preference for Home Language or English Praise in English Language Learners with Disabilities

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ASSESSING PREFERENCE FOR HOME LANGUAGE OR ENGLISH PRAISE IN ENGLISH LANGUAGE LEARNERS WITH DISABILITIES

by

Casey James Clay

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ABSTRACT

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Utah State University, 2015

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Assessing preference for stimuli has been shown to be of value when determining potential reinforcers for individuals with disabilities. Researchers have found that preference for forms of social interaction can be identified for persons with disabilities. Furthermore, these same social interactions can be used as reinforcers for these same persons. This study conceptualized different languages as different types of social interactions. Assessing preference for languages may be of use to identify forms of social reinforcement that can be used with English Language Learners (ELLs) with disabilities. Identifying reinforcers may be of value for this population to inform how to structure language supports in their environment. Five ELLs with disabilities between the ages of 10 and 17 years old participated in the study. We conducted a paired-stimulus preference assessment for specific language praise statements in English and Spanish to determine the language in which the participants preferred praise. Following the preference assessment, we conducted a concurrent-chains reinforcer assessment to determine reinforcing efficacy of praise in each language. We found two of five participants

preferred Spanish praise to English praise. Three of five participants' preference was undifferentiated between Spanish and English praise. For four of the five participants praise in different languages functioned as a reinforcer. All participants' preference assessments predicted, to a degree, the results of their reinforcer assessments. From these results we concluded our paired stimulus preference assessment was effective for evaluating preference for different types of praise. Preference was also indicative of reinforcing efficacy of praise.

(103 pages)

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Assessing preference for stimuli has been shown to be of value when determining potential rewards for individuals with disabilities. Researchers have found that preference for forms of social interaction can be identified for persons with disabilities. Furthermore, these same social interactions can be used as rewards for these same persons. This study conceptualized different languages as different types of social interactions. Assessing preference for languages may be of use to identify forms of social reinforcement that can be used with English Language Learners (ELLs) with disabilities. Identifying reinforcers may be of value for this population to inform how to structure language supports in their environment.

Five ELLs with disabilities between the ages of 10 and 17 years old participated in this study. We conducted a paired-stimulus preference assessment for specific praise statements in English and Spanish to determine the language in which the participants preferred praise. Following the preference assessment, we conducted a concurrent-chains reinforcer assessment to determine reinforcing efficacy of praise in each language. We found two of five participants preferred Spanish praise to English praise. Three of five participants' preference was undifferentiated between Spanish and English praise. For four of the five participants praise in different languages functioned as a reinforcer. All

participants' preference assessments predicted, to a degree, the results of their reinforcer assessments. From these results we concluded our paired stimulus preference assessment was effective for evaluating preference for different types of praise.

In sum, the results of this study indicate that preference for language of praise can be systematically identified. Furthermore, if preference for praise in a specific language is identified, use of praise in this language is more rewarding than in other languages. These findings should inform teachers on ways to improve effectiveness of praise, and simultaneously provide support in home language for students that prefer praise in this language.

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CHAPTER I

INTRODUCTION

English Language Learners

The prevalence of students who are English Language Learners (ELLs) in the United States is growing. ELLs are language minority students in the United States who are learning English, the majority language, for social integration and educational purposes (Paradis, Genesee, & Crago, 2011). The percentage of public school students in the United States who were ELLs increased from 8.7 percent, or an estimated 4.1 million students, to 9.1 percent, or an estimated 4.4 million students between the 2002-03 school year and the 2011–12 school year ("The Condition of Education 2014," 2014). An important and growing portion of ELLs are those with disabilities. There has been an increase in ELL children with disabilities from about 3.3% in 1987 to about 14% in 2001 (Zehler, Fleischman, Hopstock, Pendzick, & Stephenson, 2003). Many questions arise when determining effective teaching practices for ELLs with disabilities. For example, "What language should we use for students who are bilingual? That is, in what language do we teach in general, provide instruction, and use for praise? Answering these questions could lead to better outcomes for ELLs by introducing needed language supports, if necessary.

For many ELLs, both with and without disabilities, the primary language of instruction in school is English (Goldenberg, 2008; Mueller, Singer, & Grace, 2004) and often there is little to no instruction or support given in the home language (Goldenberg, 2008; Paradis et al., 2011). Additionally, many professionals and educators make

recommendations that parents speak to their children only in English rather than in their home language (Kremer-Sadlik, 2005; Wharton, Levine, Miller, Breslau, & Greenspan, 2000). Furthermore, a qualitative study by Yu (2013) revealed bilingual Chinese/English mothers of children with an Autism Spectrum Disorder (ASD) believed that using their home language with their children would hinder their overall English development. The rationale behind such beliefs and recommendations comes from the limited capacity hypothesis, which is the belief that individuals with disabilities may have a limited capacity to learn language, and that learning in the home language may hinder learning in English (Paradis et al., 2011). However, there is empirical evidence that does not support this hypothesis. For example, previous research demonstrates that bilingual children achieve milestones in the same time frame as their typically developing peers (Paradis et al., 2011). Additionally, bilingual children's rates of early vocabulary acquisition happen in the same range as age-matched mono-lingual children (Conboy & Thal, 2006; Pearson, Fernández, & Oller, 1993). Furthermore, studies done with bilingual children with disabilities, such as Down syndrome, found no evidence of a detrimental effect of bilingualism (Kay-Raining Bird et al., 2005). Also, a study done by Reetzke, Zou, Sheng, and Katsos (2015) found bilingual children diagnosed with an autism spectrum disorder did not demonstrate significantly different performance on standard measures (i.e., Children's Communication Checklist-2, Social Responsiveness Scale, and Language Environment Interview) relative to their monolingual peers. Therefore, there is much evidence that contradicts assumptions formed from the limited capacity hypothesis, and support in home language should be provided. In fact, subscribing to the limited capacity hypothesis can actually result in further delays in language acquisition for ELLs (Paradis

et al., 2011). Because positive interdependence between L1, or first language, and L2, or second language, has been found to produce advantages in academic ability (Genesee, 1987), setting up situations in which the child may lose L1 would be detrimental.

From a behavioral perspective it may be that opportunities for children to contact reinforcement when speaking in their home language are dramatically reduced when parents try to only speak English in the home. For example, a parent that has been told to only speak to their child in English may ignore or punish mands, or requests, in Spanish. Punishing mands may limit access to resources and ability to meet needs of the child, and, furthermore, decrease the use of Spanish by the child. They also may have fewer interactions throughout the day in which their parents are reinforcing them for using Spanish, leading to limited Spanish development.

When the use of Spanish is decreased, behavioral cusps that are independent of language development may also be missed. Rosales-Ruiz and Baer (1997) defined a behavioral cusp as, "a behavior that has consequences beyond the change itself, some of which may be considered important…it exposes the individual's repertoire to new environments, especially new reinforcers and punishers…." For example, learning how to imitate is a behavioral cusp that may be delayed if a parent stops providing social reinforcement (e.g., praise in Spanish) for attempts at imitation. In essence it is the environment (i.e., the actions of the parents) that is limiting the development (e.g., imitation) of the child and not an internal capacity as would be suggested by the limited capacity hypothesis.

Additionally, research suggests that support in both the home language and English results in better acquisition of both languages by the end of the elementary school

years (see August & Shanahan, 2006; Paradis et al., 2011 for a review of the literature in this area). There is also research suggesting that immersion programs do not reduce academic achievement for individuals with language disabilities. Bruck (1978, 1982) compared academic achievement levels for students with language disabilities in immersion (instruction in L2) and L1 only programs. They found similar levels of L1 ability and academic achievement for students in these programs. This evidence suggests that there may not be negative effects of schooling in both languages. Given these findings, the belief in a limited language capacity can be especially problematic for individuals with disabilities related to language, who by definition have deficits in communication and language acquisition. If parents of these children are told to only speak English (the second language) in the home, this may result in further deficits in language acquisition (Cheatham, Santos, & Kerkutluoglu, 2012).

Using both languages may produce the best language outcomes for children. However, language acquisition is only part of an ELL student's curriculum. Research has been done on the effects language of instruction has on academic achievement in a variety of school programs: English-only programs (Covey, 1973; Kaufman, 1968), bilingual programs (Huzar, 1973; Maldonado, 1994; Plante & Connecticut Staff Development Cooperative, 1976), heritage language programs (i.e., programs that focus on language of country of origin) (Morgan, 1971), and French Immersion Programs (Barik & Swain, 1978; Genesee & Jared, 2008). Francis, Lesaux, and August (2006) conducted a meta-analysis on this literature and concluded that there is no indication that bilingual instruction impeded academic achievement in either native language or English for language minority students, students receiving heritage language instruction, or

students enrolled in French immersion programs. If differences were observed, the review concluded that, on average, they favored the students in a bilingual program. Furthermore, the review concluded that bilingual instruction and bilingual influences in the home have been shown to produce more favorable outcomes for ELLs (Francis et al., 2006). Although there has been much research done reporting favorable outcomes of dual language instruction for ELLs, there remains a large gap in the literature on the effects of dual language instruction for ELLs with disabilities. Multiple authors have suggested few studies have examined the impact of dual language instruction for ELLs with disabilities on favorable outcomes, and more research in this area is warranted (Abedi, 2009; Gersten & Baker, 2000; Paneque & Barbetta, 2006).

Praise

Manipulating language of instruction may be one antecedent approach to setting up ELLs for success. Another integral part of effective instruction is what consequences are delivered following student behavior. The field of Behavior Analysis has examined in detail the effects of providing specific consequences to increase appropriate behavior in a variety of areas. More specifically, behavior analysts have, in multiple studies, documented the reinforcing effects of praise as a consequence (Brown, Willis, & Reid, 1981; DiCarlo & Reid, 2004; Hall, Lund, & Jackson, 1968; McLaughlin, 1982; Sigafoos, Doss, & Reichle, 1989). Praise has been delivered to a variety of populations to increase a variety of behavior such as academic work (Hall et al., 1968; McLaughlin, 1982), vocational skills (Dozier, Iwata, Thomason-Sassi, Worsdell, & Wilson, 2012), verbal

behavior (Polick, Carr, & Hanney, 2012; Sigafoos et al., 1989) , and leisure activity (DiCarlo & Reid, 2004).

Hall et al. (1968) increased rates of academic study behavior in six elementary-school aged students through contingent delivery of teacher praise. Following student study behavior, the teacher would approach the child and deliver vocal praise. The researchers used a reversal design for all students to demonstrate the effect of praise contingent on study behavior versus praise contingent on non-study behavior. They found increased studying rates when praise was contingent on study behavior, and low studying rates when praise was contingent on non-study behavior.

Another study that used praise focused on increasing pretend toy play. DiCarlo and Reid (2004) used praise as the reinforcer in a teaching program for five 2 to 3-year-old children with disabilities to increase pretend toy play. The teaching program included a choice among play areas, followed by prompting and praise if the child engaged with the toys. They found the teaching program that included praise was effective for increasing play rates for all 5 children.

As described previously, praise has been an effective means to increase a variety of behavior topographies. However, qualities of praise may vary based on how praise is delivered. In a seminal article, Brophy (1981) outlined guidelines of effective praise (e.g., delivered contingently, specifies particulars of the accomplishment; see Brophy (1981) for comprehensive list) derived from social learning/reinforcement theory. Multiple studies have used these guidelines to increase appropriate behavior (e.g., Blaze, Olmi, Mercer, Dufrene, & Tingstom, 2014; Conroy, Sutherland, Snyder, Al-Hendawi, & Vo, 2009; Conroy, Sutherland, Vo, Carr, & Ogston, 2014; McLaughlin, 1982; Sutherland,

Wehby, & Copeland, 2000). One study by Blaze et al. (2014) further focused on manipulating quality of praise by delivering quiet versus loud praise to high school students. The results of the study revealed both quiet and loud praise were effective compared to a baseline consisting of normal classroom routine. However, neither one emerged as being better than the other.

The study by Blaze et al. (2014) is interesting because it specified how praise is delivered and examined whether delivering different qualities of praise impacted its effectiveness (i.e., quiet vs. loud may be parameters of quality). Even though they didn't find a difference between qualities of praise through their methods, the authors acknowledge that certain types of praise may be reinforcing or punishing for certain students. For example, some students might prefer a specific type of praise. Elwell and Tiberio (1994) surveyed 279 female and 341 male 7th-12th grade students on teacher praise and found students prefer different types of praise and perceive it as important. For example, praising "all the time" and "praise loudly" were preferred by a majority of 7th and 8th graders, but were not preferred by a majority of 9th and 10th graders. Relatively few studies have singled out quality of praise delivered to children with disabilities. One way studies have examined quality of praise delivered to children with disabilities is by comparing descriptive versus general praise (cf., Polick et al., 2012; Stevens, Sidener, Reeve, & Sidener, 2011). General praise typically involves a statement of approval not related to immediate and specific behaviors (e.g., well done), whereas, descriptive praise typically involves a statement of approval as well as identification of the specific behavior being praised (e.g., well done, tying your shoe). The results of these studies reveal negligible differences between descriptive and general praise. However, other

studies comparing different types of praise have found some types of praise are better than others. For example, Chalk and Bizo (2004) compared the effects of specific praise to positive praise on student on-task behavior, academic self-concept (i.e., perceptions about themselves as learners and problem solvers), and numeracy enjoyment (i.e., enjoyment in engaging in math lessons). They found specific praise promoted more on-task behavior than positive praise and significantly increased academic self-concept. When considering most of the literature on different types of praise it may be identifiable features of praise produce different effects on behavior so more research is warranted. Indeed, as will be discussed later, when manipulating features of social interactions we see different effects on behavior.

Praise as a stimulus is typically thought of as a conditioned reinforcer, which means it acquires its effects through pairings with unconditioned reinforcers (e.g., food, water) (Pierce & Cheney, 2013; Skinner, 1953). Whether or not a particular form of praise has become a conditioned reinforcer may depend on an individual's history. Because we do not have access to reinforcement histories of our students/clients, researchers have developed approaches to determining which stimulus (in our case, which form of praise) is most or least preferred. Stimulus preference assessments (SPA) are used to determine preference for stimuli and potential reinforcing efficacy. There are many different forms of SPAs (see Hagopian, Long, & Rush, 2004 for a review). SPAs have been used to identify reinforcing stimuli for many individuals with language and communication deficits. Most stimulus preference assessments involve presenting stimuli to an individual and recording the individual's approaches or interaction with the stimuli being evaluated (e.g., DeLeon & Iwata, 1996; Fisher et al., 1992; Roane, Vollmer,

Ringdahl, & Marcus, 1998). Multiple studies have shown the effectiveness of delivering preferred tangible stimuli as reinforcers in acquisition of new skills (Cividini-Motta & Ahearn, 2013; Kang et al., 2013; Karsten & Carr, 2009). By extension, it may be useful to evaluate preference for various forms of praise using SPAs as this may predict their efficacy as reinforcers.

Social Interaction Preference Assessment

An area of emerging research is identifying preferred social interactions using preference assessments (e.g., Clay, Samaha, Bloom, Bogoev, & Boyle, 2013; Kelly, Roscoe, Hanley, & Schlichenmeyer, 2014; Nuernberger, Smith, Czapar, & Klatt, 2012; Smaby, MacDonald, Ahearn, & Dube, 2007). This area is important, as substituting sustainable reinforcers (e.g., delivering attention or praise) may replace edible reinforcers, which are frequently given to children with developmental disabilities. It also may be the case that edibles are contraindicated (e.g., individuals diagnosed with Prader-Willi syndrome) or that the frequent delivery of foods high in calories can lead to obesity later on in life (see Anzman, Rollins, & Birch, 2010; Kenny, 2011 for reviews).

Given that various different social interactions can have different reinforcing effectiveness (Clay et al., 2013; Kelly et al., 2014; Nuernberger et al., 2012; Smaby et al., 2007), it is important to consider whether praise delivered in different languages may vary in reinforcing power for ELLs. For example, if the target behavior to increase is shoe tying a teacher might say, “Muy bien, puedes amarrar tu zapato,” versus “very good, you can tie your shoe.” It could be that praise delivered in the student’s home or primary language is a more effective reinforcer or is more preferred than praise delivered in the

student's secondary language. Because praise is a conditioned reinforcer it could be that ELLs have longer history of praise in their home language being paired with unconditioned reinforcers in the home environment than praise in secondary language being paired with unconditioned reinforcers. That is, the child has had more experiences at home hearing praise in home language followed by delivery of unconditioned reinforcers as compared to the number of experiences of hearing praise in secondary language followed by delivery of unconditioned reinforcers. Indeed, previous research has shown conditioned reinforcing effectiveness of stimulus is directly related to the frequency of primary reinforcement (i.e., unconditioned reinforcement) (Kelleher & Gollub, 1962).

The effectiveness of a reinforcer also may depend on the arrangement and schedule value with which it is delivered. One arrangement is a single-operant arrangement. In a single-operant arrangement, a specific reinforcer is delivered following a specific behavior. For example, a teacher may provide praise (i.e., specific reinforcer) for a student raising her hand (i.e., specific behavior). In this example, the only behavior that will receive praise is hand raising. We may measure the frequency of hand raises to identify whether praise is an effective reinforcer. That is, if hand raising is increasing due to the consequence of delivery of praise. Some studies using single-operant arrangement, and delivering reinforcers on an FR 1 schedule, have demonstrated effectiveness of reinforcers corresponding to preference, that is, the high-preferred reinforcers generated the highest rates of responding and low-preferred reinforcers generated lowest rates of responding (Carr, Nicolson, & Higbee, 2000; Horrocks & Higbee, 2008; Lee, Yu, Martin, & Martin, 2010). Other applied studies using a single-operant arrangement, and

delivering reinforcers on an FR 1 schedule have found preference did not correspond to reinforcing efficacy, that is, rates of reinforcement generated by both high- and low-preferred stimuli are similar (Graff & Libby, 1999; Roscoe, Iwata, & Kahng, 1999). It is important to note that in these studies only one specific reinforcer was available following one specific behavior during each session. Other experimental basic research involving single-operant arrangements and progressive ratio schedules has found different stimuli presented at increasing response requirement ratios produce different patterns of behavior based upon the ratio (Bickel & Madden, 1999; Carroll, 1987; Hursh, 1984; Hursh, 1991; Jacobs & Bickel, 1999; Tustin, 1994). That is, stimulus A may be a more effective reinforcer than stimulus B at one ratio, but stimulus B may be a more effective reinforcer than stimulus A at another ratio. Thus, caution should be used when inferring absolute value of a reinforcer examined using a single-operant arrangement.

Another arrangement to determine the effectiveness of stimuli as reinforcers is a concurrent-operant arrangement in which multiple response options are present and responding on each one corresponds to a different consequence (i.e., delivery of a different stimulus). Response options usually involve the use of arbitrary tasks. These tasks are usually easily completed by participants, but are not associated with a dense learning history for the participants. They are used to control for variables that would affect rates or responding (e.g., history with a task, acquisition of a new task). Responding is measured on each option to determine the relative reinforcing efficacy of each consequence. Concurrent-operant arrangements have been used to examine preference for and reinforcing efficacy of stimuli (DeLeon et al., 2001; Fisher et al., 1992; Piazza, Fisher, Hagopian, Bowman, & Toole, 1996). The use of concurrent operant

arrangements provides a relative measure of reinforcing efficacy. Also, researchers have used concurrent operant arrangements because they may lead to clearer differentiation between preferred and non-preferred stimuli (Fisher et al., 1992; Herrnstein, 1970). Thus, concurrent operant arrangements may be effective in determining relative reinforcing value (Roscoe et al., 1999) of praise delivered in different languages.

One way to support improved progress in academic settings is to identify reinforcing social interactions and deliver them as consequences for task completion. If language of praise is found to be a reinforcer then it may mean that teachers could incorporate praise statements in a student's home language as effective rewards for task completion. It may also be a simple way to improve the effectiveness of praise for the teacher. The teacher would not be required to learn a new language entirely, but simply to incorporate new praise statements into their repertoire to be used as reinforcers for ELLs. This may be especially relevant with ELLs who qualify for special education services, as identifying reinforcers for children with disabilities may be more challenging. The identification of effective stimuli to be used as reinforcers has been accomplished through conducting preference assessments and reinforcer assessments, but this technology has not been applied to the population of ELLs in identifying language of praise as a potentially effective reinforcer. Therefore the purpose of this study is to:

1. Extend the use of paired stimulus preference assessment methodology (as used by Clay et al., 2013) to assess preference praise in home language or English in ELLs who have been diagnosed with a developmental disability.
2. Evaluate the relative effectiveness of praise delivered in the high-preferred and low-preferred language using an arbitrary task.

CHAPTER II

METHODS

Participants and Setting

Participants who were diagnosed with an intellectual or developmental disability were recruited through a local school district. To be included in the study, the children had to be bilingual with L1 being a majority of the language spoken at home, and L2 being the language typically used at school. They also had to be diagnosed with an intellectual or developmental disability, and be able to follow one-step instructions. A teacher from the local school district referred the students to the researchers. Eight bilingual children, four males and four females, began the study. Three children were excluded from the study for the following reasons. One male (Isaac) preferred non-social consequences over social consequences. This conclusion was drawn from results of an assessment where Isaac selected nothing over praise, and nothing over a combination of praise and toys (Figure 13). It was necessary that all participants were sensitive to social consequences because we were evaluating preference between social consequences (i.e., languages of praise). Another male (Devito) was excluded because he could not point independently, was non-vocal, and could not complete one-step instructions included in study. These skills were necessary to participate in the procedures included in this study. The third participant (Consuela) was female and was excluded because she demonstrated exclusive side bias. That is, when presented with multiple stimuli, she would only make selections toward one side, even when nothing was present on that side (Figure 14). Because measuring preference involves recording selection of different stimuli from

different locations, responding based on side bias may not have been a true representation of preference. This resulted in five bilingual participants, two males and three females, between the ages of 10-17. Sessions were conducted at the participants' school in a room containing two tables and five to six chairs. Other students were not present and there were minimal distractions.

Procedures

Language Assessment and Caregiver Interview

All participants were administered the picture portion of the Peabody Picture Vocabulary Test, Fourth Edition (PPVT™-4; Dunn & Dunn, 2012) by trained research assistants to establish a degree of English proficiency. All participants were also administered the picture portion of the Test de Vocabulario en Imágenes Peabody (TVIP; Padilla, Lugo, & Dunn, 1986) to establish a degree of Spanish proficiency. The PPVT-4 has an internal consistency reported as Spearman-Brown split half reliability at .94 and test-retest reliability at .93. The TVIP uses 125 translated items from the PPVT-R (Dunn & Dunn, 1981), and internal consistency reliability is reported to be .91 to .94. A receptive test had to be used due to one participant (Evita) who was non-vocal. A second observer was present during the assessment for the first three participants to ensure reliable scoring. Next, we interviewed caregivers to identify potentially preferred praise statements (e.g., "Muy bien" /"Very good," "¡Lo hiciste!"/ "You did it!") and to gain information on how the participant usually responded to praise. These praise statements were used in the subsequent preference assessment. These statements of praise were

translated and back-translated (Peña, 2007) into English and Spanish versions for use in the preference assessment.

Teaching Choice-Making to Audible Cue

Trials of preference assessments generally begin with a vocal instruction (e.g., "agarra uno" / "pick one"). It is possible that presenting the instruction in one language versus another might influence the participants' choices. It may be that participants have a history of selecting and using a language that matches the language of the most recent statement given by another speaker (cf. interlocutor sensitivity, Pettito, 2001). We did not want control by instruction language to mask preference for concurrently available options. (e.g., languages). Therefore, we taught students that a tone was an occasion for choosing among alternative options (i.e., it functioned similarly to the statement "pick one"). We needed to ensure that participants were able to make choices following an audible cue because the paired-stimulus assessment requires the participants to make a choice between two concurrently available options. The training procedures described below continued until the tone occasioned independent selection responses that met mastery criteria. It is important to note that vocal interactions were minimized throughout tone cue training and when the tone cue was being used.

First, we conducted a multiple-stimulus without replacement (MSWO; DeLeon & Iwata, 1996) preference assessment to identify a hierarchy of preference for multiple toys. The highest preferred stimulus was the stimulus selected, on average, before the selection of other stimuli. The lowest preferred stimulus was the stimulus selected, on average, following the selection of other stimuli. A moderately preferred stimulus was a

stimulus that was selected, on average, in the middle of the distribution as compared to other stimuli (see Figure 15). After we completed the MSWO we began trials in which the training occurred. At the beginning of each trial the participant was directed to stand in the middle of a predefined square area. Next, we placed the highest preferred item in one corner of a defined square area; no other items were present in the other corners. We delivered an auditory cue (e.g., a buzzer), and a therapist physically prompted using most-to-least prompting with a delay (MTLD; Libby, Weiss, Bancroft, & Ahearn, 2008) to guide the participant toward the corner with the high-preferred item, following which he or she received 30-s access to the item, and the trial ended. Before the start of each trial the item's location was moved from the left to right based on a pseudorandom number generator, with the constraint of not having more than three in a row of the same side placement. Following three trials with correct responses (i.e., the participant approached the item location immediately following the tone cue), the delay was increased by 1 s to promote unprompted, or independent, responding (Touchette & Howard, 1984). This procedure (i.e., the auditory cue, physical guidance to high-preferred item, 30-s access to the item, increasing the prompt delay) was conducted until mastery (i.e., 9 out of the last 10 trials independent) (see Figure 16). At this point we moved on to the pre-exposures with therapists and the paired-stimulus preference assessment.

Pre-Exposures and Therapists

Three therapists that speak Spanish and three therapists that speak English delivered praise throughout the study. Prior to the choice arrangement, participants were

pre-exposed to the language that was spoken by each therapist in the next set of choice trials. One pre-exposure session was conducted with one therapist that spoke Spanish, and one therapist that spoke English. During each pre-exposure session, the therapist only spoke the language assigned to him/her for the subsequent set of choice trials (i.e., the Spanish therapist spoke Spanish only in the pre-exposure, and the English therapist spoke English only in the pre-exposure). Each therapist was instructed to read a script containing 10 statements in the assigned language (see Appendix C). The script was translated and back-translated to ensure similar meaning (Brislin, 1986). The scripts were designed to introduce the therapist, explain that they speak the assigned language, and comment on items in the session room. Scripts were created because one trial exposure may not be enough to demonstrate to the child that the therapist speaks a specific language. The interactions were scripted to ensure the participants were getting equal exposure and quality of interaction with each therapist to maintain internal validity. That is, we did not want to bias the responding of the participants due to the addition of another variable (i.e., increased exposure time to therapists, better quality of interactions with therapists).

Paired-Stimulus Preference Assessment with Tracking Test

Following pre-exposure sessions (one with each therapist), we conducted the paired-stimulus preference assessment (PSPA). The assessment consisted of a series of trials. Each trial included the therapists arranged in separate corners of the same predefined area used in the choice-making training. At the beginning of the trial the participant was positioned in the center of the area. The same cue as used in the training

was delivered. Approaches towards each therapist resulted in the delivery of praise in the assigned language. Therapists used statements of praise identified by the Caregiver interview. To minimize potential effects of satiation, three statements were combined in the praise delivery and then randomly varied following each trial. For example, "Good job, awesome, that's right" may vary to "Awesome, that's right, good job." Therapists alternated left and right positions following each trial. However, this was creating biased responding in some of the participants (Frieda, Manuel, and Cesar). That is, participants were exclusively responding toward one side, regardless of the consequence. Selection toward one side resulted in undifferentiated response patterns because the therapists were alternating after every selection. We believed this led to results that were not a true representation of preference. We changed the procedure so the therapists would change left and right positions based on a pseudorandom schedule rather than strict alternation. For Frieda and Cesar, this manipulation solved the problem of side bias and subsequent responding occurred to both sides. Randomization of therapist side position was carried out for the remaining participants, and for all sessions in the PSPA with tracking test. This manipulation did not solve Manuel's side bias, so other modifications were necessary. We started by manipulating the magnitude of the praise in the concurrently available options, that is, we compared praise (Spanish and English) to no praise. The Spanish and English therapists alternated every other trial so the participant would have equal exposure to both therapists. In other words, in the first trial, the Spanish praise option was compared to no praise, then, in the next trial, the English praise option was compared to no praise, and so on. This manipulation resolved Manuel's side bias (i.e., he was subsequently responding to both the left and right sides). The preference assessment

was conducted over multiple blocks of five trials with a break between sets of three blocks.

To determine whether participants were selecting therapists based on preference for the language spoken and not other features of the therapist (e.g., shirt color, sex), we conducted a tracking test (Clay et al., 2013). Trials during the tracking test were identical to those in the paired stimulus preference assessment. We introduced two new sets of therapists that had no prior experience with the participant. The participants were pre-exposed to these new therapists (i.e., one English speaking and one Spanish speaking) and the paired preference assessment procedures were carried out as described above. This pre-exposure provided the participant experience with new therapists to increase stimulus control exerted by the therapists' presence signaling the respective language they speak. Although we were trying to limit stimulus control by other features of the therapists (i.e., gender, shirt color) we were also trying to increase stimulus control of the relevant feature we were investigating (i.e., language spoken). By bringing in new therapists, we ensured we could control the history they had with the participant (through pre-exposure). If data indicated that the child did not track the previously identified preferred language, this could indicate problems arising from interlocutor sensitivity (i.e., the language spoken by the therapist had not been established as a discriminative stimulus) or it could be because the language preference was not a replicable effect (i.e., there was no preference, preference changed, or there was preference for a particular therapist). Although this is not as convincing a demonstration as if they tracked the language within therapist sets, it helped establish that the participant tracks the language, regardless of the therapist. That is, if we included the same therapists within the set and

switched the language they spoke we may be better able to control for idiosyncratic features. However, bringing in new therapists and controlling for the history with the participant was also a demonstration of language tracking across therapists.

Reinforcer Assessment

Following the tracking test, we assessed the relative reinforcing value of the high- and low-preferred languages by using a free-operant reinforcer assessment. We initially used academic tasks, however, we switched to arbitrary responses due to lack of experimental control. That is, the participants were responding in the control condition in which there was no praise being delivered (see Figure 17 in Appendix B). Reinforcer assessments typically include conditions in which the stimulus is being delivered contingent on a response and when it is not being delivered contingent upon a response to determine if a stimulus is reinforcer. The condition in which the stimulus *is not* being delivered is referred to as the control condition. The condition in which the stimulus *is* being delivered is referred to as the test condition. If increased responding is seen in the test condition and not in the control condition, this suggests that the stimulus that was manipulated is a reinforcer. However, if responding is seen in the control condition, one cannot be sure the stimulus is a reinforcer. When we saw responding in the control condition, we hypothesized this was due to prior history completing academic tasks in the school context and/or that completing the task had become reinforcing in and of itself. Therefore, we used a novel, arbitrary response in the assessment for this phase of the study. We also wanted to eliminate the confounding variable of problems with response acquisition that may arise. That is, acquisition may affect the rate of responding due to

the learning curve. Pace, Ivancic, Edwards, Iwata, and Page (1985) conducted a similar procedure: first they determined relative preference for stimuli and next assessed the reinforcing value of those stimuli by providing the stimuli each time an arbitrary response was made by the subjects. Stimuli that produced higher levels of responding were deemed more reinforcing than those that produced relatively lower levels of responding. The advantage of using arbitrary responses (e.g., spot-touching, putting a block in bowl) is that they likely do not have strong histories of reinforcement, and are less likely to be influenced by other current environmental variables (e.g., hand-writing they were working on in class). Also, we chose a response that was relatively easy for the subjects to emit but would likely not persist in the absence of reinforcement. All sessions lasted 5 min. Visual inspection was used to determine when to change conditions.

We conducted the assessment using a concurrent operant design. In this assessment, responding for the following consequences was available depending on the condition: control (no praise was delivered for responding), praise in Spanish, and praise in English. For three participants (Frieda, César, and Mariana) a tangible option was added to the response options following multiple sessions of undifferentiated, low, or zero responding. In this option, participants could respond to earn tokens to be exchanged for access to a highly preferred item. Colored placemats and materials were used and corresponded to each concurrently available option (e.g., a red placemat had a red block and bowl). Identical tasks were available at each option; the only difference between the options was the color of the materials and the consequence provided. A distractor item (i.e., moderately to low preferred toy) was also present for all participants (except Manuel) that they could engage with to simulate the natural environment. A concurrent

operants design allowed us to directly compare the relative reinforcing value of the interactions to each other, and also allowed us to determine how reinforcing they are relative to no consequences at all. Prior to each session, a therapist would conduct a contingency sampling procedure by prompting subjects to emit the response for each option. The therapist began by saying, "When you do this, you get ____," and then demonstrated the response. If the participant did not begin to engage in the response the therapist would physically prompt the participant to complete the response. Therapists from the prior paired preference assessment delivered praise in whichever language was associated with the selected option until the subject had responded on each available option (i.e., nothing, low-preferred, or high-preferred form of language). The instruction was in English because that was the language in which instructions are typically delivered in participants' current classrooms. For some participants (Evita and Manuel) this contingency sampling was not sufficient to produce multiple responses once the free-operant session began. Therefore, we conducted an enhanced contingency sampling procedure in which the therapist would say, "when you do this, you get ____," and then demonstrate the response and consequence multiple times. The participant was then allowed to complete the response, would receive the consequence, and could continue engaging in the response until 3 s had elapsed without responding. After the contingency sampling procedure, one task was placed on the table for each consequence option (e.g., praise in Spanish, praise in English, no praise, tangible) depending on the condition. After tasks were placed on the table, the therapist said to the participant, "You can work on any of these options, you can work for as long as you want, you can switch the option

you are working on, or you don't have to work at all." Then the therapist started the session.

Response Measurement and Reliability

For the paired stimulus preference assessment trained observers recorded the participants' choices and therapist position (left or right) on each trial. Reliability of the observation system was scored by dividing agreements by agreements plus disagreements and multiplying by 100 to produce a percentage. Agreements were defined as both observers recording the same selection for each trial. A disagreement was defined as one observer recording a different selection from the other observer. A second observer took data on approximately 30% of the trials. Reliability was 100% for all participants.

During the reinforcer assessment we measured responding on arbitrary tasks that differed across participants. Cesar's and Mariana's task was to mate socks. A response was scored after the participant rolled the socks together, unrolled the socks, and set them down. Evita's and Manuel's task was to move a block from one bowl to another bowl. A response was scored after the participant picked up the block, moved it to a different bowl and the block made contact with the bottom of the bowl. Frieda's task was spot touching. A response was scored after she touched a colored spot on the wall and then sat in a chair of matching color. We trained observers to use Observe! Software using the video training described by Dempsey, Iwata, Fritz, and Rolider (2012). Observers recorded the participants' responses on each response option (i.e., Spanish praise, English praise, tangible, no praise). A second observer took data on approximately 30% of the trials. Average agreement within intervals was calculated by dividing the smaller number

of responses by the larger number of responses scored by observers in each interval, averaging across all intervals, and multiplying by 100 to obtain a percentage. Intervals in which neither observer recorded a response were scored as an agreement, or a value of 1. Intervals in which only one observer recorded no occurrences of behavior were scored as a disagreement, or a value of 0. Mean reliability for Evita was 93.6% (range 77%-100%). Mean reliability for Cesar was 95.8% (range 80% to 100%). Mean reliability for Frieda was 87.1% (range 80% to 97%). Mean reliability for Manuel was 100% and mean reliability for Mariana was also 100%.

CHAPTER III

RESULTS

Language Assessments: PPVT and TVIP

Results on the PPVT and the TVIP varied for all participants (see Figure 1 in Appendix B). All but one of the participants performed better on the Spanish assessment than the English assessment (Table 1 in Appendix A). We converted all scores into age equivalents based on charts provided in the PPVT and TVIP. Evita's age equivalent was 6 years 5 months in English converted from the raw score on the PPVT, and an age equivalent of 5 years 1 month on the TVIP. This suggested Evita had a slightly more advanced receptive vocabulary in English than in Spanish. Manuel's age equivalent was 5 years 5 months on the PPVT, and 2 years 6 months on the TVIP, suggesting Manuel had a more advanced receptive vocabulary in English than in Spanish. Frieda's age equivalent was 7 years 5 months on the PPVT, and 3 years 5 months on the TVIP, suggesting Frieda had a more advanced receptive vocabulary in English than in Spanish. Mariana's age equivalent was 5 years 7 months on the PPVT, and 5 years 8 months on the TVIP, suggesting Mariana had a more advanced receptive vocabulary in Spanish than English. Cesar's age equivalent was 8 years 3 months on the PPVT, and 6 years 6 months on the TVIP, suggesting Cesar had a more advanced receptive vocabulary in English than in Spanish (results are summarized in Table 1 in Appendix A). All age equivalents based on raw scores were much lower than all actual ages of the participants. This suggests they had receptive vocabularies lower than their peers of similar age in both L1 and L2.

Paired-Stimulus Preference Assessment with Tracking Test

In this assessment we provided the option to select between Spanish and English praise (and no praise for Manuel) options to determine measures of preference. Results from this assessment are depicted in Figures 2 through 6. Overall, two participants (Evita and Mariana) preferred Spanish praise to English praise, and three participants (Cesar, Frieda, Manuel) did not have a preference between Spanish or English praise. That is, their data were undifferentiated across three sets of therapists comparing Spanish and English praise. Evita's data are depicted in Figure 2 in Appendix B. Percentage of selections between Spanish and English therapists are depicted in the top panel. When choosing between the first set of therapists, Evita selected the Spanish therapist more frequently than the English therapist. Evita's responding was undifferentiated between the second set of therapists. We reversed back to the first set of therapists and again saw a preference for Spanish to English. We then introduced a third set of therapists and saw a preference for Spanish over English, replicating the data from the first set of therapists, and suggesting that Evita was tracking Spanish praise across therapists (i.e., she was selecting the therapist delivering the Spanish praise more frequently even when it was delivered by different therapists). In the bottom panel are depicted side selections for Evita. We saw varied responding to the left and right sides suggesting Evita did not have a side bias and may have been tracking a preferred language across therapist sets. Mariana's results are depicted in Figure 3 in Appendix B. In the top panel are depicted percent of selections between Spanish and English therapists. Mariana's responding was undifferentiated when we introduced the first set of therapists. When we introduced the second set of therapists we saw more responding allocated to the praise in Spanish. We

again saw preference for praise in Spanish when we introduced the third set of therapists, replicating the previous phase and suggesting Mariana preferred Spanish praise to English praise. In the bottom panel are depicted side selections for Mariana. We saw varied responding to the left and right sides suggesting Mariana did not have a side bias and may have been tracking a preferred language across therapist sets.

Cesar's results are depicted in Figure 4 in Appendix B. In the first condition, the first set of therapists were alternating sides each trial. Cesar's responding was undifferentiated between the first set of therapists. We also saw exclusive responding to the right side during this condition (bottom panel of Figure 4 in Appendix B). When we randomized when the therapists switched sides, we saw responding towards both sides, and selection between English and Spanish praise was undifferentiated. When we introduced the second set of therapists we again saw undifferentiated responding. This pattern was replicated when we introduced the third set of therapists suggesting Cesar did not prefer Spanish to English praise or English to Spanish praise. Results for Frieda's PSPA were similar to Cesar's. Frieda's results can be seen in Figure 4 in Appendix B. During exposure to the first set of therapists we saw slight preference for English to Spanish praise, however her responding was exclusively allocated to the left side. When we randomized when the therapists switched sides we saw responding toward both sides, and an undifferentiated pattern of responding between Spanish and English praise. This suggested she also did not prefer praise in one language to the other.

Manuel's results are depicted in Figure 6 in Appendix B. In the top panel are depicted percent of selections between Spanish therapists, English therapists, no praise options. Sex of the therapist is also represented by male and female symbols. Data

patterns for the first two conditions for Manuel were similar to Cesar and Frieda's. When we introduced the first set of therapists we saw undifferentiated responding between Spanish and English praise, and exclusive responding to the left side. Following randomizing when the therapists switched sides we continued to see undifferentiated responding, and side bias to the left. This led to introduction of a magnitude manipulation. In the magnitude manipulation we decreased the magnitude of one option by removing praise delivered on that option, and then comparing that option to an option where either Spanish or English praise was available. Following this we saw allocation of responding to both sides, and increased selection toward the option where praise was present. In the next condition we attempted to replicate the second condition, comparing Spanish praise to English praise involving the first set of therapists. During this condition we saw exclusive responding toward the Spanish praise option. We then introduced a second set of therapists and saw exclusive responding toward the English praise option. We observed that the participant had exclusively selected females across the sets of therapists, suggesting responding was being influenced by features of the therapists other than the language in which praise was delivered. In the next condition we controlled for gender bias by comparing male therapists only, and saw undifferentiated responding. We then compared female therapists only and again saw undifferentiated responding; we also saw exclusive side bias to the left in this condition. The reemergence of the side bias led us to reintroduce the magnitude manipulation in the next condition. Following the magnitude manipulation we saw responding toward both sides, and increased selection toward the praise option. This condition replicated the previous condition in which a magnitude manipulation was made to eliminate side bias. These results provide evidence

that Manuel was sensitive to social praise, that is, he preferred praise to nothing. However, we saw undifferentiated responding when comparing Spanish and English praise, when controlling for sex of the therapist, suggesting he did not prefer one to the other.

Reinforcer Assessment

We used a concurrent operant arrangement to measure response rates on multiple identical task options to assess the reinforcing efficacy of different consequences. Slight procedural modifications were made across participants based on participant responding. For example, we began conducting this assessment using academic tasks, but then switched to arbitrary tasks. This was done because all participants were responding in the control condition suggesting there may have been contextual control over responding. This manipulation, and others, will be discussed participant-by-participant in the following sections.

Results of the reinforcer assessment for Evita are depicted in Figure 7 in Appendix B. In the top panel session-by-session rates of responding are shown, and in the bottom panel moving average rates, within conditions, across two session increments are shown. Response rates were low and at zero in baseline. Moving average response rates were graphed to provide clarity for visual inspection of the data. Moving averages make trends in the data easier to identify. When we compared praise in English, Spanish, and no praise consequences we initially observed increasing average response rates for all options. We saw the largest increase in responding after implementing the enhanced contingency sampling (Session 10). At session block 26 we began to see a decreasing

trend for the no praise option. Beginning at session block 30, we observed decreases in responding in the English praise option, while responding in the Spanish praise option maintained at a higher level. Overall we saw the highest response rates in the Spanish praise option, on average 2.59 responses per minute (range 0.4-6.6). For the English praise option we saw on average 1.91 responses per minute (range 0-4.8). These results provide evidence that Spanish praise was a more effective reinforcer than English praise and no praise consequences. However, there was variability across response patterns for all consequences so conclusions drawn about how consistently reinforcing an option was should be interpreted with caution.

Results for Mariana are depicted in Figure 8 in Appendix B. In the top panel session-by-session rates of responding are depicted, and in the bottom panel moving average rates of responding within each condition across two session increments are depicted. We did not see any responding in baseline for Mariana. To begin, we compared English and Spanish praise options without a no praise option because we hypothesized the inclusion of the no praise option may have had an effect on responding. When we compared English and Spanish praise options we did not see any responding. In the next condition we compared English praise, Spanish praise, no praise, and tangible consequences. We did not see any responding for English praise or no praise consequences. We observed higher rates of responding for tangible and Spanish praise consequences. The highest rate of responding was observed for tangible consequences with an average response rate of 5.56 responses per minute (range 0-13). The next highest rate of responding was observed for Spanish praise with an average response rate of 2.32 responses per minute (range 0-10.4). These results provide evidence that tangible

consequences may be the most effective reinforcer. However, responding was highly variable, so this interpretation should be taken with caution. Additionally, Spanish praise was seen to be a more effective reinforcer than English praise or no praise, once the tangible option was introduced. The addition of other options to respond on may have had an effect on responding, as we did not see responding until they were added. However, we did not have experimental control of this manipulation so firm conclusions cannot be drawn.

Results for Manuel are depicted in Figure 9 in Appendix B. In the top panel session-by-session response rates are depicted. In the bottom panel are displayed within condition moving average response rates (across two session increments). No responding was observed in baseline for Manuel. In the next condition we compared Spanish praise, English praise, and no praise consequences. We did not have evidence that including all options would have an effect on response rates so all options were included. We saw no responding followed by an increase in response rates for Spanish and English praise following implementation of the enhanced contingency sampling. However, we saw exclusive responding on one option during each session. The option Manuel was exclusively responding on varied from session to session. We identified this pattern of responding as undifferentiated; suggesting Manuel did not prefer one language of praise to another. This result corresponded with results on the PSPA suggesting that Manuel did not prefer one language of praise to another. That is, the PSPA predicted relative reinforcing efficacy of the different languages of praise. However, the patterns of responding made observing trends in data difficult. The moving average graph provides a slightly different picture of trends in responding across sessions. Using this graph we

observed low to zero rates of responding for the no praise consequence. We saw a moderate level of responding for Spanish praise. Toward the end of the condition we saw an increasing trend and high rates of responding for English praise. Overall, responding in the Spanish praise option averaged 3.12 responses per minute (range 0-13.6), and responding in the English praise option averaged 4 responses per minute (range 0-16.4). Results from the moving average graph provide evidence that English praise may have been a slightly more effective reinforcer than Spanish praise and no praise consequences for Manuel. However, the conclusion drawn from this analysis of the data should be taken with caution because the session-by-session data were highly variable.

Results for Cesar are depicted in Figure 10 in Appendix B. Session-by-session response rates are displayed in the top panel, and moving average response rates, within each condition, across two session increments are displayed in the bottom panel. The break in the x-axis signifies data that were omitted due to a change in therapists only on this day of sessions, creating an internal validity confound. That is, the same therapists conducted every other day of sessions, but were not able to be present for the day in which we omitted data. We saw low to zero levels of responding in baseline. In the next condition we compared Spanish praise to English praise and responding was undifferentiated. We hypothesized the addition of other options to respond on might have an effect on responding for Cesar similar to Mariana. Thus, in the next condition we compared Spanish praise, English praise, tangible and no praise consequences. We observed responding for the no praise consequence at low to zero levels. Responding for tangible, Spanish praise, and English praise appeared to be undifferentiated. These results correspond to outcomes on the PSPA suggesting Cesar did not prefer one language of

praise to another. However, when we graphed a moving average across this condition (bottom panel Figure 10 in Appendix B) we observed an increasing trend in response rates in the tangible and Spanish praise response options. Furthermore, we observed decreasing rates in the no praise option, and variable, but low rates of responding in the English praise option. The results drawn from this analysis of the data provide evidence that tangible consequences served as the most effective reinforcer, and Spanish praise served as a more effective reinforcer than English praise and no praise consequences.

Results for Frieda are depicted in Figure 11 in Appendix B. Session-by-session response rates are displayed in the top panel; moving average response rates are displayed in the bottom panel. These moving averages were calculated within each condition, across two session increments. In the first condition we saw increasing rates of responding for the no praise option. In the next condition, we compared Spanish and English praise and saw decreasing rates of responding for both of these consequences. In the third condition we compared Spanish praise, English praise, tangible, and no praise options and saw undifferentiated responding among all options. Because we saw undifferentiated responding between no praise and praise options it was impossible to identify relative reinforcing efficacy of praise in different languages for Frieda. Furthermore, we did not see differentiation with the addition of a tangible option making it impossible to draw conclusions about the reinforcing efficacy of social consequences. However, these results correspond to data from the PSPA suggesting Frieda did not prefer one language to another. One might predict stimuli are not reinforcing if there is not a strong preference for them. Also, it is possible that the environment was providing contextual control over Frieda's responding. That is, the programmed consequences (i.e.,

praise statements, tangibles, no praise) might not have had as much control over Frieda's responding as the context. Also, weak preference for available consequences might lead one to predict antecedent stimuli will control responding.

Figure 12 in Appendix B depicts correspondence between the PSPA and the reinforcer assessment for all participants on Spanish and English praise data. On the left y-axis is the percentage of trials the participant selected Spanish or English praise across all of the trials in which they were compared in the PSPA. On the right y-axis is percentage of total responses allocated to Spanish praise or English praise consequences in the final phase of each participant's reinforcer assessment (SR+). Data points above the PSPA label on the x-axis are graphed using the left y-axis, and data points above the SR+ label are graphed using the right y-axis. Evita and Mariana had similar results. On average they selected Spanish more frequently during the PSPA than English. They also responded more for Spanish praise in the reinforcer assessment. These results reflect a correspondence between preference for Spanish praise and reinforcing efficacy of Spanish praise relative to English praise. In other words, the preference assessment predicted reinforcing efficacy of praise stimuli for Evita and Mariana. These results also correspond to conclusions drawn from both the session-by-session and moving averages graphs for Evita and Mariana.

Results for Cesar indicate English and Spanish praise were both selected the same percentage of the time in the PSPA, however Spanish appears to maintain a slightly higher percentage of total responding in the reinforcer assessment. These results correspond to conclusions drawn from the moving average graph of Cesar's data. That is, Spanish praise appears to be slightly more reinforcing than English praise, and these

results might not have been predicted by the PSPA. However, conclusions drawn from Cesar's session-by-session reinforcer assessment data suggest that responding was undifferentiated, which corresponds to outcomes on the PSPA. In other words, relative reinforcing efficacy of Spanish and English praise was the same; and this was predicted by the PSPA, which revealed undifferentiated preference. Session-by-session data may be a more sensitive measure of reinforcing efficacy, which leads to the conclusion that results of PSPA predicted results on the reinforcer assessment. It should also be noted that the difference between the percentage of total responses for Spanish and English praise was very small as depicted on the correspondence graph. This difference may not be meaningful considering total responding includes extreme outliers that may skew the data. In other words, total responding results may not be as sensitive of a measure as session-by-session results.

Manuel's results were similar to Cesar's. Manuel selected Spanish praise slightly more than English praise in the PSPA, as can be seen in total percentage of trials selected. Interestingly, English praise appears to have maintained slightly more responding than Spanish praise in the reinforcer assessment. These data appear to not show correspondence between the two assessments (i.e., the PSPA did not predict outcomes of the reinforcer assessment when viewing total percentage of trials data). However, initial results from the PSPA revealed undifferentiated responding, which corresponds to conclusions drawn from Manuel's session-by-session data in the reinforcer assessment. That is, the PSPA predicted results for the reinforcer assessment when using what may be considered a more sensitive measure. These results are similar to Cesar's in that small differences were seen when totaling percentage of responding. This measure might not be

sensitive enough to interpret these small differences as meaningful. That is, combining total percentages of responding across an entire condition creates a molar perspective in which small differences may not be as important as large differences.

For Frieda, total percentage of trials selected in the PSPA was the same for Spanish and English praise. Furthermore, percentage of total responses in the reinforcer assessment was extremely close (23.5 % of responses for Spanish and 23.1 % of responses for English) and for practical purposes can be interpreted as the same. This leads us to conclude that results of the PSPA also corresponded to results of the reinforcer assessment for Frieda. That is, the PSPA accurately predicted relative reinforcing efficacy of Spanish and English praise.

CHAPTER IV

DISCUSSION

The results of this study are relevant to answering socially significant questions posed by educators working with ELLs with disabilities. The language used in schools may be different in terms of what is preferred and reinforcing to each individual ELL. For example, praise delivered in one language may be more reinforcing for these students than praise delivered in another language. Our results suggest that if a participant preferred a specific language of praise it was more reinforcing than a less preferred language of praise, or no praise (see Table 2 in Appendix A for summary). If a participant did not prefer a specific language of praise (i.e., undifferentiated preference) both languages were equally reinforcing, or praise could not be determined to be a reinforcer (as was the case for Frieda). More specifically, preference outcomes predicted relative reinforcing efficacy outcomes for all participants. Surprisingly, measures of receptive language proficiency only predicted relative reinforcer efficacy for one of the participants (Mariana). Furthermore, home language (Spanish) was more reinforcing for two of five participants (Mariana and Evita), and may have been slightly more reinforcing for one participant (Cesar) when examining overall responding. Also of note for these two participants (Mariana and Evita), their within participant English and Spanish language proficiency scores were very similar. This information could be used to more effectively identify what types of praise will likely function as reinforcers for ELLs. Additionally, if praise in home language is preferred, using it as a more effective reinforcer would add to supporting home language use in schools.

An interesting modification was made with the addition of the enhanced contingency sampling. Demonstrating the target response and consequence multiple times and allowing the participants to engage in the response multiple times, as opposed to one time, seemed to increase response rates during the sessions. This modification was correlated, specifically with an increase in response rates for Evita and Manuel in the reinforcer assessment. This allowed us to see differentiation across the options. However, we did not have experimental control over this effect so we cannot conclude the increased response rates were a direct effect of the enhanced contingency sampling.

The language being used in our participants' classroom was English. Our data suggest that there may be benefits if Spanish praise is implemented in the classroom for students that prefer that language (especially in praise statements) and may be able to increase responding on academic tasks. However, we were not able to directly demonstrate this supposition, likely due to the context (i.e., history of completing academic tasks in school setting) influencing continued responding in the control option confounding experimental control. In other words, participants were responding on the academic tasks because of their long history of compliance on academic tasks, reducing sensitivity of the effect of consequences on responding. Generalization of the reinforcing efficacy of Spanish language praise on academic tasks may be seen for students that prefer Spanish language. If this generalization were to occur, teachers could add praise statements in the student's home language to their repertoire to be included as effective rewards for task completion. This may be a simple modification that would lead to a teacher having more effective vocal praise.

One limitation of this study was the use of arbitrary responses to assess reinforcing efficacy of language of praise. Because we did not use typical responses (i.e., academic tasks) in the participants' environment it is unclear if the reinforcing effects of using different language praise statements would generalize to typical classroom responses. The effects demonstrated in our study may also be seen to generalize to tasks with which the participant does not have a long history. Examples of these types of tasks may be tasks that are in acquisition. Indeed, it's likely the participants did not have any experience with the arbitrary task so learning and acquisition was present. However, the potential lack of generalizability may limit the social validity of the study.

A second limitation of the study was the personnel intensive methodology for identifying preference and reinforcing efficacy for language of praise. A total of eight different therapists were needed at various points in the study. Considering the U.S. national average teacher-to-pupil ratio is approximately 16 students to one teacher (IES, 2015), having eight teachers or therapists available may be difficult, if not impossible. Additionally, it is very difficult to locate dual-language proficient, highly-qualified immersion teachers (Coffman, 1992). Having enough bilingual therapists to satisfy the methodology demands of the study may also be unrealistic. Thus, specific personnel are needed in addition to multiple therapists.

A third limitation of the study was that we only assessed reinforcing efficacy of language of praise at one ratio value for most participants. We assessed other ratio values (FR 2, FR 4, FR 5) during the preliminary investigations using academic tasks. However, we did not do a true parametric analysis and cannot draw conclusions from responding at these schedule values. As was discussed in the introduction, different stimuli's

reinforcing efficacy may vary at different schedules of reinforcement. Also, the use of leaner schedules of reinforcement may be more indicative of a student's typical work environment. That is, a teacher likely provides praise after a student has made multiple responses (e.g., completing a worksheet). To address this issue, progressive ratio schedules may be used in the future to assess reinforcing efficacy of language of praise. Also, assessments that systematically increase the response requirement (i.e., parametrically examining higher ratio schedules) could be used to examine differences between different languages of praise sustaining responding better than others at certain values. Conclusions drawn from results of these procedures could provide a more thorough account of the conditions under which specific language praise statements may be most effective.

This study extends previous research in preference and reinforcer assessment, research with ELLs, and research on praise. It extends research in preference and reinforcer assessment by using methods of the attention PSPA (Clay et al., 2013) leading to identifying preferred social stimuli that also serve as reinforcers. Furthermore, this study conceptualized language as a dimension of social stimuli that can be assessed for preference and reinforcing efficacy. Additionally, results add more evidence to recent literature investigating the reinforcing efficacy of social interactions (e.g., praise). It also adds to the literature on praise by providing data showing praise may be an effective reinforcer. Praise was shown to be a reinforcer for four out of five participants. Furthermore, our conclusions suggest that qualities of praise may be differentially preferred and differentially effective at reinforcing behavior. Three of five participants' results contradict some previous findings that different qualities of praise did not produce

different effects (Blaze et al., 2014; Polick et al., 2012; Stevens et al., 2011). Although, different types of praise were examined in those studies (i.e., language of praise was not examined). Two of five participants' results support other research suggesting that different qualities of praise may be differentially preferred (Elwell & Tiberio, 1994). Teachers and other caregivers might also consider changing the language of praise to increase the quality to improve the effectiveness of praise in some cases.

This study extends research in the field of language by providing a demonstration of reinforcing efficacy of preferred language, and adds further evidence to the research done by Paradis et al., (2011) and others to support usage of home language in school. The number of participants that demonstrated reinforcing efficacy of a preferred language may limit our results. However, the reinforcing value of L1 could be applied to strengthening multiple responses in ELLs with disabilities for those that may prefer L1, increasing the repertoires of these individuals and setting them up for success. Our findings also have implications for parents continuing to use home language with ELLs in the home. Because home language (Spanish) praise was more effective as a reinforcer for some participants, parents of ELLs should consider continuing to speak home language despite other theories (i.e., limited capacity hypothesis).

Furthermore, this study adds evidence that usage of L1 could potentially lead to better outcomes in schools, as it may be used as a powerful reward to motivate academic task completion in ELLs. As Genesee (1987) pointed out, positive interdependence between L1 and L2 has been found to produce advantages in academic ability. The results from this study may support the use of L1 if preference for L1 is present in ELLs,

and also provide preliminary evidence for a strategy that we can use to include L1 in a school context.

Future researchers should consider some of the issues that we encountered while conducting this study. For example, we encountered problems with stimulus similarity, response selection, and context selection. These issues may be resolved by future research in this area and the development of new methodologies to be included in the assessment of social stimuli.

First, for three of the five participants (Frieda, Cesar, and Mariana), we did not see differences in preference between similar reinforcers (i.e., same praise statements in two different languages) at low ratio values. Tustin (1994) and DeLeon, Iwata, Goh, and Worsdell (1997) also found little to no differences when comparing similar reinforcers. However, when Tustin increased the response requirement for both reinforcers, preference emerged. Conversely, DeLeon's results differed from Tustin's in that they did not obtain differences in preference across increasing schedule values. It may be the case in our study that praise in Spanish and English are similar reinforcers, and differences in preference could not be revealed at the low ratio values we selected. However, for Cesar and Mariana, the introduction of earning tokens to be exchanged for toys (i.e., a dissimilar reinforcer) seemed to result in differences in preference. That is, the addition of a dissimilar stimulus in the concurrent operant reinforcer assessment resulted in clearer differentiation among all options. It may be that the addition of a dissimilar stimulus has a similar effect as increasing response requirement, when assessing relative reinforcing efficacy. Also of note the duration of praise was relatively short. Future studies could

explore the use of longer social interactions, in addition to the effects of dissimilar stimuli.

Second, results of this study may emphasize the need for considering the context in which a study is conducted. It may be that the context alone can already maintain responding. Multiple subjects (Frieda, Evita, and Cesar) in this study responded in baseline, or control, on tasks in which there was no programmed consequence. This suggests there may have been other features in the environment that influenced the participants' responding, such as the context (i.e., school setting/workstation). Contextual control can be developed due to the subject's history, and influence responding. Contextual control can be conceptualized as a form of complex stimulus control in which the context (i.e., school setting/workstation) serves as a higher order event that alters the probability of response, or possibly a class of responses (Haring & Kennedy, 1990; Michael, 1982; Wahler & Fox, 1981). This control could increase the likelihood that a response such as academic task completion may be occurring. This may be particularly apparent with an intervention to change behavior involving reinforcement. Indeed, behavioral researchers have documented effects of context on interventions, involving reinforcement, on decreasing rates of problem behavior (cf. Haring & Kennedy, 1990). That is, an intervention was effective in one context (task context) yet the same intervention, involving reinforcement, was not effective in another context (leisure context). In sum, consideration of the context in which a study will be conducted should take place before assessing preference and reinforcing efficacy of different stimuli may be in order.

Third, our results suggest responding may also have been influenced by the selection of tasks which we used to measure reinforcer efficacy. All participants showed undifferentiated responding across all options when we conducted a reinforcer assessment using an academic task (see Figure 17 in Appendix B). However, when we substituted an arbitrary task we saw differentiated responding (between test and control conditions) in the reinforcer assessment for four of the five participants (Evita, Mariana, Cesar, and Manuel). Previous researchers have used tasks that may be "arbitrary" or otherwise when conducting reinforcer assessments (DeLeon & Iwata, 1996; Higbee, Carr, & Harrison, 2000; Pace et al., 1985). However, there do not seem to be methods set up to identify the "arbitrariness" of the tasks. Variables such as the subject's history with the task, instruction, and rule following all may influence how a subject responds on a task. That is, there may be extraneous stimuli associated with a task identified as "arbitrary" that are exerting stimulus control over responding making the task not "arbitrary." These same variables may maintain responding on a task. It was necessary in our study to use arbitrary tasks to establish experimental control, that is, participant responding on test options versus responding on control options. Our hypothesis was that the academic task was exerting contextual control over responding versus consequences we were manipulating exerting control over responding. This seemed be the case as we were able to establish experimental control after including the arbitrary tasks. Our results suggest these considerations, and ways to identify and select arbitrary tasks should be considered in future reinforcer assessment research.

Finally, in addition to the future research recommendations mentioned previously, future research may look at how to ensure teachers take advantage of use of preferred

language. A main goal of identifying preferred and reinforcing stimuli is to apply these stimuli in socially significant ways and to create meaningful changes in students' lives. This could be done in a number of ways. Instruction in a preferred language could be investigated and potentially lead to better outcomes for ELLs. For example, addressing the effects of delivering preferred language of instruction on rates of acquisition of new skills. Also, examining language preference may inform teachers how to program augmentative and alternative communication (AAC) devices. That is, if a student prefers one language to another we may support client values by including more statements in the student's preferred language. Data on language preference may also be useful for teachers as they construct goals for individualized education plans (IEP). For example, teachers can construct goals that incorporate targets that involve the student progressing in L1. An example of a goal may be, "The student will learn names of, and be able to identify, five animals in their home language." Furthermore, these data may help teachers advocate for more support in L1 in a student's classroom. More support may come in the form of including bilingual aides, or simply introducing the teacher to some phrases in the student's home language.

Additionally, examining language preference before behavior assessment and before implementing behavior interventions may provide useful knowledge. Durán, Bloom, and Samaha (2013) described a culturally and linguistically responsive functional behavior assessment (FBA) in which the therapist only spoke Spanish. They found access to adult attention was maintaining the client's aggression. Although the researchers did not assess language preference before the behavior assessment, the language adaptation likely played a role in being able to identify the function of the client's aggression.

Furthermore, language preference assessment before conducting functional communication training (FCT), could identify valuable information. It may be the case that using a preferred language would increase the likelihood students would acquire and use a response trained using FCT. Many benefits may arise involving the assessment language preference. Ultimately, incorporation of language preference could lead to improved outcomes for ELLs.

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APPENDICES

Appendix A

Tables

Table 1

Age Equivalent Scores on PPVT-4 and TVIP

Participant	PPVT-4 (English)	TVIP (Spanish)
Cesar	8 years 3 months	6 years 6 months
Mariana	5 years 7 months	5 years 8 months
Evita	6 years 5 months	5 years 1 month
Frieda	7 years 5 months	3 years 5 months
Manuel	5 years 5 months	2 years 6 months

Table 2

Summary of Age Equivalent Language Proficiency and Assessment Outcomes

Participant	English	Spanish	PSPA	SR+
Mariana	5-7	5-8	Spanish	Spanish
Evita	6-5	5-1	Spanish	Spanish
Frieda	7-5	3-5	Undiffer.	Undiffer.
Manuel	5-5	2-6	Undiffer.	Undiffer.
Cesar	8-3	6-6	Undiffer.	Undiffer.

Appendix B

Figures

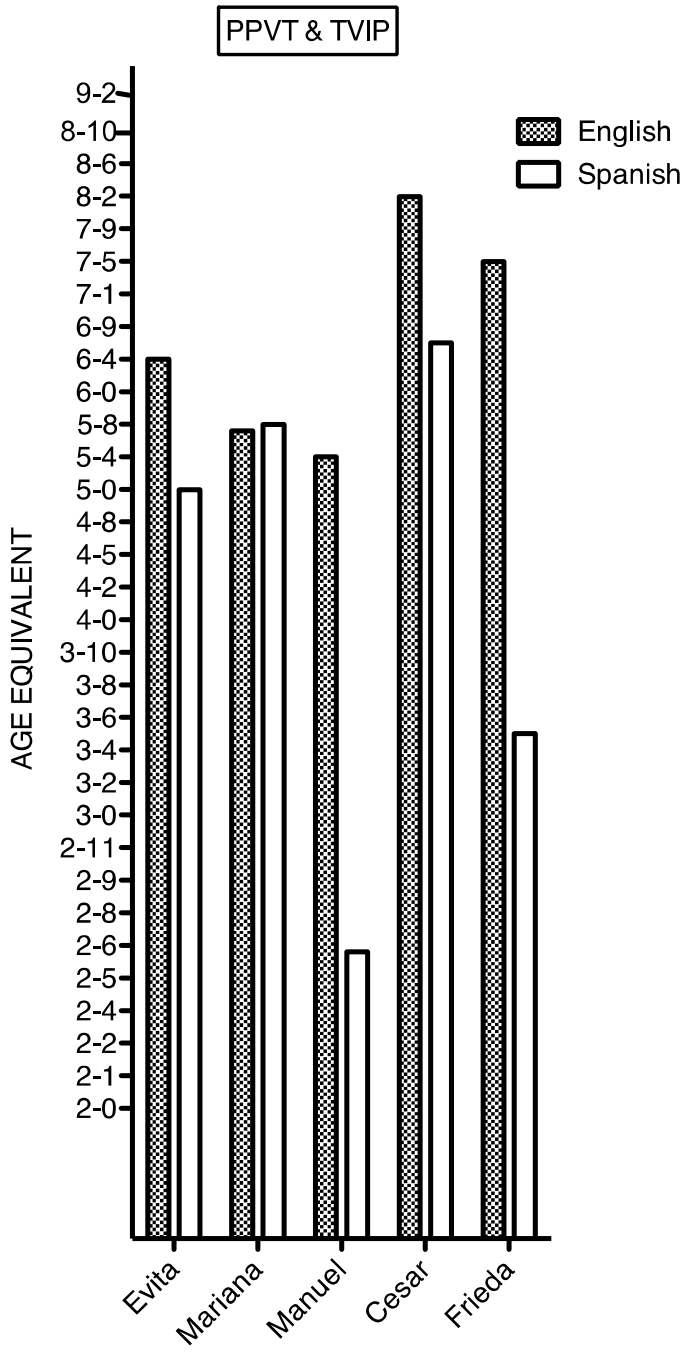

Figure 1. Age equivalents converted from scores on the PPVT and TVIP for all participants. Measures of receptive language are depicted in the bar graph for English and Spanish languages based on age equivalent metrics.

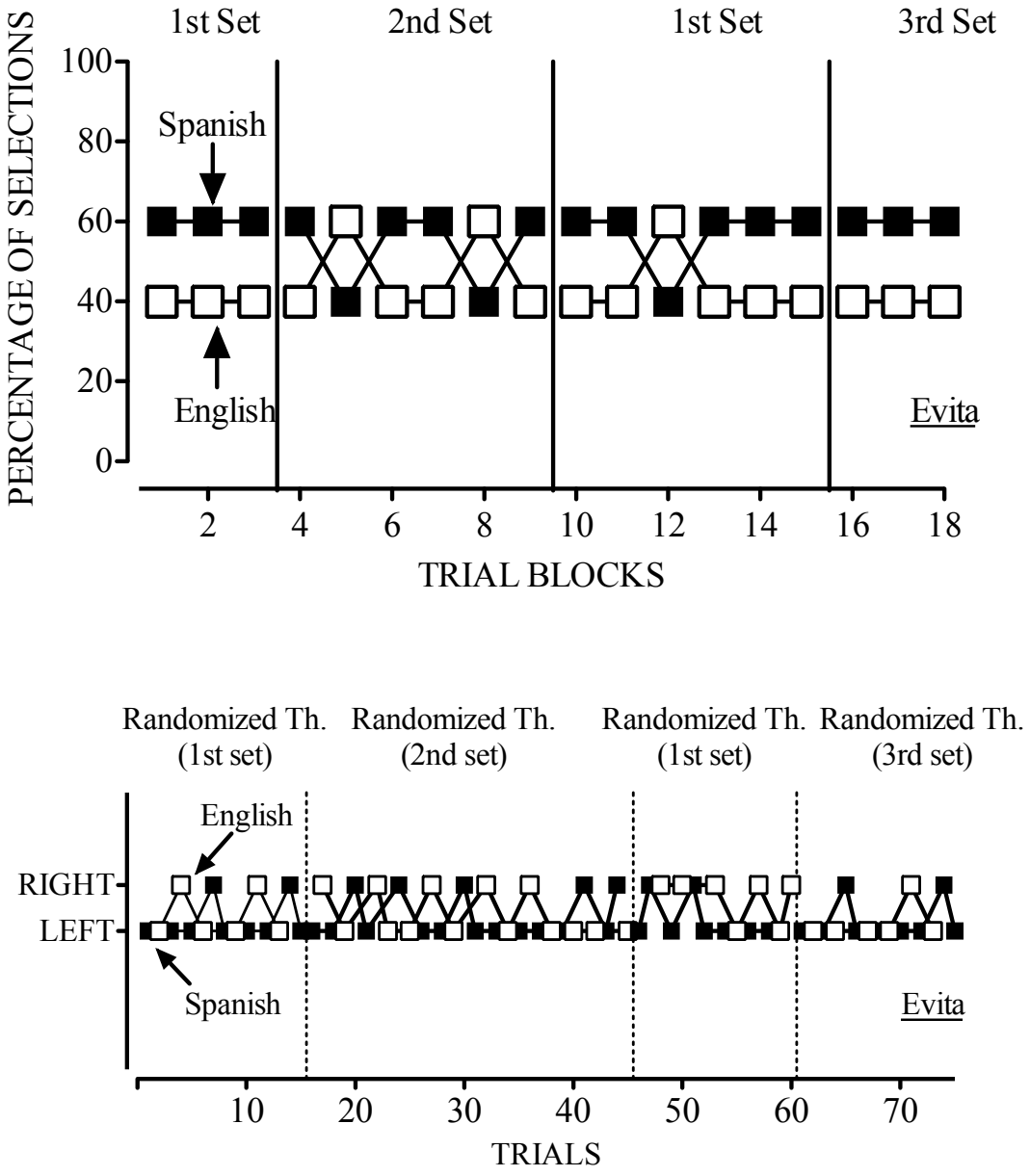

Figure 2. Evita's results on the PSPA with tracking test. In the top panel is percentage of selections during the PSPA. Trial-by-trial selection allocation by position of therapist is depicted in the bottom panel. Closed squares are percentage of selections of Spanish therapist and open squares are percentage of selections of English therapist.

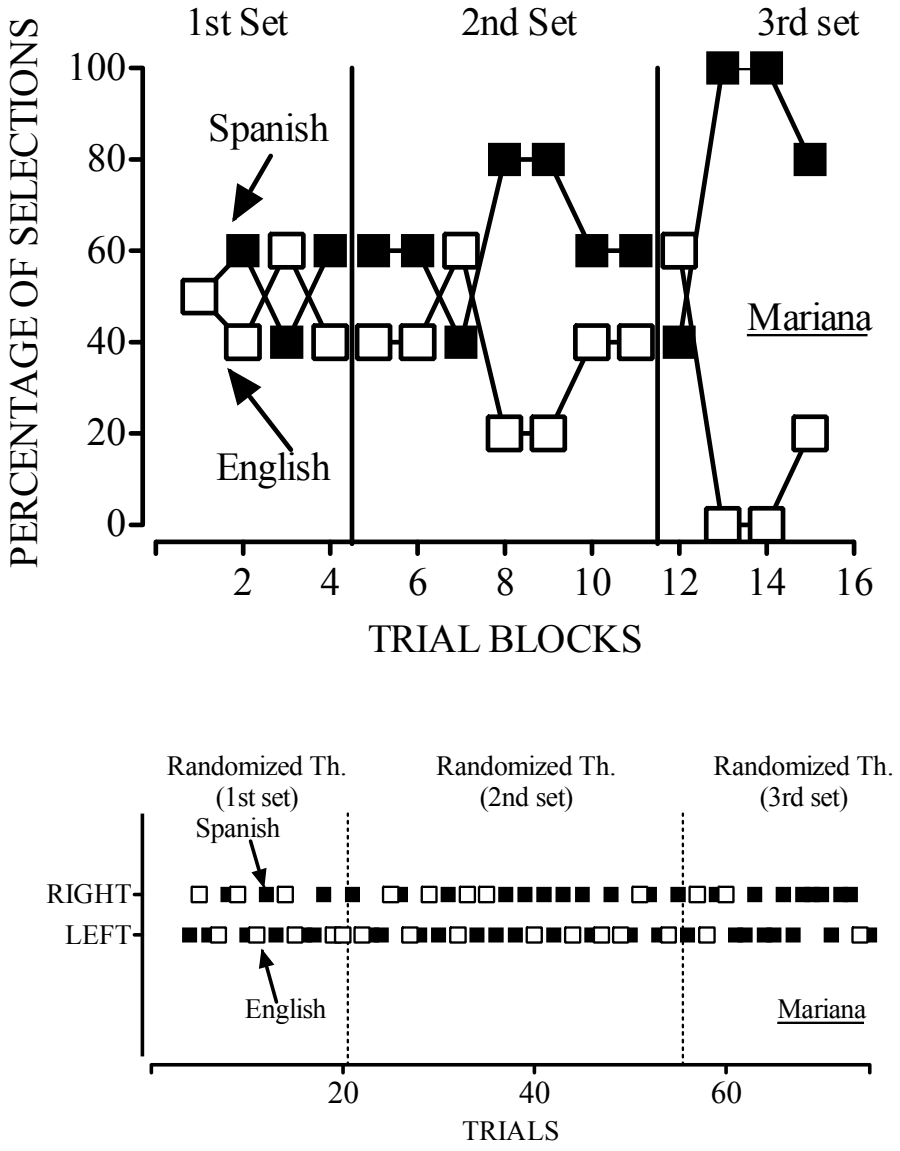

Figure 3. Mariana's results on the PSPA with tracking test. In the top panel is the percentage of selections during the PSPA are depicted. In the bottom panel, selection allocation by position of therapist is depicted. Closed squares are percentage of selections of Spanish therapist and open squares are percentage of selections of English therapist.

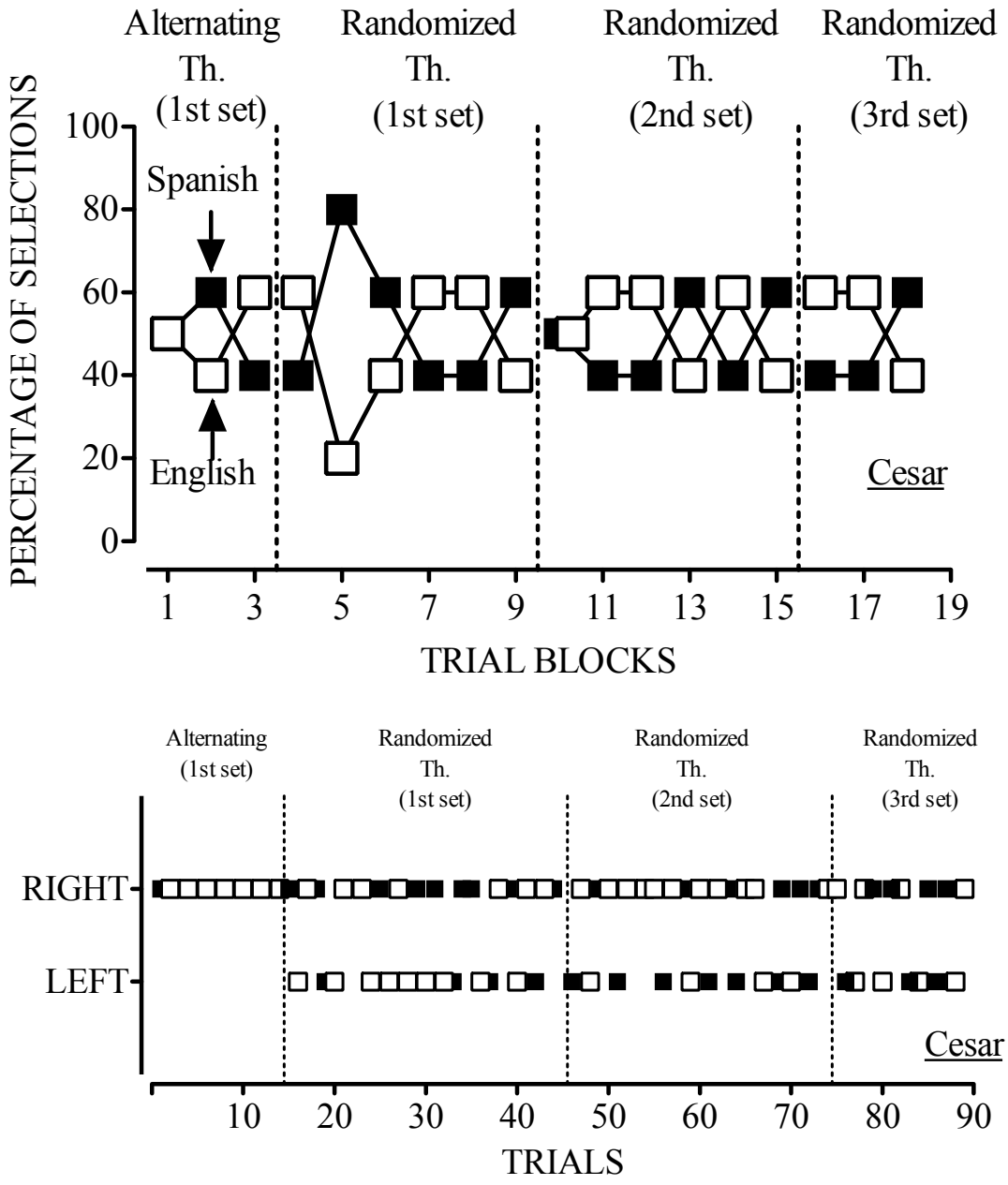

Figure 4. Cesar's results on the PSPA with tracking test. In the top panel the percentage of selections during the PSPA are depicted. In the bottom panel, trial-by-trial selection allocation by position of therapist is depicted. Closed squares are percentage of selections of Spanish therapist and open squares are percentage of selections of English therapist.

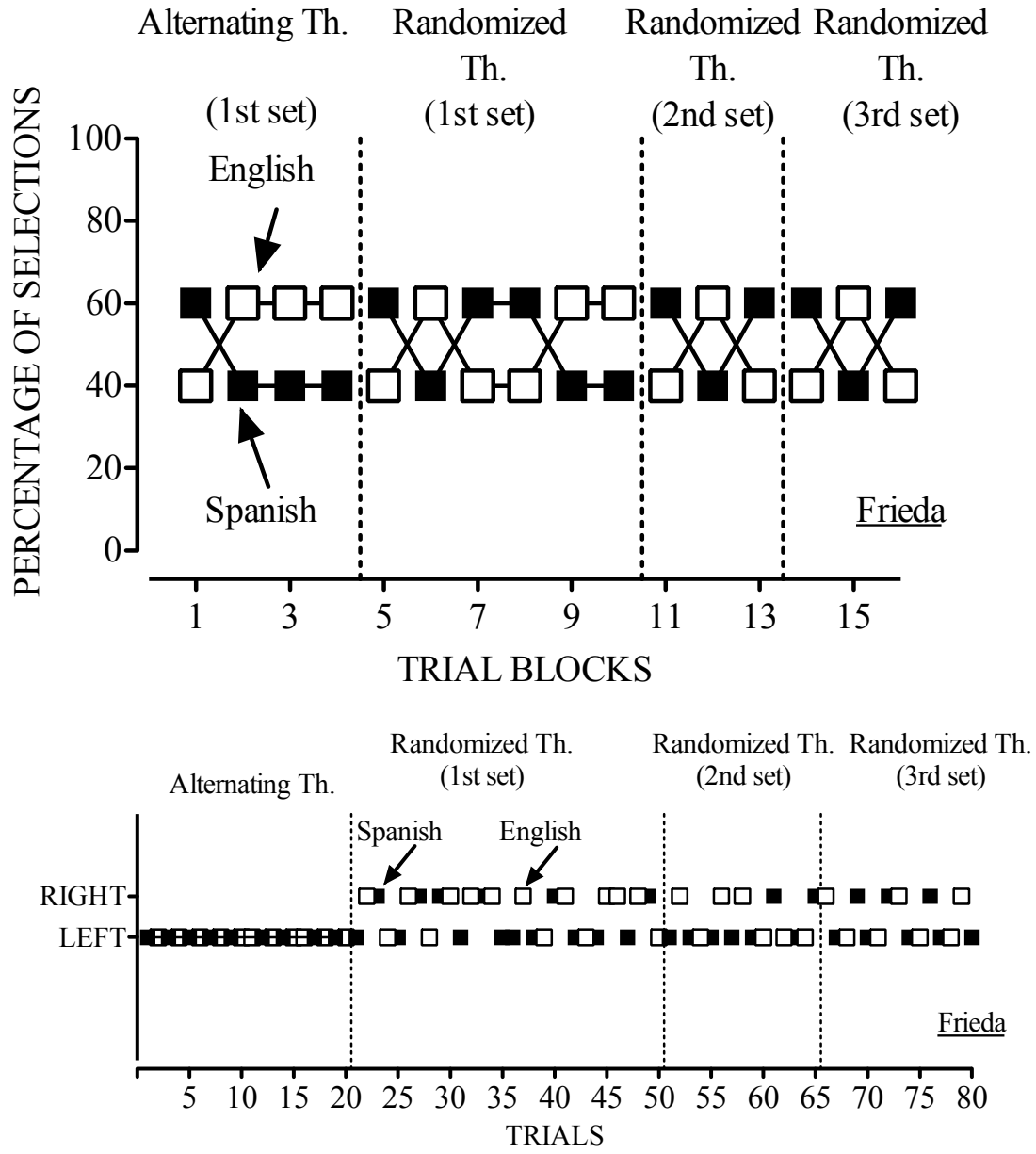

Figure 5. Frieda's results on the PSPA with tracking test. In the top panel the percentage of selections during the PSPA is depicted. In the bottom panel, trial-by-trial selection allocation by position of therapist is depicted. Closed squares are percentage of selections of Spanish therapist and open squares are percentage of selections of English therapist.

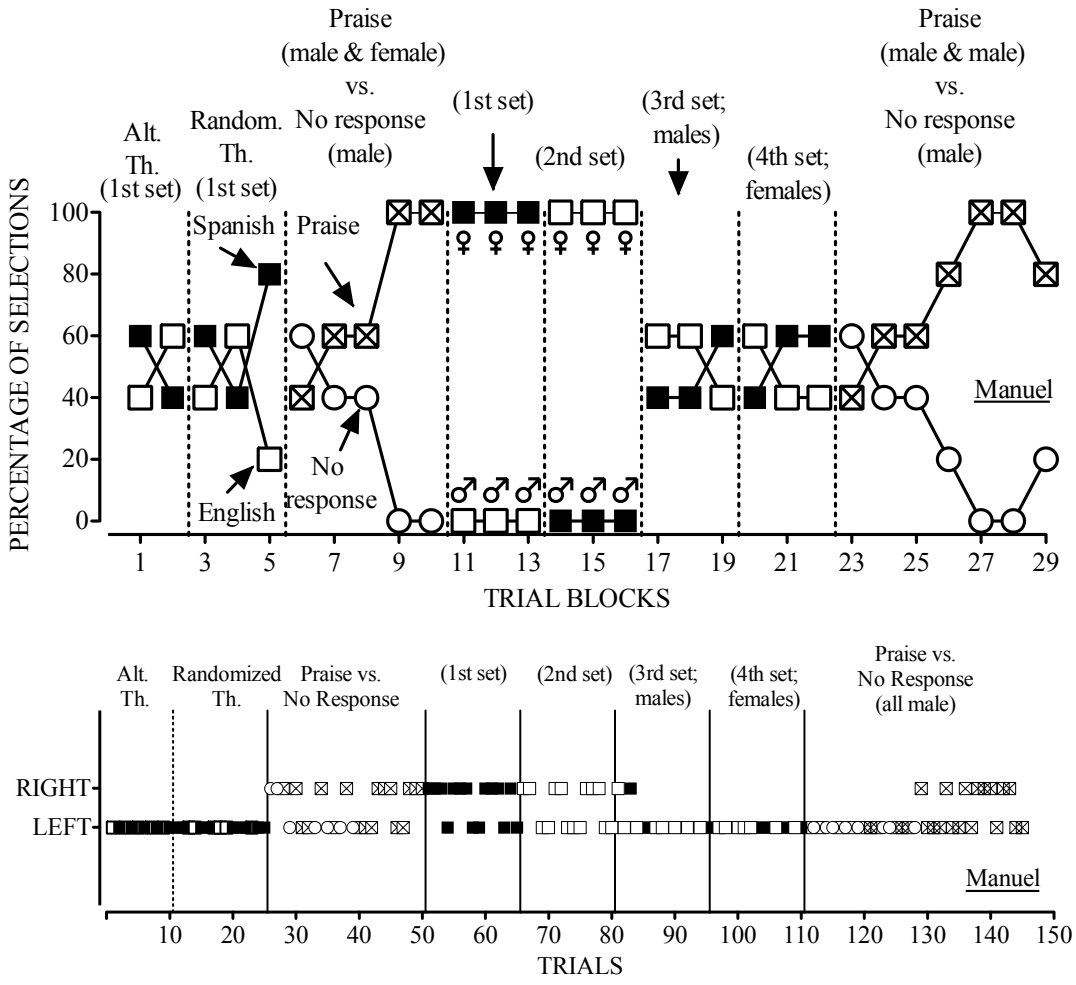

Figure 6. Manuel's results on the PSPA with tracking test. In the top panel the percentage of selections during the PSPA is depicted. In the bottom panel, trial-by-trial selection allocation by position of therapist is depicted. Closed squares are percentage of selections of Spanish therapist and open squares are percentage of selections of English therapist. Squares with an "x" are percentage of selections of praise (alternating Spanish and English therapists). Open circles are selections in which no response was delivered by therapists. Sex of therapist is indicated by Mars (male) and Venus (female) symbols.

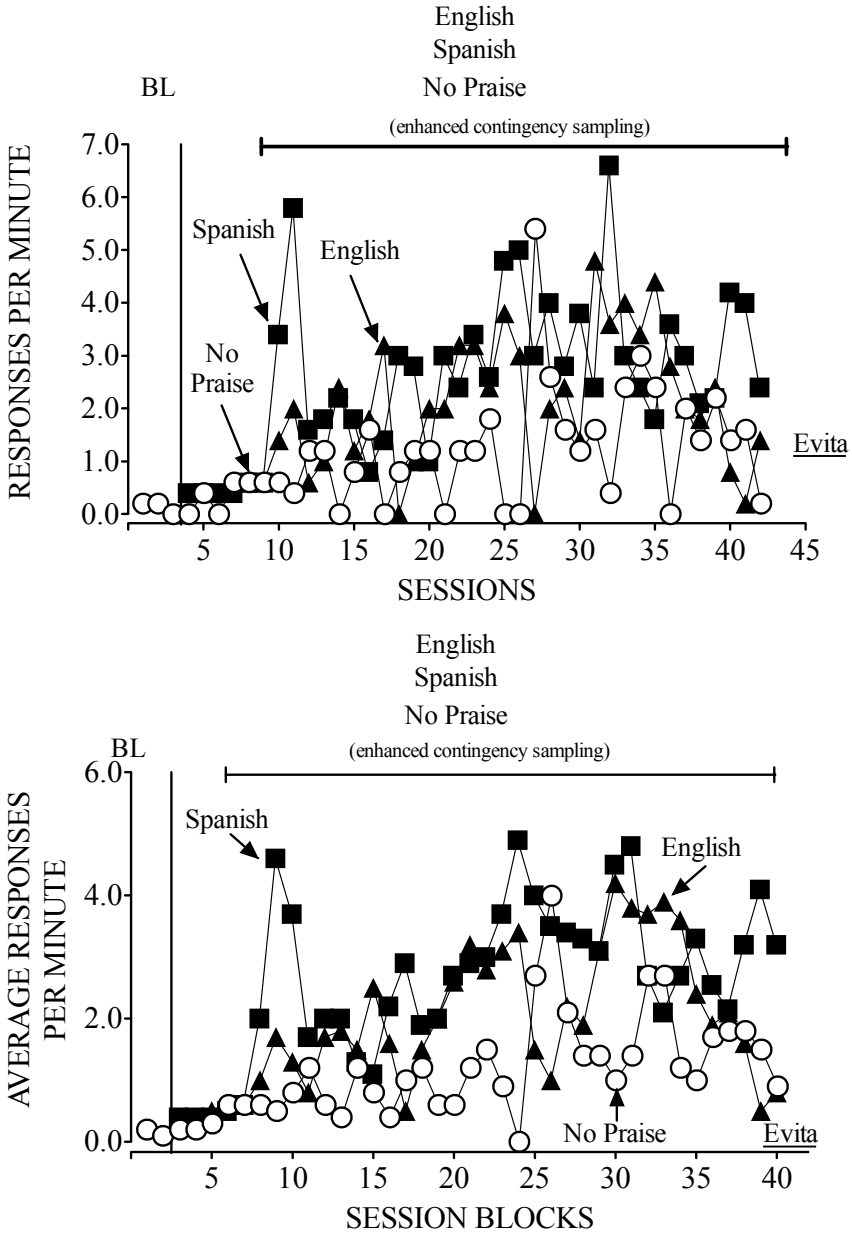

Figure 7. Results of the reinforcer assessment for Evita. In the top panel session-by-session response rates are depicted. In the bottom panel moving average response rates, within each condition, across two session increments are depicted. Open circles denote responding on the no praise option. Closed squares denote responding on the Spanish praise option. Closed triangles denote responding on the English praise option.

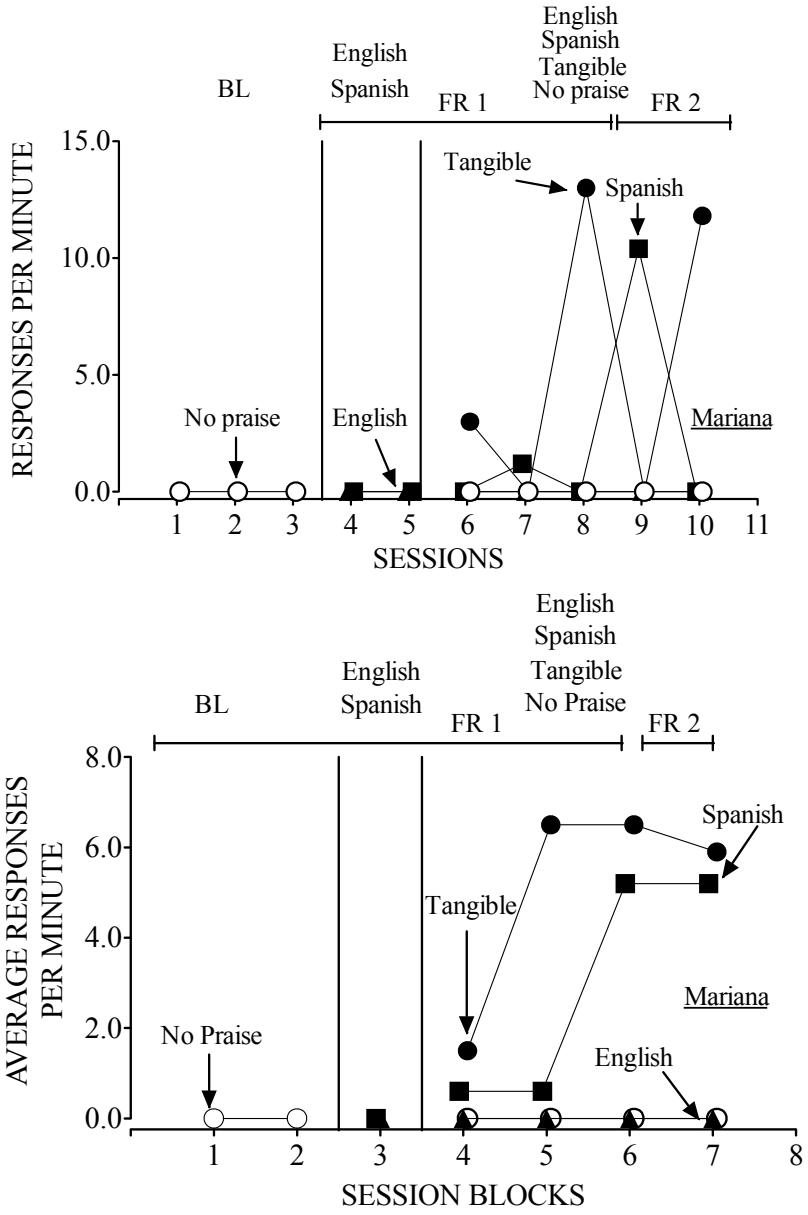

Figure 8. Results of the reinforcer assessment for Mariana. In the top panel session-by-session response rates are depicted. In the bottom panel moving average response rates, within each condition, across two session increments are depicted. Open circles denote responding on the no praise option. Closed circles denote responding on the tangible option. Closed squares denote responding on the Spanish praise option. Closed triangles denote responding on the English praise option.

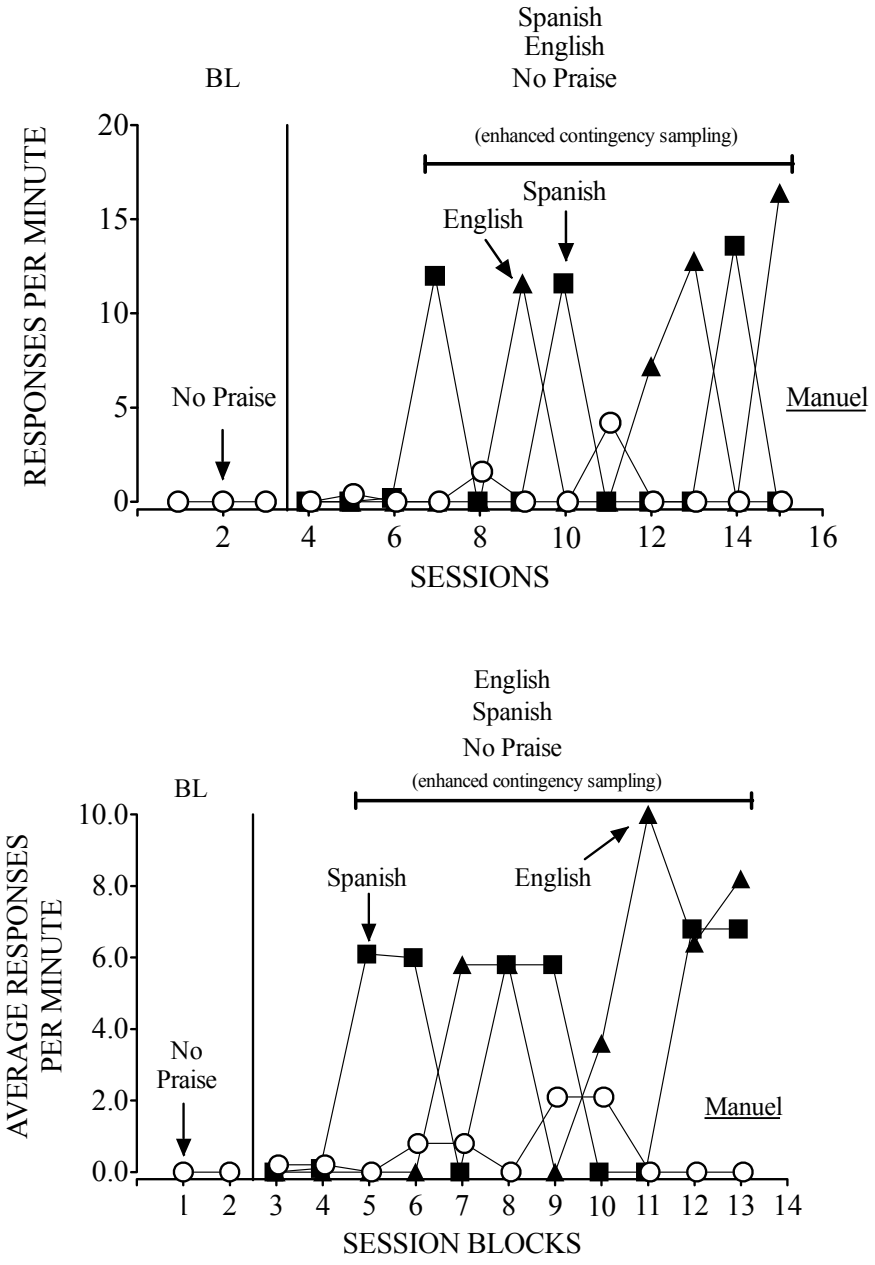

Figure 9. Results of the reinforcer assessment for Manuel. In the top panel session-by-session response rates are depicted. In the bottom panel moving average response rates, within each condition, across two session increments are depicted. Open circles denote responding on the no praise option. Closed squares denote responding on the Spanish praise option. Closed triangles denote responding on the English praise option.

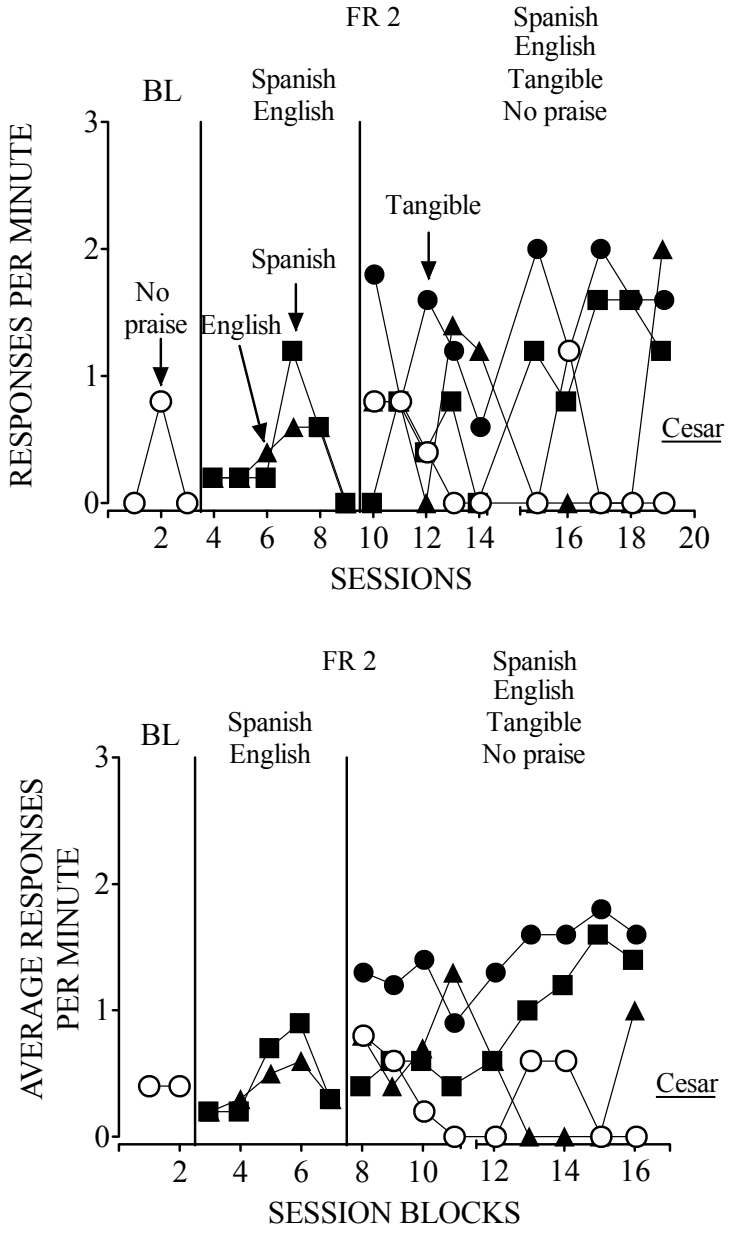

Figure 10. Results of the reinforcer assessment for Cesar. In the top panel session-by-session response rates are depicted. In the bottom panel moving average response rates, within each condition, across two session increments are depicted. Open circles denote responding on the no praise option. Closed circles denote responding on the tangible option. Closed squares denote responding on the Spanish praise option. Closed triangles denote responding on the English praise option.

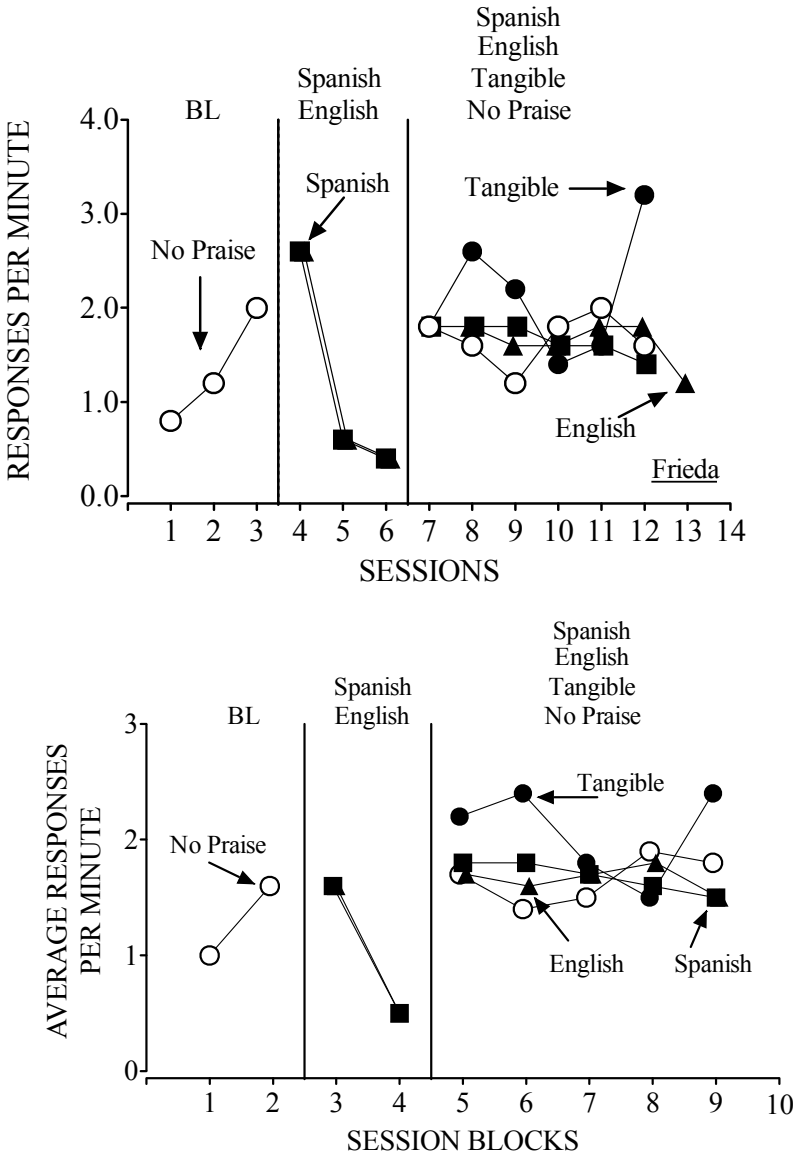

Figure 11. Results of the reinforcer assessment for Frieda. In the top panel session-by-session response rates are depicted. In the bottom panel moving average response rates, within each condition, across two session increments are depicted. Open circles denote responding on the no praise option. Closed circles denote responding on the tangible option. Closed squares denote responding on the Spanish praise option. Closed triangles denote responding on the English praise option.

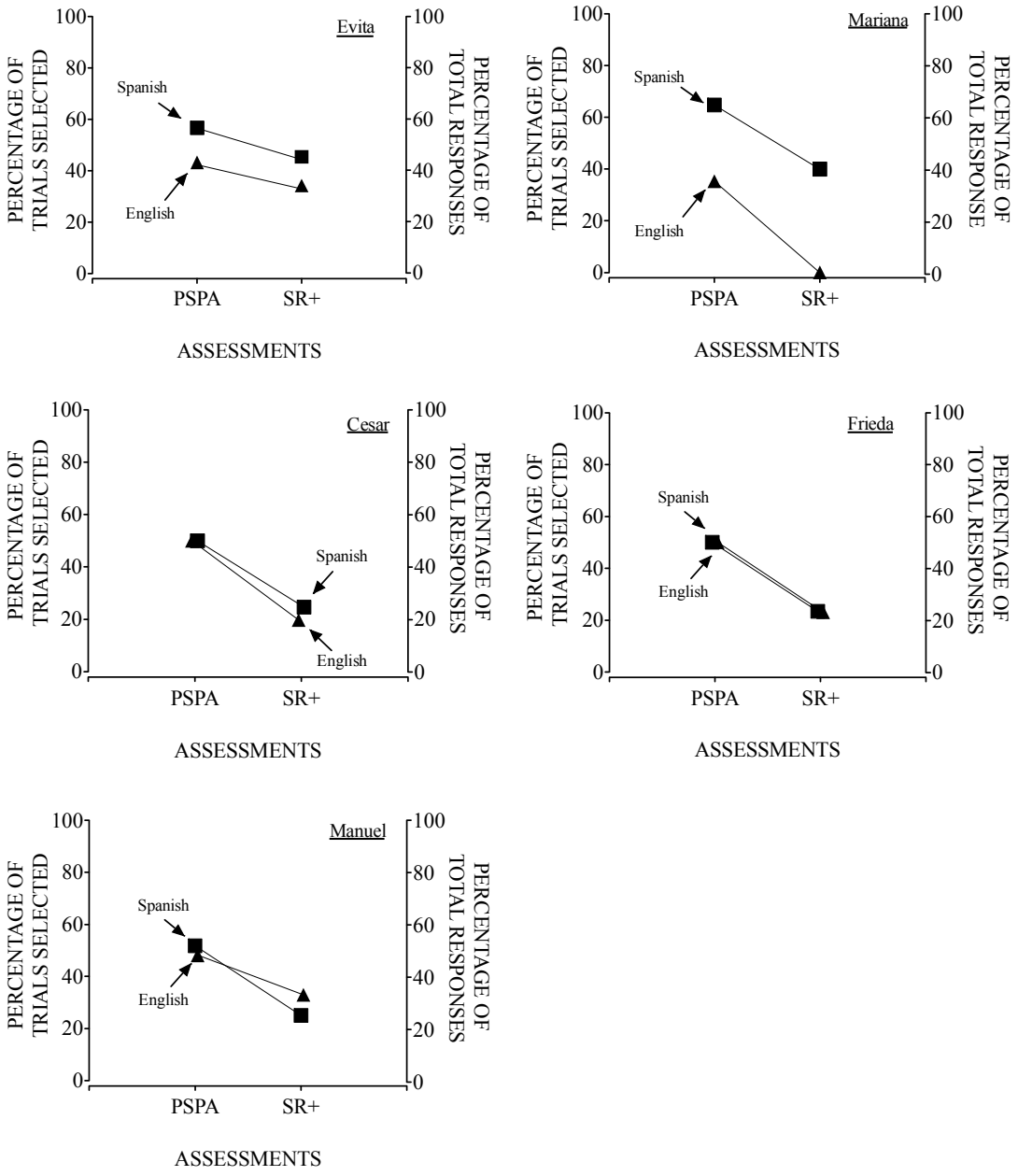

Figure 12. Results from the PSPA and reinforcer assessment (SR+) graphed as a function of percentage of trials selected and percentage of total responses. Closed squares denote the percentage of total trials Spanish praise was selected in the PSPA and the percentage of total responses that were allocated toward Spanish praise in the reinforcer assessment. Closed triangles denote the percentage of total trials English praise was selected in the PSPA and the percentage of total responses that were allocated toward English praise in the reinforcer assessment.

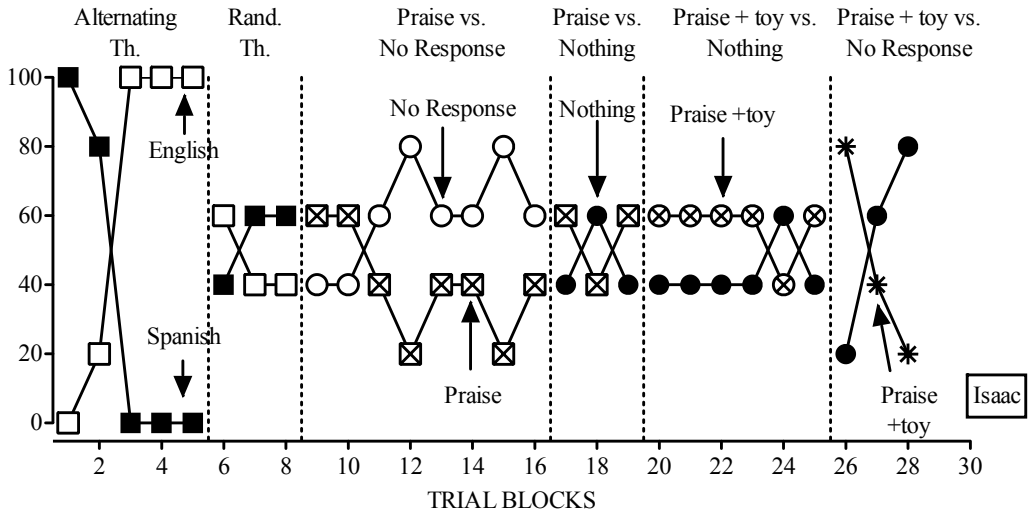

Figure 13. Results from Isaac's paired stimulus preference assessment. Exclusive preference emerged in the first condition because he began to only make selections toward one side. After we randomized the side position of the therapists we saw undifferentiated responding. In the next conditions we saw evidence that he did not have a clear preference for social consequences when compared to receiving nothing. We attempted to make social consequences more preferable by adding a high-preferred toy that was delivered at the same time as praise, however clear preference for social consequences was still not seen. In the last condition he was selecting no response more than social consequences, suggesting he did not prefer social consequences or they might have been potentially aversive. Therefore, he was excluded from further participation in the study.

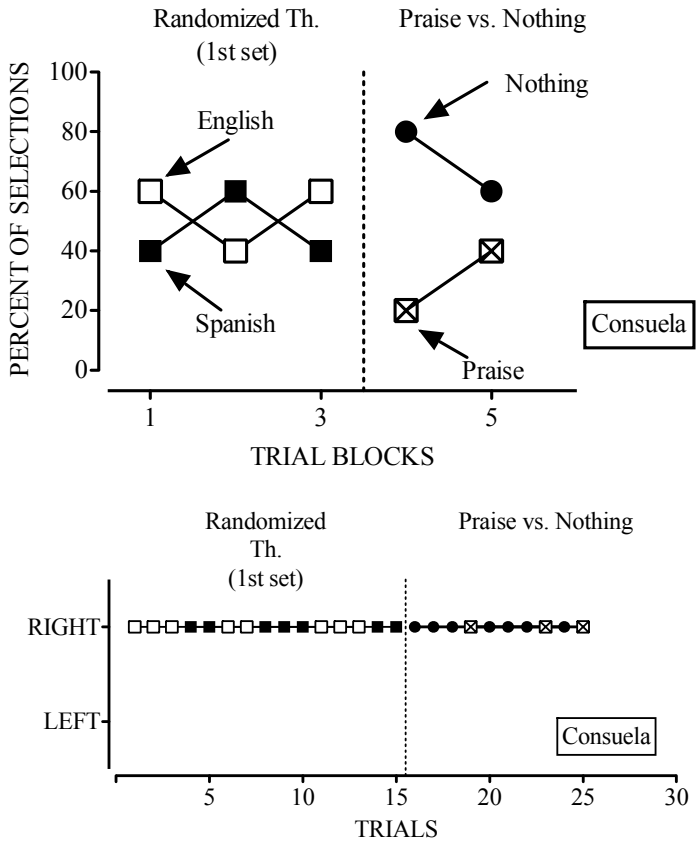

Figure 14. Results from Consuela's paired stimulus preference assessment. We saw responding only occurring to the stimulus on the right. This bias persisted even when delivery of praise was compared to delivery of nothing. These results provide clear evidence that Consuela's behavior was not sensitive to social consequences. Therefore, Consuela was excluded from further participation in the study.

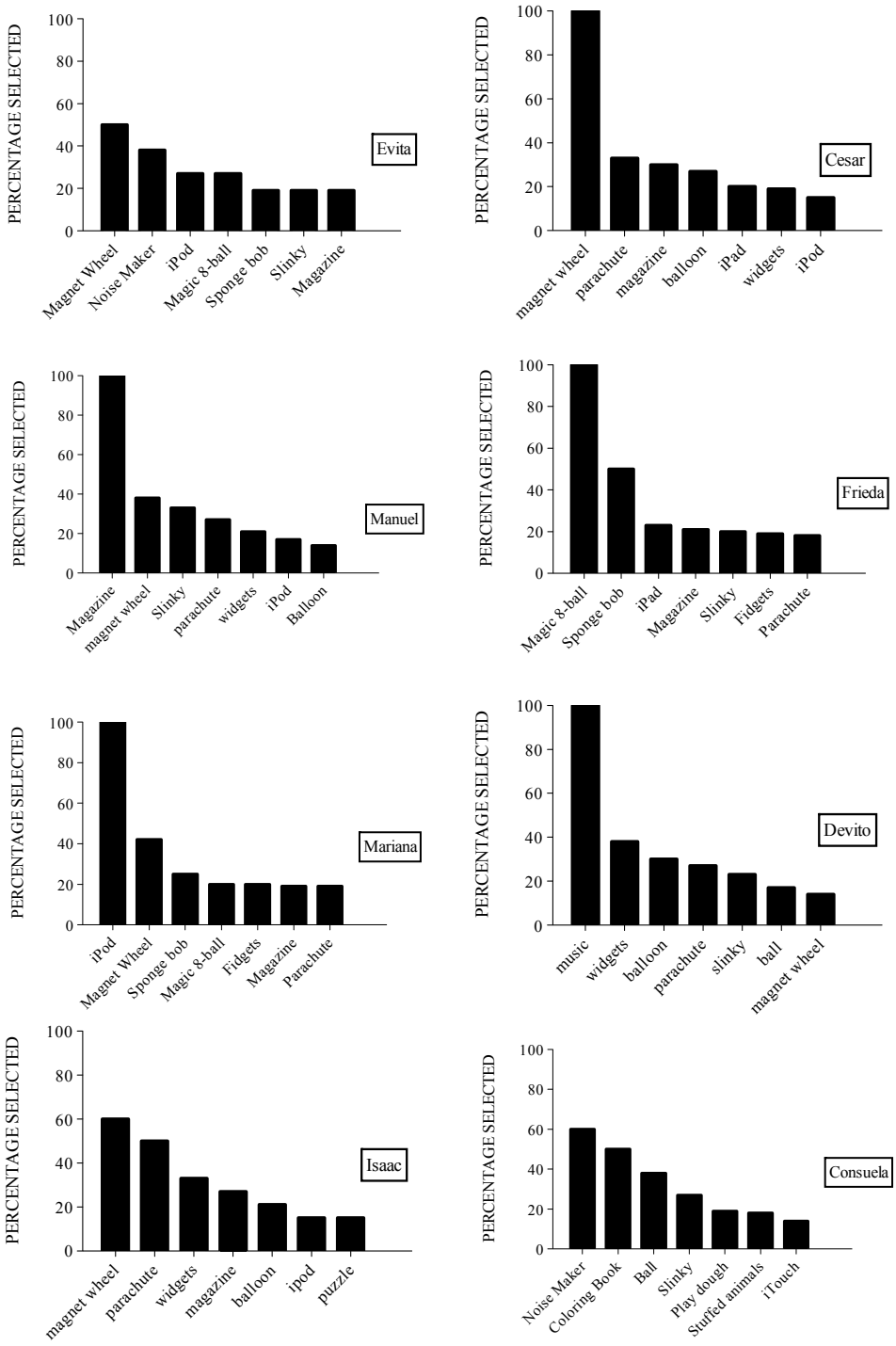

Figure 15. Results for the MSWO preference assessments for all participants. A highly preferred toy was identified for all participants to be used in the choice training.

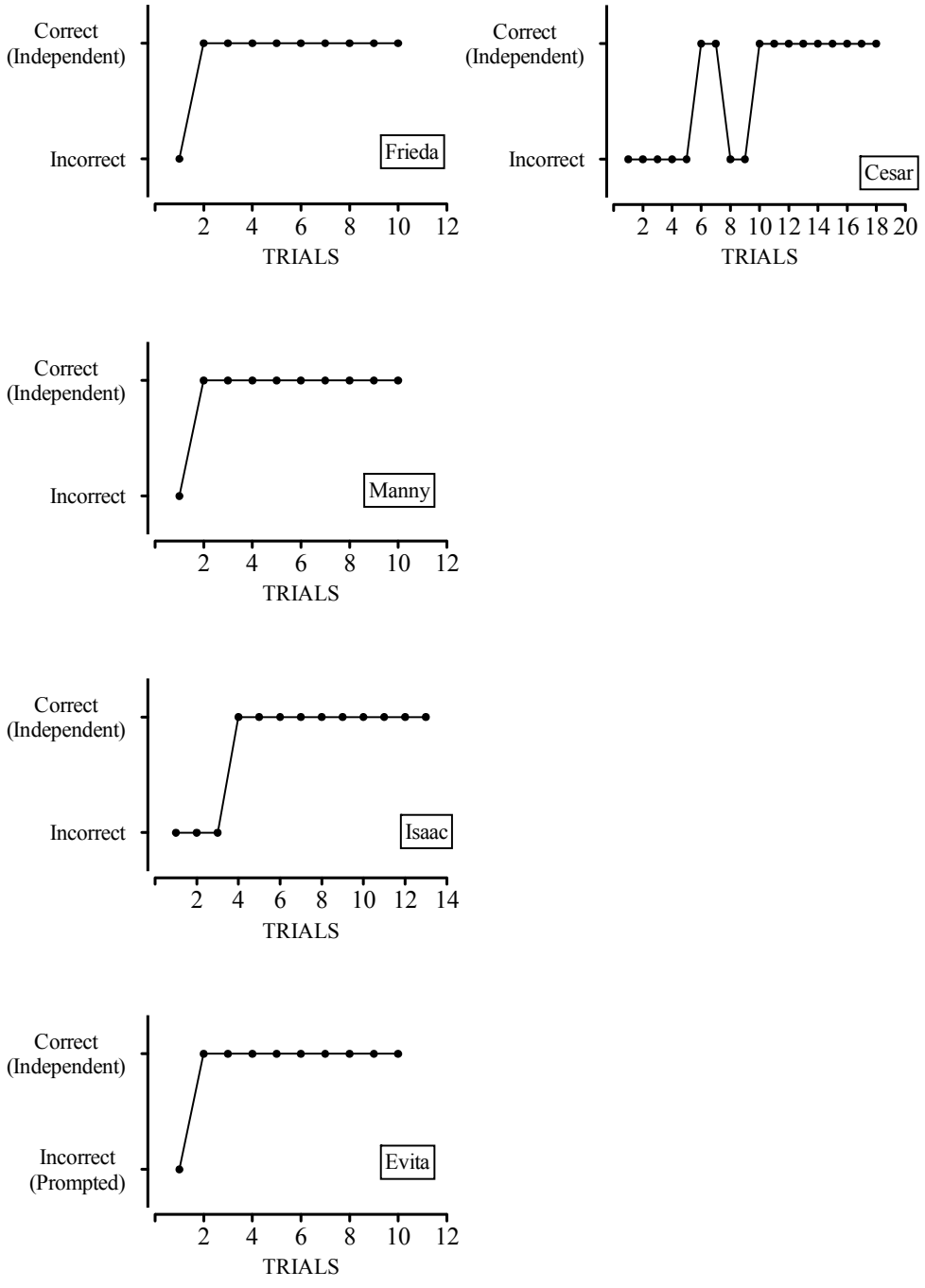

Figure 16. Results from the choice-making training for the five participants included in the study. All participants met the criteria of 90 % correct (independent) responding.

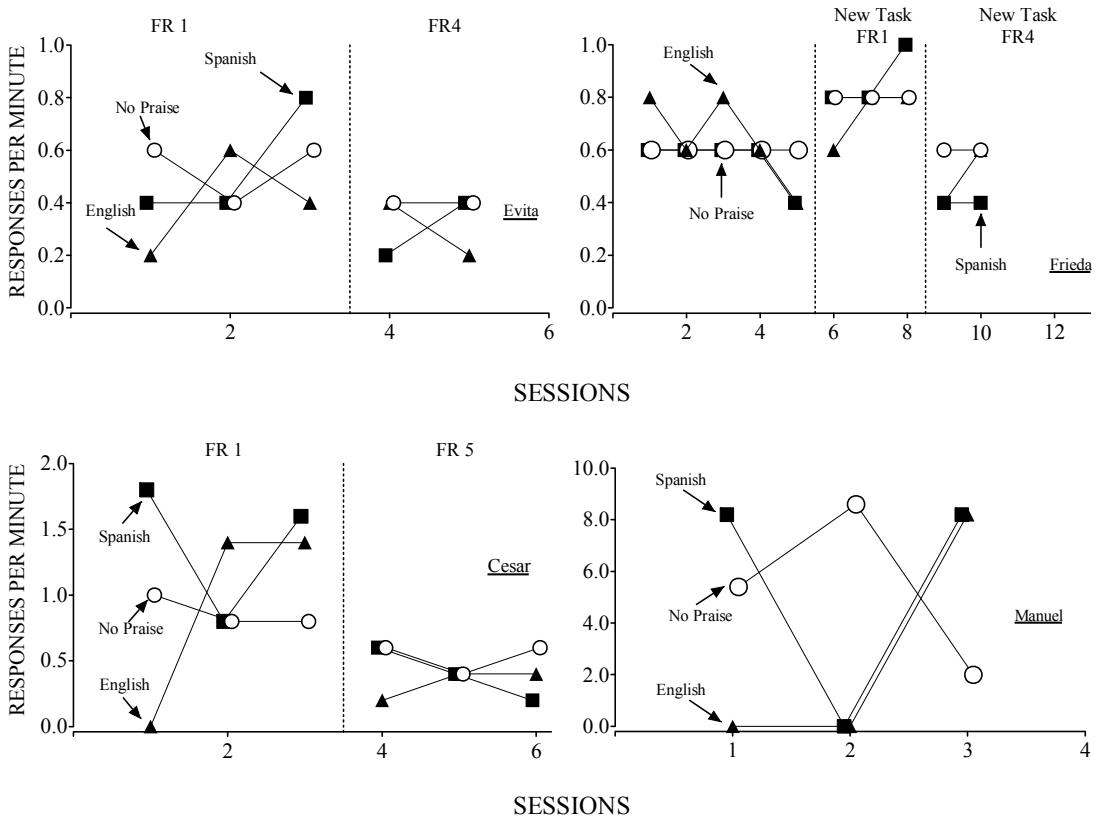

Figure 17. Preliminary results for all participants from the reinforcer assessment using academic task. Response patterns were similar for all participants. There were undifferentiated response patterns across all conditions including the control. These patterns persisted even when manipulations of increasing the response requirement (Cesar, Evita, Frieda) and when new academic tasks were introduced (Frieda). This suggested that something other than the consequences provided for task completion was controlling responding. This may have been because the school context exerted stimulus control over academic responses due to a long history of reinforcement for compliance with academic tasks in the school setting. Therefore, academic tasks were replaced with arbitrary tasks (without a history) for all participants.

Appendix C

Script

(English therapist will use English translation and Spanish therapist will use Spanish translation)

1. “Hi, my name is _____. I speak English/Spanish.”

2. “What is your name?” (Participant says name)

3. “Nice to meet you, _____.”

4. “I like your (color) shirt.”

5. “Can you tell me something you see in the room?”

6. “Nice job!” (This praise statement will be consistent)

1. “Hola, mi nombre es _____ o Me llamo_____. Hablo inglés/español.”

2. “Cuál es tu nombre?” o “Cómo te llamas?” (Participante dice el nombre)

3. “Encantado/a de conocerte, _____.”

4. “Me gusta tu camisa (color).”

5. “Puedes decirme algo que ves en el cuarto?”

6. “Buen trabajo” o “Muy bien hecho” (Esta afirmación de elogio será consistente)

CURRICULUM VITAE

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Education

2011–2015	Ph.D.	Utah State University Logan, UT	Disability Disciplines *Concentration*: Applied Behavior Analysis *Advisors:* Drs. Sarah Bloom and Timothy Slocum *Dissertation*: Assessing preference for language in English language learners with disabilities
2007–2010	M.S.	Northeastern University Boston, MA	Applied Behavior Analysis *Advisor*: Dr. Jason Bourret *Thesis:* An analysis of the effects of reinforcers arranged in choice contexts
2003–2007	B.S.	Utah State University Logan, UT	Psychology *Minor*: Human Resource Management

Professional Organizations and Honors

2013–present	Four Corners Association for Behavior Analysis
2011–present	Utah Association for Behavior Analysis
2010–present	Association of Professional Behavior Analysts
2004–present	Association for Behavior Analysis International
2007–2013	Berkshire Association for Behavior Analysis and Therapy
2003–2007	Dean's Scholarship Recipient–Utah State University

Certification

2010–present Board Certified Behavior Analyst, #1-10-7376

Editorial Activities

2015 Guest reviewer–*Journal of Applied Behavior Analysis*
2014 Guest reviewer–*Journal of Applied Behavior Analysis*
2013 Guest reviewer–*Journal of Positive Behavior Interventions*
2010 Guest reviewer–*Journal of Applied Behavior Analysis*

Publications

Lambert, J. M., Bloom, S. E., **Clay, C. J**., Kunnavatana, S. S., & Collins, S. D. (2014). Training residential staff and supervisors to conduct traditional functional analyses. *Research in Developmental Disabilities, 35,* 1757-1765.

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B. K., & Boyle, M. A. (2013). Assessing preference for social interactions. *Research in Developmental Disabilities, 34*, 362-371.

Lambert, J. M., Bloom, S. E., Kunnavatana, S. S., Collins, S. D., & **Clay, C. J.** (2013). Training residential staff and supervisors to conduct trial-based functional analyses. *Journal of Applied Behavior Analysis, 46*, 296-300.

Potter, J. N., Hanley, G. P., Augustine, M., **Clay, C. J**., & Phelps, M. C. (2013). Treating stereotypy in adolescents diagnosed with autism by refining the tactic of "Using stereotypy as reinforcement." *Journal of Applied Behavior Analysis, 46*, 407–423. doi:10.1002/jaba.52

Tschanz, J. T., Cook, L., Corcoran, C., Norton, M., Mielke, M., Rosenberg P., Buckley, T., **Clay, C. J.,** Welsh-Bohmer, K., Breitner, J., & Lyketsos, C. (2006). Vascular factors and the Rate of Cognitive Decline in Dementia. The Cache County Study. *Alzheimer's & Dementia (supplement) 2(3*), S270.

Manuscripts under Review

Clark, D., Bloom, S. E., Boyle, M. A., & **Clay, C. J.** (under review). Effects of delaying demands on escape-maintained problem behavior. *Journal of Applied Behavior Analysis.*

Lambert, J. M., Bloom, S. E., Nickerson, C., **Clay, C. J.,** & Samaha, A. L. Human sensitivity to manipulations of parameters of positive and negative reinforcement.

Manuscripts in Preparation

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B. K. Assessing preference for types and arrangements of social interaction in children with autism.

Clay, C. J., & Bourret, J. C. An analysis of the effects of reinforcers arranged in choice contexts.

Sellers, T. P., **Clay, C. J.,** Hoffman, A., & Collins, S. D. Effects of trial-based functional analysis training, goal setting, incentives, and coaching on behavior clinician completion of functional assessments.

Hoffman, A., **Clay, C. J.**, Contreras, B., Twohig, M. P. A guide to using acceptance and commitment therapy with individuals with disabilities

Meaker, T. M., Bloom, S. E., **Clay, C. J.,** & Weese, H. T. Correspondence between teacher-conducted trial-based functional analyses and traditional functional analyses with high-school aged students.

Vanselow, N. R., Bourret, J. C., & **Clay, C. J.** Describing naturally occurring schedules: Analysis of feedback functions for shooting during basketball games.

Conference Presentations

Lambert, J.M., Bloom, S.E., Nickerson, C., **Clay, C.J.,** & Samaha, A.L. (2015 June). *Sensitivity of human choice to manipulations of parameters of positive and negative sound reinforcement.* Presented at the Tennessee Association for Behavior Analysis Middle Tennessee Regional Meeting.

Lambert, J. M., Bloom, S. E., Nickerson, N. M., **Clay, C. J.,** & Samaha, A. L. (2014, May). *Sensitivity of human choice to manipulations of parameters of positive and negative reinforcement,* In J. Lambert, Chair, Current Issues in Negative Reinforcement and Applied Behavior Analysis. Symposium presented at the 40th annual convention of the Association for Behavior Analysis International, Chicago, IL.

Clark, D., Bloom, S. E., Boyle, M. A., & **Clay, C. J.** (2014, May). *Effects of delaying demands on escape-maintained problem behavior.* In J. Lambert, Chair, Current Issues in Negative Reinforcement and Applied Behavior Analysis. Symposium presented at the 40th annual convention of the Association for Behavior Analysis International, Chicago, IL.

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B., & Boyle, M. A. (2013). *Assessing preference for social interactions*. Symposium presented at the 39th annual Association for Behavior Analysts International, Minneapolis, MN.

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B., & Boyle, M. A. (2013). *Assessing preference for social interactions.* Symposium presented at the 3rd annual Association of Professional Behavior Analysts, Las Vegas, NV.

Lambert, J. M., Bloom, S. E., Kunnavatana, S. S., Collins, S. D., & **Clay, C. J.** (2012, June). *Transitioning to functional analyses: An organization-wide training.* In S. Bloom, Chair, Applying Behavior Analysis to Educational and Human Service Settings. Symposium presented at the 3rd annual meeting of the Utah Association for Behavior Analysis and Utah Conference on Effective Practices for Teachers and Human Service Professionals: Interventions Across the Lifespan, Logan, UT.

Bloom, S. E., Kunnavatana, S. S., Samaha, A. L., & **Clay, C. J.** (2012, June). *Trial-based FA: What it is and how to do it.* Talk presented at the 3rd annual meeting of the Utah Association for Behavior Analysis and Utah Conference on Effective Practices for Teachers and Human Service Professionals: Interventions Across the Lifespan, Logan, UT.

Lambert, J. M., Bloom, S. E., Kunnavatana, S. S., Collins, S. D., & **Clay, C. J.** (2012, May). *Transitioning to functional analyses: An organization-wide training.* In S. Collins, Chair, Staff Training in Community Residential Settings. Symposium presented at 38th annual meeting of the Association for Behavior Analysis International, Seattle, WA.

Bloom, S. E. & Kunnavatana, S. S., Samaha, A. L., & **Clay, C. J.** (2012, February). *Trial-based functional analysis: What it is and how to do it.* Workshop presented at 30th Annual Western Regional Conference on Behavior Analysis, Garden Grove, CA.

Augustine, M. K., Bourret, J. C., & **Clay, C. J.** (2010). *Analysis of the effects of psychotropic medication on the behavior of children diagnosed with autism*. Symposium presented at 36th annual meeting of the Association of Behavior Analysis International, San Antonio, TX.

Vanselow, N. R., Bourret, J. C., & **Clay, C. J.** (2010). *Describing naturally occurring schedules: Analysis of feedback functions for shooting during basketball games*. Symposium presented at 36th annual meeting of the Association of Behavior Analysis International, San Antonio, TX.

Trainings and Presentations (invited)

Clay, C. J., Sellers, T. P., & Hoffmann A. *Conducting trial-based functional analyses in community settings*. Invited training presentation for Chrysalis, Inc., Cedar City, UT. October 2014.

Bloom, S. E., Samaha, A. L., Kunnavatana, S. S., Lambert, J. M., & **Clay, C. J.** *Approaches to Functional Behavior Assessment including trial-based FA*. Invited training presentation at the Utah Personnel Development Center, Salt Lake City, UT. December 2011.

Bloom, S. E., Kunnavatana, S. S., Samaha, A. L., & **Clay, C. J.** *Trial-based FA: What it is and how to do it.* Talk presented at the 3rd annual meeting of the Utah Association for Behavior Analysis and Utah Conference on Effective Practices for Teachers and Human Service Professionals: Interventions Across the Lifespan, Logan, UT. June, 2012.

Lambert, J. M., Bloom, S. E., **Clay, C. J**., Kunnavatana, S. S., & Collins, S. D. *Training residential staff and supervisors to conduct traditional and trial-based functional analyses*. Invited training presentation for Chrysalis, Inc., Salt Lake City, UT. October 2012.

Poster Presentations

Clay, C.J., Bloom, S.E., Slocum, T. A., Samaha, A.L., Callard, C.H. (2015, June) Assessing preference for home language or english praise in english language learners with disabilities. Poster presented at Utah Multi-Tiered Support Services Conference, Layton, UT.

Meaker, T. M., Bloom, S. E., **Clay, C. J.,** & Weese, H. T. (2014, June). Correspondence between teacher-conducted trial-based functional analyses and traditional functional analyses with high-school aged students. Poster presented at the 4th annual meeting of the Utah Association for Behavior Analysis and Utah Multi-Tiered Support Services, Layton, UT.

Meaker, T. M., Bloom, S. E., **Clay, C. J.,** & Weese, H. T. (2014, May). Correspondence between teacher-conducted trial-based functional analyses and traditional functional analyses with high-school aged students. Poster presented at the 40th annual convention of the Association of Behavior Analysis International, Chicago, IL.

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B., & Boyle, M. A. (2013). Assessing preference for social interactions. Poster presented at the 4th annual meeting of the Utah Association for Behavior Analysis and Utah Conference on Effective

Practices for Teachers and Human Service Professionals: Interventions Across the Lifespan, Logan, UT.

Clay, C. J., Samaha, A. L., Bloom, S. E., Bogoev, B., & Boyle, M. A. (2012). Assessing preference for social interactions. Poster presented at the 33rd annual Berkshire Association for Behavioral Analysis and Therapy Conference, Amherst, MA**.**

Clay, C. J., Potter, J. N., Hanley, G. P., Augustine, T., & Phelps, M.C. (2012). Increasing the amount and complexity of play in an adolescent with an ASD by using access to motor stereotypy as a reinforcer. Poster presented at Utah Conference on Effective Practices For Teachers and Human Service Professionals: Interventions Across the Lifespan, Logan, UT.

Potter, J. N., Hanley, G. P., Augustine, M., & **Clay, C. J.** (2012). Identifying client preference for and other stakeholder acceptability of treatments to decrease stereotypy. Presented at the 1st annual Association of Professional Behavior Analysts Conference, Boston, MA.

Clay, C. J., & Bourret, J. C. (2010). An analysis of the effects of the reinforcers arranged in choice contexts. Poster presented at 36th annual meeting of the Association of Behavior Analysis International, San Antonio, TX.

Clay, C. J., & Bourret, J. C. (2010). An analysis of the effects of the reinforcers arranged in choice contexts. Poster presented at the 31st annual Berkshire Association for Behavior Analysis and Therapy, Amherst, MA.

External Awards–Funded

Principal Investigator
"Assessing preference for language in English language learners with disabilities"
Utah Multi-Tiered Systems Support Student Grant
Total Costs: $1,000
September 2014–May 2015

Professional Experience

Supervision of Prospective Behavior Analysts seeking BCBA

2012–present Practicum Supervisor, Special Education Master's Program, Utah State University, Logan, UT

2011–present	Graduate Student Supervisor (Severe Behavior Clinic), Utah State University, Logan, UT
2011–present	Undergraduate Student Supervisor (Research & Severe Behavior Clinic), Utah State University, Logan, UT

Teaching

Spring 2014:	Instructor, Department of Special Education and Rehabilitation, Utah State University SPED 5050–Applied Behavior Analysis 2: Applications
Spring 2013:	Teaching Assistant, Department of Special Education and Rehabilitation, Utah State University SPED 5050–Applied Behavior Analysis 2: Applications
Spring 2013:	Teaching Assistant, Department of Psychology, Utah State University PSY 4720–Behavioral Assessment and Intervention II

Clinical

2011–present	Utah State University Severe Behavior Clinic. Logan, UT Lead Therapist. Supervisors: Sarah Bloom, Ph. D., BCBA-D; Andrew Samaha, Ph.D., BCBA-D; Tyra Sellers, Ph.D., BCBA-D
2011–present	Chrysalis. Salt Lake City, UT Behavioral Consultant. Clinical Trainer. Supervisor: Shawnee Collins, Ph.D., BCBA-D
2007–2011	The New England Center for Children. Southborough, MA Residential Coordinator. (2009–2011) Level II Teacher/Medication emphasis. (2007–2009) Supervisor: Stacie Bancroft, Ph.D., BCBA-D
2005–2007	ASSERT (Autism Support Services, Education, Research, and Training). Logan, UT Behavioral Instructor.

Supervisors**:** Thomas Higbee, Ph.D., BCBA-D; Alison Betz, Ph.D., BCBA-D

Community Service

2013–2015	Behavior Program Reviewer, Cache Education and Training Center, Logan, UT
2012–2015	Human Rights Committee Member, North Eastern Services, Logan UT