VERBAL BEHAVIOR ANALYSIS ON PRONOUN USE BY A CHILD WITH AUTISM

By

Albee Therese Santillan Ongsuco

November 2010

Chair: Jeannie Golden, Ph.D.

Major Department: Psychology

There are limited studies that outline prompt-based methods in teaching pronouns to children with autism. The Verbal Behavior Analysis (VBA) approach is a good fit for teaching pronouns because of its emphasis on the acquisition and correct usage of verbal operants used in social exchanges. This study investigated the effects of a VBA-based multicomponent package treatment (i.e., contingent reinforcement and textual and echoic prompts) on correct pronoun use by a child with autism using a multiple baseline across four stimulus sets design. The results demonstrated that the child's responses among four stimulus sets were variable, indicating the lack of confidence in effectiveness of the intervention. Evidence of the reliability of the dependent and independent variables was not demonstrated, and made conclusions very limited. However, the intervention possesses face and social validity, in light of social cognition problems faced by children with autism. Replication with adequate internal controls is suggested for future research.

Verbal Behavior Analysis on Pronoun Use by a Child with Autism

A Master's Thesis

Presented To

The Faculty of the Department of Psychology

East Carolina University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in School Psychology

By

Albee Therese Santillan Ongsuco

November 2010

Verbal Behavior Analysis on Pronoun Use by a Child with Autism

By

Albee Therese Santillan Ongsuco

APPROVED BY:

CHAIR OF THESIS:

_____

DR. JEANNIE GOLDEN, PHD, BCBA

COMMITTEE MEMBER:

_____

DR. SCOTT METHE, PHD, NCSP

COMMITTEE MEMBER:

_____

DR. CHRISTY WALCOTT, PHD, NCSP

COMMITTEE MEMBER:

_____

DR. DENNIS RUSSO, PHD, ABBP

CHAIR OF THE DEPARTMENT PSYCHOLOGY:

_____

DR. KATHLEEN ROW, PHD

DEAN OF THE GRADUATE SCHOOL:

_____

DR. PAUL J. GEMPERLINE, PHD

ACKNOWLEDGEMENTS

Dr. Jeannie Golden

Thank you for your time and constant support throughout this project. Your support demonstrated itself in multiple and various ways. You coordinated and oversaw the project from conceptualization to completion: from contacting the behavioral consultant, to providing supervision during the practicum placement, to responding to treatment modifications. You responded quickly to countless emails, scheduled and attended numerous meetings, and provided helpful and positive guidance, even through the most challenging parts of this project.

I appreciate your commitment very much.

Shannon Brooks and Jessica Phipps

Thank you for your efforts in collecting teaching and probe data during baseline and intervention.   Your willingness to help in the project and feedback throughout the project demonstrated your dedication to the field of applied behavioral analysis.

Lori Stuart

Thank you for sharing your expertise in verbal behavior analysis and my inclusion in K.H.'s home-behavior therapy program.

K.H. and His Family

Thank you for K.H.'s participation this research project, for sharing your resources for reinforcement, and for your accommodation in your schedules of the time needed to complete the project.

Drs. Scott Methe, Christy Walcott, and Dennis Russo

Thank you for your areas of expertise in the ethics in the field of ABA, techniques and components of applied psychological research, and single-subject research design.

TABLE OF CONTENTS

LIST OF TABLES.

LIST OF FIGURES.

CHAPTER 1: INTRODUCTION

Autism is characterized by three main features: lack of social interaction, lack of communication, and repetitive or stereotyped behaviors (DSM-IV-TR, 2004). In addition, there are notable deficits in behavioral and cognitive functioning as well as associated behaviors, which makes autism a heterogeneous and multidimensional disorder (West, Waldrop, & Brunnsen, 2009). The development and use of language by children with autism is a primary area of concern (Sundberg & Partington, 1998). There have been numerous studies in recent years addressing the improvement of language deficits of children with autism through a variety of treatment programs (Matson & Smith, 2008). However, there has been only a handful of research evaluating the correct pronoun use of children with autism.

Pronoun reversal is often cited as a primary feature of individuals with autism (West, Waldrop, & Brunnsen, 2009; Pelios & Lund, 2001). Children with autism have substantial difficulty with this deictic ability, often calling others *I* and themselves *you* (Lee, Hobson, & Chiat, 1994). Proper use of pronouns is an essential feature of any language, as it denotes self-differentiation of the speaker from the addressee. This is known as personal deixis (Fay, 1979). More importantly, correctly recognizing and matching pronouns with their previous referents within a story has been demonstrated to increase reading comprehension (O'Conner & Klein, 2004). Children who can correctly use possessive pronouns were more likely to learn abstractions such as size/shape/color, to use multiple descriptors for items, to respond correctly to WH- questions, to answer questions about temporally-remote events, and to use two full sentences within a conversation (Krantz, Zalenski, Hall, Fenske, & McClannahan, 1981). Thus, correct pronoun use is a beneficial functional skill to possess in academic and social situations.

There are several perspectives which provide explanations for the pronoun difficulty often observed in children with autism. The psychodynamic perspective asserts that the child with autism is denying his existence in the world and therefore, will avoid using *I* in his speech (Bartak & Rutter, 1974). In contrast, the theory of mind perspective explains the inappropriate use of pronouns as the child's inability to develop a concept of self as well as a concept of other selves (Fay, 1979). Essentially, the correct use of personal pronouns reflects a "developmental convergence of speech, language, cognition, and communication" (Fay, 1979, p. 249) that is deficient in children with autism.

To address the issues of pronoun difficulty for children with autism, the linguistic perspective posits that children with autism have a lower capacity of echoic memory than a typically developing child. Thus, they find it more difficult to remember and use pronouns at the beginning or medial positions of phrases than those at the ends of the sentences (Bartak & Rutter, 1974). The linguistic deixis should develop after the teaching of a behavioral deixis (i.e., tracking, pointing, gesturing, and eye contact); however, this sequence is often reversed (Fay, 1979).

The behavioral perspective advocates the use of a behavioral deixis (e.g., gestures) to develop joint attention between the child with autism and another person. This is the beginning of fostering understanding the difference between speaker and addressee. In terms of correct word usage, when children who echoed were reinforced for using appropriate responses instead of echoing, their echolalia stopped (Carr, Schreibman, & Lovaas, 1975).

The psychodynamic perspective has been disputed in the literature (Bartak & Rutter, 1974), and the linguistic and behavioral perspectives have been supported by empirical evidence (Fay, 1979; Bartak & Rutter, 1974; Carr et al., 1975). However, to date, there has been a lack of

systematic investigation of actual instructional techniques specifically targeting correct pronoun use by children with autism. To this end, a verbal behavior analysis approach is explored.

First, a brief explanation and history of verbal behavior as well as its inclusion in different treatment programs is required. With specific interest in analyzing the different functions of language, B.F. Skinner (1957) introduced principles of verbal behavior. Greer and Ross (2008) define verbal behavior as "behavior whose reinforcement is mediated by another person" (p. 2). In order for a listener to respond to a speaker, Skinner (1957) proposed that children need to learn (a) to vocally mimic others (echoics), (b) to ask for what they want (mands), (c) to label items in their environment (tacts), (d) to be involved in a conversation (intraverbals), (e) to specify features of desired items (autoclitics), and (f) to use printed words in exchanges (textual responding). Applied Behavioral Analysis (ABA), in addition to its other important applications (e.g., functional assessment, behavioral intervention, etc.), provides a basis for expanding the verbal repertoires of children with autism along with improving other associated behaviors (e.g., self-injurious behaviors, noncompliance, nonresponsiveness, etc.). ABA is a treatment methodology based on principles of operant conditioning by B.F. Skinner (1953). One of the best known extensions of ABA is the Early Intensive Behavioral Intervention (EIBI) approach, popularized by O. Ivar Lovaas (Eldevik, Hastings, Hughes, Jahr, Eikeseth, & Cross, 2009). However, in recent years, ABA has seen an evolution in the use of its basic principles with the emergence of a new subfield.

Verbal Behavior Analysis (VBA) extracts principles from verbal behavior and applied behavioral analysis, including finding individualized interventions, conducting functional assessments, and forming and testing hypotheses about the function of target behaviors before and during interventions. It demonstrates the evolution of traditional ABA in that it analyzes

what verbal capabilities or verbal developmental milestones (i.e., verbal prerequisites needed to access the next verbal unit) the child is missing (Greer & Ross, 2008). According to Greer and Ross (2008), VBA extends the field because it provides teaching interventions to "establish functional verbal repertoires when they are missing" (p.3).

Interventions are provided to supplement the current verbal repertoires of children with autism, and research has demonstrated the effectiveness of teaching children with autism units of verbal behavior such as mands, tacts, textual exchanges, peer initiations, and intraverbals (Sundberg & Michael, 2001; Kranz & McClannahan, 1993). As noted above, several empirical studies have investigated the patterns of correct pronoun use in both children with a variety of mental health diagnoses, including autism, and typically developing children (Bartak & Rutter, 1974; Silberg, 1978; Loveland & Landry, 1986; Lee, Hobson, & Chiat, 1994). However, there have not been any studies investigating the effectiveness of using a VBA approach in teaching children with autism to correctly use pronouns (Finkel & Williams, 2001). In fact, several features are missing in the literature investigating pronoun use by children with autism and they include a] an emphasis on verbal behavior, b] a research design that experimentally evaluates progress, and c] a specific teaching method to target pronoun use.

The purpose of this study was to demonstrate the effectiveness of a VBA approach in teaching a boy with autism to correctly use pronouns. A multicomponent verbal behavior method, consisting of textual prompts, echoic prompts, and contingent reinforcement procedures, was used to teach a six-year-old boy with autism with a fairly complex verbal repertoire, the correct use of pronouns within intraverbal exchanges. A multiple baseline across four sets design demonstrated the effect of the teaching method. Each set included the pronoun phrases: *It's mine, It's yours, It's his, and It's hers*. The timing of instruction of each stimulus set was

staggered. The intervention was implemented predominantly in the child's home and with

different therapists.

CHAPTER 2: LITERATURE REVIEW

Overview of Autism

Autism is a neurodevelopmental disorder typically diagnosed within three years of age (Pelios & Lund, 2007). It is often referred to as Autism Spectrum Disorder or Pervasive Developmental Disorder (West, Waldrop, & Brunssen, 2009). It is reported that 1 in every 150 children are diagnosed with autism annually (CDC, 2007), and prevalence rates have increased tenfold, from 5 to 8 children diagnosed per 10,000 births in 1992 to 50 to 80 children diagnosed per 10,000 births in 2002 (Blaxill, 2004).

Autism is described as a multidimensional developmental disorder, which is characterized by its unique combination of excesses and deficits. *Behavioral excesses* are behaviors in which the individual child engages at a higher level compared to typically developing peers. These include engagement in stereotypical behavior, self-stimulatory behavior, frequent preoccupation with parts of objects, overreliance on routines, and engagement in physical aggression and self-injurious behaviors (West, Waldrop, & Brunnsen, 2009). There are also *behavioral deficits* which are behaviors in which the individual child engages at a lower level than typically developing peers. These include a delay or absence in the development of language and social interaction, lack of appropriate play, reversal of pronouns, restricted interests, and inappropriate or lack of social interaction (West, Waldrop, & Brunnsen, 2009).

Why Pronouns are Difficult for Children with Autism

Embedded in this lack of social interaction is a deficit of a personal deixis. According to Fay (1979), a personal deixis is the awareness of self-differentiation between a speaker (e.g., *you*) and the addressee/listener (e.g., *me*). The reversal of pronouns has been indicated to be a primary language deficit for children with autism, which may due to their echolalia (Carr et

al.,1975). Children with autism have difficulties with remembering the words of the beginning of the sentence and are more likely to echo the ends of sentences. Since possessive pronouns are usually located in the beginning of sentences, children with autism usually do not use pronouns correctly. It has been observed that when children with autism are taught the targeted verbal skills, then the echolalia goes away (Carr et al., 1975) Thus, a lasting verbal repertoire is attainable if the intervention is successful.

To date, there are no studies investigating the effectiveness of a teaching method specifically for pronoun use in children with autism. However, there is literature which has purported several theories on the deficits of pronoun use by children with autism. Children with autism have significant difficulty with pronoun usage because of multiple social, cognitive, and grammatical causes (Fay, 1979). A psychodynamic approach was traditionally held to be the main explanation for this phenomenon. In this perspective, Bettelheim (1967, as cited in Fay, 1979; Bartak & Rutter, 1974) stated that children with autism "avoid" the use of personal pronouns, especially the use of the word *I*, because they deny their sense of self. For this reason, children with autism have significant difficulty with pronoun use because they cannot conceptualize their own identity through use of *I, me,* and *mine*.

In contrast, the linguistic perspective stated that the child with autism has an underlying deficit in her/his deictic ability. Bartak and Rutter (1974) proposed that children with autism do not deny their concept of self, and can readily remember and use the word *I*. However, their incorrect use of pronouns stemmed from inadequate memory. Due to the child's limited echoic memory, personal pronouns at the end positions of sentences were more likely to be remembered than pronouns at the middle or beginning of the phrase. However, once positions were controlled, children with autism readily used the word *I*. Essentially, this perspective ascertained

that the *You/I* distinction may originate from echolalia and delayed repetition of stereotyped phrases, instead of intrapsychic events (Bartak & Rutter, 1974; Carr et al., 1975).

To investigate the accuracy of the developmental perspective, Silberg (1978) conducted a study which found that as the child's egocentrism decreased, the percentage of possessive pronouns (e.g., *me, my, mine, I*) in his speech decreased, and the use of third person pronouns (e.g., *he* and *she*) increased. Essentially, this theory posited that children with autism were simply delayed in their use of pronouns compared to typically developing children. In some children with autism, the delay was so significant that the child did not use *I* at all.

A behavioral perspective advocated the use of gestures to develop joint attention skills between the child with autism and another person. The teaching of a behavioral deixis (i.e., tracking, pointing, gesturing, and eye contact) should precede linguistic deixis (Fay, 1979; Loveland & Landry, 1986). Essentially, this theory suggested that deficits in joint attention skills contributed to a problem in the development of language, thus affecting correct use of pronouns.

Methods used in Studies to Measure Correct Use of Pronouns in Children with Autism

Though the following studies provided only theoretical evidence on the patterns of pronoun use of children with autism, elements from each of their procedures are considered in the present study.

In a study by Silberg (1978), twenty-three participants, fourteen diagnosed as having autism, three diagnosed with schizophrenia, and six with nonspecified diagnoses, were interviewed during play sessions. The experimenters asked the children to respond to different types of statements which included possessive statements ("Whose are these?"), action statements ("What happened?") and description statements ("How are you different from me?").

The target behavior was the increase of the mean number of utterances within a social exchange. The children were ranked developmentally by their mean length of utterance (MLU) within three sets of statements. The sessions were recorded on a cassette tape player and were transcribed. A 4 (number of MLU levels) by 3 (number of pronouns) analysis of variance was conducted. The frequency and duration of the child's speech was recorded and then children were divided into two groups for statistical analysis in a between-group design. The frequency and type of pronoun error were noted for the Low MLU and High MLU groups. The purpose of the study was to determine the developmental progression from first, second, to third person pronouns in the spontaneous speech of psychotic children (including children with autism).

The measurement procedure was implemented by the experimenter. In the possession game, the experimenter, the child, and a puppet were given a chance to hide his own M&M's in the room. The child was then asked the following question: "whose are these?" and the child needed to respond with either: "mine" referring to the child, "yours" referring to the experimenter, or "his" referring to the puppet. In the second game, each participant took two turns with a plastic bowling set, and then the experimenter asked: "What happened?" The child's answer consisted of: "I got ten [pins]", "you knocked 'em", and "he got it down". In the third game, the child was told to draw a picture of himself, the experimenter, or another friend or family member. The experimenter then asked: "how are you different from me?", "how is your friend different from you?", and "how am I different from your friend?"

Results indicated that children in the low MLU groups were more likely to engage in "psychotic" characteristics. They demonstrated more perseverations in their speech, more echolalia ($n = 5$), more use of their own names in a social exchange ($n = 4$), more use of neutral pronouns such as *it* and *that* ($n = 4$), and more pronoun reversals than children ($n = 5$) at the high

MLU levels (n = 1, 3, 0, 0, respectively). Notably, no children used the pronoun *he* more than

the use of *I*. The authors concluded that there is a developmental progression in using pronouns

which supports the developmental perspective because echolalia occurs at an earlier stage of

language development. Possession is the earliest context in which pronouns are used correctly,

followed by the action phase, and then the description phase (Silberg, 1978).

Bartak and Rutter (1974) utilized another method to assess pronoun use in 8 children

diagnosed with autism within a structured play setting. The target behavior was the child's

repetition of the pronoun after the experimenter said a phrase. The child would receive a point

for every instance he repeated the pronoun. A frequency count of the scores was the dependent

variable and the data were analyzed statistically using a treatments x treatments x participants

analysis of variance.

The purpose of the study was to determine if sentence position of pronouns affected

spontaneous echoing of personal pronouns in children with autism. Each child was presented

with 90 sentences over three sessions. These sentences were 3-word sentences which contained

one pronoun and two other words. *I, you, he, she*, and *me* were all utilized in the first, middle, or

last position of the phrase. The experimenter said each sentence during the play session and the

entire exchange was taped.

Results suggested that children with autism were more likely to echo pronouns in the 3rd

or final position of the sentence (M = 29.1) than pronouns in the first position (M = 15.9) or

medial position (M = 17.0). The authors concluded that children can respond to echolalic

repetition of words in the final positions of sentences and others can echo the entire phrase.

Thus, children are limited by their use of echoic memory and, therefore, engage in pronoun

reversal and echolalia.

Another study by Lee, Hobson, and Chiat (1994) examined the differences in comprehension between 25 children with autism and 25 nonautistic children with cognitive deficits in their use of *I, you, and me* pronouns. The groups were matched in chronological age and verbal mental age based on the British Picture Vocabulary Scale. The study was conducted in a school setting by an experimenter. A between-groups design was utilized to study differences between children with upper ability and children with lower ability. The purpose of the study was to provide a systematic investigation of the presence or absence of abnormal patterns of pronouns between children with autism and matched controls.

The measurement method was implemented by the experimenter and consisted of three experiments. In each experiment the children were observed in their spontaneous production of personal pronouns and tested on their comprehension of personal pronouns. In the first experiment, the child and experimenter sat across from each other at a table. The experimenter displayed a two-sided piece of paper with two different pictures. During the measurement of production of pronouns, the experimenter asked the question, "Who sees the teddy bear?", and the participant responds with either a proper name or *me/you*. During the comprehension phase, the experimenter asked the child, "what can I see/what can you see?"

In the second experiment, paired photographs of the experimenter, the child and two of the child's classmates, were presented to the child by the experimenter. During the production phase, the experimenter asks the child, "who is this a picture of?" During the comprehension stage, the experimenter asked, "point to the picture of…"

The third experiment explored how the children would use personal pronouns if shown photographs. The materials were facial pictures of the child, the experimenter, and six of the child's classmates. During the production phase, the experimenter asked, "who is wearing the

hat/who is wearing the scarf?" During the comprehension stage, the experimenter asked, "what are you wearing/what am I wearing/what is _____ wearing?"

Results indicated that children with autism in the lower ability group were more likely to use proper names than *me* (*n* = 9) than children with autism in the high ability group (*n* = 4) and nonautistic children in the high ability group (*n* = 7). In addition, participants with autism were able to produce and comprehend *I, me,* and *you* and pronoun reversals were rare. However, there was lack of expression when using *me* and *you* in children with autism, regardless of ability.

The authors concluded that pronoun abnormalities in children with autism might be reflected in unusual patterns of usage rather than in incorrect use. In addition, ability to use pronouns was not lacking, but there was a propensity to use specific forms of expression in particular circumstances.

To provide evidence for the behavioral perspective, Loveland and Landry (1986) examined 11 children diagnosed as developmentally language-delayed (DLD) and 11 children diagnosed with autism in a playroom stocked with toys. The two groups of children were observed for the appropriate behaviors during pronoun, gesture-only, language-plus-gesture, and mixed mode or requesting situation tasks. The measurement technique utilized videotapes to code the number of correct, incorrect, or no responses. This data were then transformed to percent correct responses. In addition, the number of different types of joint attention behaviors, the number of spontaneous initiations of interaction, and the number of different joint attention behaviors in the requesting situation task were recorded. The between-subjects design distinguished the behaviors between the two groups. Investigators were trained to code the videotapes until they reached 90% interobserver reliability.

The purpose of the study was to investigate the differences in joint attention skills in children with DLD and children with autism to test the hypothesis that children with autism have a unique deficit in joint attention behaviors even when language is present.

In the pronoun task, the child was asked questions by an experimenter to determine his comprehension and use of the pronouns *I/you, my/your, and mine/yours*. In the gesture-only task, the child was observed to look at or comment on an item when the investigator shifted his gaze, pointed, showed the object, tapped the object, or moved that child's hand to the object. In the language-plus-gesture task, the child was observed to comprehend questions which were presented vocally and with one of the nonverbal prompts in the gesture-only task. The Requesting Situation task was made to elicit the child's initiation of an interaction. For example, the child could request for food when he/she sees the experimenter eating food conspicuously, to open a box with a desirable item inside, operate a noisy toy, blow bubbles, or provide a missing part of a toy.

Children with DLD were more likely to produce correct responses and comprehend the tasks in the language-only ($M = 60.82$), gesture-only ($M = 92.49$), language-plus-gesture ($M = 90.85$), and point in the Requesting Situation ($M = 16.37$) than children with autism ($M = 39.95$, $M = 81.49$, $M = 71.30$, $M = 0.63$, respectively). The authors concluded that children with autism have difficulty with language because of a developmental impairment of joint attention skills.

Another study by Jordan (1989) focused on the joint attention skills of children with autism before the development of a personal deixis, as compared with normally developing children and children with mental handicaps. There were 11 children in each comparison group and the experimental procedures were conducted in a laboratory setting.

The target behavior was the production of errors when asked to perform an action and then to answer a question. These two procedures differentiated between speaker and listener. Errors in the production or comprehension of *you/me* are defined as the child's use of any words, except for the target responses of *you* or *me*. The children's number of errors was measured through a frequency count during direct observation. The purpose of the study was to investigate the types of errors made by children with autism in the use of the personal pronouns, *you* and *me,* from a listener's perspective and a speaker's perspective.

With regard to the listener's perspective, participants were asked to complete actions with two requests, one using *you* and one using *me.* For example, the experimenter asked the participant to "sit the doll on *you*", and then asked the participant to "sit the doll on *me*". There were 10 instructions for each pronoun. The instructions were presented in random order and were consistent between participants. This condition tested the participant's comprehension of pronouns, and correct responses included the correct action with respect to the pronoun.

The speaker's perspective assessed the participant's production of pronouns. The experimenter manipulated objects in relation to herself or to the child attempting to elicit the correct pronoun. For example, after taking a hat on the table and putting it on herself, the experimenter asked the participant, "who's got the hat?" She then put the hat down on the table and put it on the participant, and asked the participant, "who's got the hat?" The experimenter had 10 planned attempts of elicitation, which were repeated in a random order for each participant. Correct responses included pronoun use from the participant's (the speaker's) perspective.

Results indicated that children with autism were more likely to produce more comprehension errors (9 participants made 15 to 20 errors) in the listener's perspective compared

to mentally handicapped (10 participants made 0-5 errors) and normally developing peers (11 participants made 0-5 errors). Incorrect responses included completing actions which referenced themselves instead of the speaker (e.g., putting the doll on the experimenter when asked by the experimenter to "sit the doll on you"). In terms of the production errors in the speaker's perspective, children with autism were less likely to emit the correct response of *you,* as compared with their peers. Children with autism were more likely to use the experimenter's name, *I*, and their own name, instead of using *you.* Similarly, children with autism were less likely to emit the correct response of *me,* as compared with their peers. Children with autism were more likely to use *I*, and their own name instead of using the target response of *me.*

The authors concluded that children with autism were more likely to use proper names or incorrect pronouns in response to experimental instructions and elicitations. The use of proper names confirmed that children with autism can differentiate between speaker and listener. However, their lack of social cognition, as compared to children with mental handicaps, suggested that children with autism have significant difficulty in shifting from use of proper names to the use of personal pronouns.

This summary of the studies focusing on the patterns of incorrect pronoun use by children with autism demonstrated the need for specific teaching methods. The evidence suggested that children with autism can differentiate the structure between pronouns such as *I, you,* and *me*, but instead refer to themselves and the experimenter by name. Thus, children with autism have difficulty utilizing personal pronouns appropriately. According to O'Conner and Klein (2004), mastery of pronouns has been determined to increase children's reading comprehension because children need to learn to match a referent with a preceding proper noun (e.g., *Troy* made a basket. *He* scored 1 point). More importantly, correct pronoun use has been linked to more

complex language. Children with autism who have mastered pronoun use were more likely to use WH- questions, use WH- questions appropriately, use descriptor words, and use complete sentences (Krantz, Zalenski, Hall, Fenske, & McClannahan, 1981). As such, deficits in pronoun use require a mode of treatment which targets the *function* of language, not necessarily its structure.

Verbal Behavior

B. F. Skinner (1957) defined verbal behavior as behavior that is reinforced through the mediation of another person's behavior, and therefore, differentiates it from nonverbal responding. Any response form (e.g., pointing, grunting, speaking, picture exchange, sign language, etc.) that is altered and is strengthened through consequences provided by another person, constitutes verbal behavior. The units of analysis in verbal behavior differ from a traditional or structure-based language perspective. Instead of providing names for the structure or position of words (e.g., subject, noun, adjective, verb), Skinner emphasized a switch to the function of the words. The units of analysis in verbal behavior: mand, tact, intraverbal, echoic, reflect a functional relation between the speaker and listener (Sundberg & Michael, 2001). See Table 1 for definitions of the aforementioned terms.

One characteristic of verbal behavior is its demonstration that there are changes in the controlling variables which differentiate one verbal operant from the other. Essentially, because of their different controlling variables, verbal operants are functionally independent of one another. For example, the child's utterance of the word "cookie" can be used as a tact to label a present stimulus (e.g., saying "cookie" when seeing a cookie on the table). The child can also use the same word as a mand and demonstrate his desire for the absent stimulus (e.g., saying "cookie!" when hungry and there is no cookie in sight). Thus, there are two different functional

uses of the single word, "cookie", though it is structurally considered a noun. Verbal behavior recognizes that this difference reflects the use of stimulus control transfer procedures that are necessary to teach the multiple "meanings" of the same response units.

Another characteristic of verbal behavior is its primary objective to teach children the distinction between the behavior of the speaker and the behavior of the listener. Traditional language learning emphasizes the behavior of the listener when children are asked to come up with a response to a question, either through receptive or expressive language. It is also important to react appropriately to the verbalizations of other speakers. However, the more pressing issue is to teach children how to behave as the speaker (Sundberg & Michael, 2001). That is, they should know how their manipulation of sounds and words will get others to react to them and result in a form of reinforcement.

Table 1. Definitions

Term	Definition
Verbal Behavior	behavior that is reinforced through the mediation of another person's behavior (Skinner, 1957, p.1-2)
Verbal Operant	any verbal function that is the learned relationship between antecedent and consequence that speakers emit to enable a response in a listener (Greer & Ross, 2008, p. 27)

Term	Definition
Functional independence	one verbal operant has no effects on another verbal operant (Goldsmith, LeBlanc, & Sautter, 2007)
Controlling variables	the stimulus events that occur before a verbal response, which make it more likely that a particular verbal response will occur (Sundberg & Michael, 2001)
Establishing operation	a general term for any environmental change that functions like deprivation, satiation, and aversive stimulation in momentarily altering the reinforcing effectiveness of other events and in altering the frequency of occurrence of the type of behavior that is a consequence of those other vents (Michael, 1982, 1988, 1993; as cited in Sundberg & Michael, 2001)
Mand	a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation (Skinner, 1957, p. 35-36)

Term	Definition
Tact	the verbal unit under the control of stimuli from the world of things and events which a speaker is said to talk about (Skinner, 1957, p. 81); basic labeling of stimuli
Echoic	the repetition of a vocal response (Barnes-Holmes, Barnes-Holmes, & Cullinan, 2000, p. 73)
Intraverbal	verbal interchanges to stimuli when no formal correspondence exists between the stimulus and the response (Barnes-Holmes et al., 2000, p. 74)

Applied Behavioral Analysis

Utilizing highly individualized interventions, Applied Behavior Analysis (ABA) is a treatment approach focused on using behavioral principles to treat socially significant problems. It involves the process of systematically applying interventions based upon behavioral principles and using behavioral research designs to demonstrate that the interventions utilized are responsible for the changes in socially meaningful behaviors. It has been used in a variety of settings (e.g., home, school, hospital, etc.) with a variety of individuals (e.g., individuals with developmental disabilities, athletes, hospital patients, etc.) and in a variety of disciplines (e.g., psychology, exercise science, business, etc.). Assessment methods within ABA focus on the antecedents of the target behaviors and the consequences which occur after the behavior. With

those features in mind, interventions are developed which are functionally related to the reduction of inappropriate behaviors and/or the increase of appropriate behaviors (Steege, Mace, Perry, & Longenecker, 2007).

This approach utilizes behavioral methodology reflecting principles from operant conditioning. Specifically, it emphasizes schedules of negative and positive reinforcement, a variety of data collection methods through direct observations, the use of shaping, extinction, and prompting, maintenance and generalization procedures, and operational definitions of target behaviors (Sundberg & Michael, 2001). Finally, within ABA, data are continually collected to monitor the participant's progress and to modify the intervention as changes in learning occur (Sundberg & Michael, 2001; Steege, Mace, Perry, & Longenecker, 2007).

Early Intensive Behavioral Intervention

Using ABA as its framework, the most widely supported treatment for children with autism is the Early Intensive Behavioral Intervention (EIBI) approach (Eldevik, Hastings, Hughes, Jahr, Eikeseth, & Cross, 2009). EIBIs or EIBTs (Early Intensive Behavioral Treatment; Cohen, Amerine-Dickens, & Smith, 2006) are highly individualized, address the child's skill domains, depend on finding highly valued reinforcers, are based on contingent reinforcement, and require the delivery of one-on-one, in-home therapy for 20 to 30 hours each week (Eldevik et al., 2009). EIBIs are based on the early research of Lovaas (1961, 1973).

Lovaas investigated verbal behavior in its interaction with nonverbal behavior. He conceptualized verbal behavior as operant behavior that can control both the rate of its own recurrence and nonverbal or physical behavioral responses. His interest was not in the different types of the verbal operants, but in their function related to physical behaviors. He believed that verbal operants were discriminative stimuli for nonverbal behavior. That is, if a child emits

aggressive verbal responses (e.g., you are a bad doll!), he/she will more likely emit aggressive nonverbal responses (e.g., hitting the doll) (Lovaas, 1961).

Though the ultimate focus of treatment is typically on the increase or decrease of nonverbal behaviors, communicative language has also been targeted. Sundberg and Michael (2001) describe a feature often associated with the Lovaas approach: Discrete Trial Training (DTT), in which language skills are broken down into a number of independent tasks, and learning usually occurs within a designated setting (e.g., at a table). Typically, the stimulus items are chosen by the clinician and tasks are repeated until a predetermined criterion is met. Within an interaction, the clinician presents a stimulus item even though sometimes the stimulus item may not be functional within an interaction. For example, a clinician may point to a cookie and ask the child to label the item without giving the child the cookie. Reinforcement is then given after a correct response or successive approximations. The differentiation between "receptive" (e.g., pointing to a cookie after being asked to point a cookie) and "expressive" (e.g., saying "cookie" after being asked to name a food item) language responses are emphasized.

However, according to Carr and Firth (2005), EIBIs or the "Lovaas approach" programs have approached language development in a slightly different way from Skinner's *Verbal Behavior* principles. The use of "receptive" and "expressive" terminology reflects an adoption of features of a psycholinguistic or structuralist model, which does not necessarily teach the child with autism the discrete functions of language. More notably, language training within the Lovaas approach is often conducted in a "highly structured, analog environment" (p. 19). This learning environment restricts the child's verbal responses to very specific stimulus controls.

The EIBI approach has been demonstrated to be effective in increasing social interactions, spontaneous social interactions, and spontaneous use of language. It has also been

found to improve performance on standardized measures such as social intelligence quotients, intelligence quotients, and adaptive behavior scores. Notably, this approach has led to decreases in self-stimulation and echolalia (Lovaas, 1973; Cohen et al., 2006; Eldevik et al., 2009; Eikeseth, Hayward, Gale, Gitlesen, & Eldevik, 2009). However, the verbal repertoires of children with autism within the Lovaas approach may not be the main focus of treatment.

Why Verbal Behavior Analysis Works with Children with Autism

The Verbal Behavior Analysis (VBA) approach also utilizes Skinner's *Verbal Behavior* (1957) as the main tenet for therapy for children with autism. This approach shares many similarities with the EIBI approach to language including: delivery of reinforcers contingent upon correct performance, facilitation of specific and frequent daily training opportunities, discrete trial training format for the presentation of instruction and consequences, and production of carefully contrived and organized training environments (Carr & Smith, 2005).

However, the VBA approach differs in several important ways from the EIBI approach. First, it initiates language training in the presence of the stimuli and controlling variables that must eventually control and maintain the verbal behavior of the child. That is, therapy is done within the natural environment and the setting variables encouraging the child's verbalizations are naturally-occurring (e.g., "I need to go to the bathroom").

Second, it focuses on the generalization of target responses and variations of those responses across naturally occurring conditions in which the child needs to utilize speaker behavior (e.g., child asks for a reinforcer that is not accessible to her/him). Using establishing operations to make a verbalization more likely, the child learns to mand for missing items, for information, and to remove aversive stimuli.

Third, VBA dissects "verbal behavior" into units of analysis. Each verbal interaction between listener and speaker can be divided to verbal operants. It is considered important in this approach to classify the actual verbal skills children with autism have mastered (Carr & Smith, 2005; Delprato, 2001).

Finally, the application of operant conditioning principles is intended to improve the rate and duration of the child's verbal behavior. Sundberg and Michael (2001) purport that when the child learns to engage in the appropriate verbal operant (e.g., saying "I want a cookie" after being prompted to echo or after hearing "What do you want?" in order to receive the reinforcer [the cookie]), than the child learns that verbal behavior provides reinforcement. Additionally, an assumption of VBA is that the child's behavior is reinforcing without another person providing the reinforcer (e.g., pretending to answer the phone and saying, "Hi!").

In a study conducted by Williams and Greer (1993), the verbal behavior approach was compared with the Lovaas approach. Children with autism who were taught VBA were likely to emit more words than children with autism taught in the linguistic or EIBI approach. Moreover, children with autism taught with the VBA approach were more likely to use the words they learned in subsequent follow-up sessions and emitted more correct responses than children with autism taught in the EIBI approach.

Due to the growth of VBA, the psychological literature has seen a significant increase in the number of citations of Skinner's *Verbal Behavior* in recent years. Using the analysis of *Verbal Behavior,* there are many opportunities for applied, basic, and observational research with individuals who have limited but complex verbal repertoires (Dixon, Small, & Rosales, 2007).

Why Single-Subject Designs are Appropriate for Children with Autism

Within the autism literature, single-subject designs have been the primary research method. This may be due to the strong presence of ABA approaches to determine the treatment effectiveness in children with autism. Within ABA, there is typically an emphasis on single-subject designs, also referred to as within-subject replication experimental studies (Horner, Carr, McGee, Odom, & Wolery, 2005). Additionally, single-subject research designs offer a number of features that make them appropriate for the investigation of treatments for children with autism. In this design, the individual student is the unit of concern and the intervention is designed specifically for that individual. The idiosyncratic nature of children with autism calls for specialized treatment. Therefore, the intervention is implemented and can be modified to be aligned with the child's progressing needs (Odom, Brown, Frey, Karasu, Smith-Canter, & Strain, 2003).

More importantly, single-subject designs are experimental in nature with baseline and intervention. Single-case designs can tighten the control for extraneous variables that might account for changes in the outcome variables. There are also variations of these designs (multiple baseline, changing criterion, etc.), which are utilized to match the appropriate aspects of intervention (behaviors, settings, individuals, etc.). Furthermore, single-case designs can analyze the characteristics of individuals who do or do not respond to specific interventions (Horner et al., 2005).

According to Odom, Brown, Frey, Karasu, Smith-Canter, and Strain (2003), the types of interventions utilizing the single-subject design have been plentiful, but only recently have there been studies done to validate their effectiveness in comparison to each other. Adult-initiated prompting and differential reinforcement procedures have been shown to be well-established

interventions. Emerging and effective interventions include interventions focused on peer-mediated instruction, visual supports, self-monitoring, and family involvement. Videotaped modeling, positive behavior support, and moderating characteristics of a task were found to be probably efficacious. As such, the single case research design has been determined to be the research design of choice for evaluation of the treatment of social, behavioral, and academic deficits in children with autism (Odom et al., 2003; Horner et al., 2005).

Most specifically, single-subject designs have been used by researchers seeking empirical evidence targeting verbal behavior of children with autism. VBA utilizes single-case research designs to evaluate the effectiveness of instructional interventions. These interventions are highly individualized because forms of verbal behavior are selected and targeted at the level the child finds attainable and functional (Greer & Ross, 2008). Probes or test trials of the current use of verbal operants are conducted both before the intervention begins and during the intervention. Greer and Ross (2008) encourage anyone conducting VBA (e.g., parent, teacher, therapist, etc.) to be in the role of "a strategic scientist", in which there is always constant attention given to the outcome of intervention. The use of graphed displays of progress or lack of progress resulting from the child's individualized instruction should be used to make decisions about the child's instructional needs at each point of teaching.

Studies demonstrating the effect of the intervention in one particular setting are the norm in single-case studies. However, single-case studies which include generalization procedures are stronger than studies which do not, especially when language use is specifically assessed. According to Stokes and Baer (1977), generalization procedures are needed to demonstrate that the skill is learned across time, persons, settings, and behaviors. Studies which include generalization sessions demonstrate the effectiveness of the intervention operating across

different settings, materials, teachers/program implementers, response modalities, and conversational topics (Charlop-Christy & Kelso, 2003; Krantz et al., 1981; Krantz & McClannahan, 1993). For example, children who were taught with scripts to engage in conversation with peers were assessed initially in their academic classroom. This procedure was then conducted with a different teacher, with different materials, and during different activity periods. The children in the study were able to initiate conversations with peers at the same level as they did in their primary setting. Furthermore, the participants' levels of social initiations are within the same range as nondisabled children (Kranz & McClannahan, 1993).

Why Intraverbal Training Should be Emphasized in Verbal Behavior Analysis

A marked feature of autism is a severe deficit in reciprocal social interaction, and one of the main facets of a social interaction is the recognition of a personal deixis. Embedded in this deficit is the individual's development and use of pronouns. Intraverbals are units of verbal behavior in which there is no point-to-point correspondence. That is, the verbal response is not topographically similar to the antecedent stimulus. For example, in a conversation, children are asked a question (i.e., "what's your name?") that does not provide them with a direct link to the stimulus. Different methodologies within VBA highlight the matched fit of this approach to the language development of children with autism. Interventions specifically targeting *intraverbal behavior* (i.e., the verbal behavior between two or more individuals) are especially needed to increase reciprocal social exchanges, and more specifically, target pronoun use in children with autism.

A study by Goldsmith, LeBlanc, and Sautter (2007) outlined that there is a developmental progression in the use of different verbal operants. The child first acquires the ability to tact or to label items physically present in the child's environment. The child then learns to mand,

asking for something or an action that they desire. The child then learns intraverbals when conversation is being learned.   The developmental progression essentially comes from the transfer of stimulus control through the switching of verbal operants. For example, children with autism were taught intraverbals by first learning to tact several picture prompts in different categories (e.g., child said "lion" after seeing a picture of a lion and child said "banana" after seeing a picture of a banana). They then generalized these tacts into responses within an intraverbal exchange (e.g., teacher said, "What are some animals?" and child provided responses).

To teach intraverbal behaviors through social interaction, Kranz and McClannahan (1993) used script-fading. Script-fading is a procedure in which the child is taught written scripts to use in various situations (e.g., "Hey, do you want to play on the playground with me?"), and the scripts are faded to increase the child's independent use of the phrase. Four participants with autism were assessed at their school and research center during their day school program. Pre-session activities were conducted in an outdoor play location, and intervention activities occurred in a typical classroom.

The target behavior was the child's initiations with peers, and this was defined as "understandable statements or questions that were unprompted by an adult, that were directed to another child by using his or her name or by facing him or her, and that were separated from the speaker's previous vocalizations by a change in topic or a change in recipient of interaction" (p. 123-124). The number of responses by the participant during classroom and generalization sessions, and the number of scripted and unscripted initiations were measured through a continuous event recording system. A partial-interval recording method with one minute

intervals was used in a multiple baseline across subjects design. Each of the 10-minute assessment sessions were videotaped, coded, and analyzed.

The purpose of the study was to investigate the effectiveness of a script-fading procedure on the reciprocal social initiations to peers by children with autism. During the baseline phase, the children participated in three art activities and were given written instructions of "do your art" and "talk a lot". The teacher did not interact with the student unless the student directed questions specifically to the teacher. During the intervention, the student engaged in the same art activities. The two written instructions were provided by the teacher and were additionally followed by scripts including 10 statements and questions. These scripts were related to the activities the children previously completed (e.g., playing on the playground), the activities the children were going to do in the near future (e.g., planning an end-of-the week party), and objects in the classroom (e.g., desk materials).

To teach the children to use the scripts, the teacher would manually prompt the child to use a pencil to follow along and read the script. The manual prompts were faded during different sessions for each child, and after the manual prompts were faded, the scripts were faded.

Results indicated that the four participants increased their total initiations, both scripted and unscripted, and their responses in conversation compared to baseline levels. The authors concluded that the script-fading procedure was successful in increasing frequencies of social initiations with peers. In fact, following the intervention, the participants' level of responding was at the same level as three non-disabled peers.

An extension of this teaching procedure is described in a study by Charlop-Christy and Kelso (2003). This study also investigated the effectiveness of scripted conversations using cue cards or written scripts to increase the conversational speech skills of three children with autism.

The participants were literate, but did not demonstrate appropriate conversational speech or interactive turn-taking during conversations. The intervention took place in a therapy room during the children's after-school program.

The target behavior was the child's correct response to an initial conversation question within a ten-second time frame. The frequencies of correct responses were recorded within a multiple baseline across subjects design. In addition, multiple probes were measured during conversations within the treatment setting as well to assess generalization of skills to other situations.

The purpose of this study was to assess the effectiveness of a cue card/written script procedure to teach initiations and to sustain conversations. It should be noted that these procedures require a high degree of language development to begin with. The participant already possessed adequate verbal language skills to be able to learn these procedures. The experimenter asked an initial conversation question (e.g., "do you like to watch T.V."?) and then presented the child with a cue card, on which the appropriate response was written (e.g., "yes, I like to watch T.V.") The experimenter told the child to read the card and to maintain eye contact. Then each participant was told to continue the conversation. For each participant, there were three different conversational strands which included scripts. For the first participant, the three initial conversation questions included: "do you like to watch videos?", "do you like to draw?", and "what did you do last night?" For the second participant, the topics included: "do you like to watch videos?", "what did you do last night?", and "what's your favorite restaurant?" For the third participant, the topics included: "do you like to play games?", "do you like to watch videos?", and "what's your favorite restaurant?"

Results indicated that each of the participants reached 100% correct responding during the testing phase for all three conversational strands. The authors concluded that textual procedures are effective in teaching children with autism conversational skills.

In addition to routine conversational skills about academic topics and daily activities, intraverbal exchanges occur while obtaining basic identifying information. In a study by Finkel and Williams (2001), a single-subject design was utilized to determine the effectiveness of echoic and textual prompts on the acquisition of intraverbal behavior. The participant was a six-year-old boy with autism who was enrolled in kindergarten. The target behavior was the full-sentence answer to direct questions. Questions subject to textual prompts included: "what's your name?", "how old are you?", "where do you live?", and "what's your telephone number?", "what's your favorite color?", and "how are you?" Questions subject to echoic prompts included: "when's your birthday?", "what do you like to eat?", "what's your address?", "what's your favorite movie?", and "what's your mother's name?", and "where do you go to school?" Essentially, the dependent variable was the child's use of intraverbals in social exchanges.

Using an event recording method, the child's use of intraverbals was recorded using a frequency count of correct answers within a 30-minute session. A multiple baseline across behaviors design was utilized to determine the effects of the different types of prompts on 3 sets of responses. Results indicate that the child increased the number of correct answers from 0 at baseline to 1 independent answer when using echoic prompts across all three sets. However, the child increased the number of correct answers from 0.25 at baseline to 2 across sets 1 and 2, and to 1.5 in set 3. The authors concluded that though echoic prompts are typically used and are effective in teaching intraverbal skills, textual prompts are more effective.

Utilizing a VBA approach to teaching intraverbal communication, this study encouraged further research on the effectiveness of textual prompts in the teaching of pronouns and preposition acquisition as well as other complex academic skills for children with autism. Finkel and Williams (2001) also discussed several reasons why textual prompts may be better than echoic prompts. Because of their limited echoic memory capacity, children with autism may not retain the echoic prompt, which is presented vocally and occurs briefly. The textual prompt, in contrast, is a longer stimulus presentation. In addition, children with autism are more likely to have auditory deficits than visual deficits (Freeman & Dake, 1996; as cited in Finkel & Williams). Textual prompts may be seen as less aversive than echoic prompts. Children with autism have difficulties with social interaction, and presenting echoic prompts face-to-face or in near vicinity may be aversive. In addition, for children with autism, textual prompts tap into their reading abilities and may enhance their recognition of new vocabulary words and comprehension of the words they use within a social interaction (Charlop-Christy & Kelso, 2003).

Statement of Problem: What is Missing in the Pronoun Use Literature for Children with Autism?

Children with autism have a unique assortment of behavior excesses and deficits. A particular deficit that has been the focus of various treatment programs is the child's development and use of language. Associated with this deficit are the lack of social interaction and the lack of recognition of a personal deixis. This is made evident in the abnormal use of pronouns by children with autism. There have been many methodologies to measure pronoun use by children with autism (Lee et al., 1994; Silberg, 1979; Bartak & Rutter, 1974; Loveland & Landry, 1986); however, none have utilized a VBA approach.

Within the VBA approach, the emphasis is on the child's acquisition of different types of verbal operants and her/his correct usage of each one. To evaluate the effectiveness of the VBA approach, particularly in intraverbal language training, the single-case research design has been utilized. There are many types of intraverbal exchanges and the focus of these exchanges can center on identifying information, classification ("tell me three animals), positions ("give me the one in the middle"), comparisons ("point to the biggest one"), along with other adaptive and academic skills. As such, the VBA approach to treatment is a perfect match to increase pronoun use by focusing on intraverbal behaviors within social exchanges. More specifically, the teaching methods which have been utilized included cue cards, written scripts, fading of prompts, textual and echoic prompts, and contingent reinforcement procedures. More importantly, there were high level entry criteria for the participant's verbal skills which should be considered.

In the present study, the participant is a six-year-old boy diagnosed with autism and the majority of his intervention took place at his home. The target behavior was the boy's correct and independent use of the pronoun phrases: *It's mine, It's yours, It's his,* and *It's hers.* The boy's use of pronouns was measured using event recording, and reported as 0, 0.5, or 1 point depending on correctness. An incorrect response was marked as 0 points, a partial response as 0.5 points, and a complete, independent response as 1 point. The study utilized a single-subject multiple baseline across four stimulus sets design. The purpose of this study was to investigate the effectiveness of a multicomponent intervention which included textual and echoic prompts and contingent reinforcement procedures as an instructional method for increasing the correct use of pronouns by a child with autism.

Hypothesis

The research question is: Will a VBA-based multicomponent package treatment prove to be effective in increasing correct pronoun use by a child with autism? The hypothesis is that the participant's correct use of pronouns will increase from baseline levels to intervention levels due to the effects of the VBA-based package treatment.

CHAPTER 3: METHODS

Participant

The participant, K.H., is a six-year-old boy, receiving at least 20 hours of verbal behavior analysis therapy per week as part of a home-based behavioral program. He is also attending Kindergarten in a regular classroom for 20 hours per week. His teacher reported that K.H. is reading at a second grade level based on observations and curriculum-based tests. K.H. is pulled out for individual services in a resource classroom for five hours a week. He lives with his biological mother, father, sister, and brother in an area with high socioeconomic status families. After several years of intensive speech therapy, K.H. was diagnosed with autism at age three by his developmental pediatrician.

K.H. has been in a VBA program under the services of Behavior Consultation and Psychological Services, Inc. since October 2008, when he was 5 years old. Being high functioning, he has a variety of verbal skills, responds to requests, independently uses mands, maintains eye contact, and points to items. His inappropriate behaviors include: hand-mouthing, nose-picking, slapping his head, touching other people's hair, touching people's cheeks, and slapping other people's hands. His strengths include: being able to recite the alphabet fluently, being able to write all capital and lowercase letters as well as kindergarten and first grade sight words, reacting appropriately to social, verbal, and physical reinforcers (e.g., high-fives, "You are so smart!", tickles), and having a sense of humor (e.g., calling the therapist "Grandma" and smiling). With these features of his language in mind, K.H. seems to have contextual (i.e., having the ability to make jokes) and conditional (i.e., having the ability to recognize contingencies) capabilities.

It should be considered that K.H. also learned how to echo responses and often engaged in echolalia in early stages of learning worlds. However, his current verbal repertoire consists of appropriately using tacts to label objects, people, and places. His consistent mands include, "give it to me", "which one?", "tell me more", "who?", "when?", "why are you doing that?", "can I have that?", "you open it", "where is it?", and "how do you spell it?" He also has intraverbal skills including knowing his name, his phone number, his address, his age, his birthday, his favorite foods, his school, his favorite color, and his family member's names. He also responds to "I see…" verbal prompts and "I'm thinking of…" prompts. He responded to open-ended questions, thus, indicating that he is not stimulus bound (whereas it is typical of children with autism to be stimulus bound). He has a lot of skills but there are gaps in his verbal repertoire.

K.H. also has difficulty answering direct questions without any prompts. Although the participant in the study displays adequate verbal skills, his use of pronouns is observed to be inconsistent. Pronoun misuse is commonly observed with a reversal of *my* and *your*, *mine* and *yours*, and *his* and *her/hers*.

Therapists

Two therapists were involved in this study. Both of the therapists were trained in VBA by the family's behavioral consultant, were supervised in a practicum placement by a licensed psychologist, and were familiar with K.H. and his family. Both therapists were graduate students in psychology. Training of one therapist by another, as well as training of the reliability observer, took place 30 days prior to the first baseline session. One of the therapists also viewed videotapes of the other therapist during sessions in order to ensure consistency of procedures across therapists. In terms of data collection, the duration of the current study was 41 days.

Setting

Consistent within the VBA approach, generalization was embedded within the study. Therefore, the intervention was implemented by two therapists and materials included a variety of clothes, foods, and toys. The majority of the intervention sessions took place in the participant's home, in a suburban town in eastern North Carolina. Two sessions were conducted outside of the home setting for generalization purposes: one at a local Baskin Robbins and another at a local Dunkin' Donuts. The room where most of the intervention took place is the "schoolroom", with a token table, two chairs, and a drawer containing tangible reinforcers. It is located on the second floor of the house adjacent to the child's play room.

Measurement and Experimental Design

The experimental design used was a multiple baseline across four stimulus sets design. This design was used to determine the effectiveness of textual and echoic prompts across four sets of pronouns. By staggering the onset of the intervention and if a change is seen between baseline and intervention across the four sets of pronouns, a causal relationship can be demonstrated between the teaching techniques and K.H.'s gains in pronoun usage.

This study investigates the effectiveness of a VBA-based multicomponent package treatment on pronoun use by a child with autism. The independent variable is the presence of a multicomponent package treatment (textual and echoic prompts and contingent reinforcement). The dependent variable is the number of complete correct responses to the question, "whose ___ is it?" Additionally, internal controls were established to measure reliability of the data, in both the outcome variable and the independent variable

Dependent Variable

This section describes the data collected in the study. In terms of data collection, the daily observation form is a checklist of teaching tasks obtained from *Teaching Children with Autism or Other Developmental Disabilities* (Sundberg & Partington, 1998) manual. This form was modified to allow for systematic data collection (see Appendix B for baseline, Appendix C for textual only, Appendix D for textual and echoic phase, and Appendix E for the summary sheet). Additionally, the checklist format of the forms was used to measure interobserver agreement as well as to collect treatment fidelity data.

The target behavior (i.e., dependent variable) is the child's correct production of a pronoun phrase after being asked, "whose ___ is it?" The behavior is an event behavior, meaning that it is discrete and occurs only for a short period of time. Thus, the recording method to be utilized is a frequency count of (a) K.H.'s independent correct responses to direct questions utilizing pronouns, (b) K.H.'s correct partial answers, and (c) no or incorrect responses. Based on the procedures from Finkel and Williams (2001), a complete response which is made independently was scored as 1 point (e.g., "It's mine"). A partial response which was made independently (e.g., saying "Mine", pointing to self) was scored as 0.5 points. No responses, incorrect responses (e.g., saying a name "It's Chad's", saying "It's yours" instead of "It's mine") or responses that occur after a ten-second time delay were recorded as 0 points.

K.H. was expected to increase the number of correct responses after being asked questions with pronouns. The pronouns targeted for the study consisted of four stimulus sets: *It's mine, It's yours*, *It's his, and It's hers*. Each of the four sets of pronouns was measured during baseline, during the textual prompt only phase, and during the textual and echoic prompt

phase. Eight questions were divided into 4 sets of two questions each (see Table 2). Use of many exemplars provided the child with multiple opportunities to respond.

Table 2. Experimenter Questions and Participant Responses

Experimenter	K.H.
Set 1 Touch your ____ Whose ____ is it?	**Set 1** Touches item It's mine
Set 2 Touch my ____ Whose ____ is it?	**Set 2** Touches item It's yours
Set 3 Touch his ____ Whose ___ is it?	**Set 3** Touches item It's his
Set 4 Touch her ____ Whose ___ is it?	**Set 4** Touches item It's hers

Interobserver Agreement

Training of the therapist and reliability observer occurred before the data collection procedures began. The reliability observer was told minimal details regarding the study in order to be as objective as possible. In terms of measuring the target behavior, interobserver agreement was assessed in home and outside-the-home settings during baseline and textual prompt only phases. Due to the parent's sudden imposition of a time limit on her permission to conduct the study, no reliability data were available during the textual and echoic phase. The therapist and another observer (i.e., another therapist) marked on separate forms whether the child emitted a correct independent response, a correct partial response, or an incorrect or no response. After the session, the therapist compared her data with the data collected by the reliability observer to measure interobserver agreement.

The reliability observer was blind to protocol and conditions. An agreement was recorded when the two observers marked the same response similarly (e.g., both observers checked Independent Correct Response), and a disagreement was recorded when the two observers marked the same response in differing manners (e.g., one scored it as Incorrect Response, while the other scored it as Partial Correct Response). Interobserver reliability was calculated using the kappa coefficient, which is a chance-adjusted calculation of inter-rater agreement. The kappa coefficient, κ, takes into account the number of observed agreements and the number of agreements expected by chance.

According to the web-based statistical calculator created by GraphPad Software, Inc. (2002-2005), the resulting kappa coefficient is $\kappa = 50.0\%$, indicating that interobserver agreement between the therapist and the reliability observer was in the fair agreement range (Bryt, 1996). However, the acceptable range for kappa is at least $\kappa = 60.0\%$. These issues lead to a lack of confidence in the consistency of measuring data from one person to another, which limits conclusions that can be drawn from the data.

Independent Variable

This section describes the intervention used in the study. The selection and progression of these pronouns and the intervention procedures were described in *Teaching Children with Autism or Other Developmental Disabilities* (Sundberg & Partington, 1998), and were modified to fit the individual needs of the child.

According to Sundberg and Partington (1998), in the original procedure, the task was to have the student answer "who/whose" questions (e.g., "whose shoe is that?"). First, the researcher must make sure that the child can tact and receptively identify items used in the intervention. Then the researcher selects a stimulus that is clearly possessed by each individual

such as clothing or body part. The researcher then asks the child to "Touch your shirt" and reinforce correct responses. Incorrect responses are followed by appropriate correction procedures (e.g., physical prompting, fading, and differential reinforcement).

After the child touches "My juice" (the child's juice box, which is clearly possessed by the child), the researcher asks, "Whose juice is it?" and reinforces the response, "My". This response is accepted at first, and is shaped toward "my juice". If an incorrect response occurs, an echoic prompt is provided while touching the shirt. If the child provides the echoic response, the researcher then reinforces the child. The researcher then represents the trial. The researcher pretends to take the juice while asking, "whose juice is it?" and returns it to the child when the child says "my" (i.e., from "my juice").

For the current intervention, the "Touch" portion of the procedure was retained to follow the original procedures, although the data were not reported, since the child already presented a complex verbal repertoire and knew how to tact items readily. Additionally, because of the child's complex verbal repertoire, the appropriate responses were modified from "my ____" to "It's mine" or "It's my ____" to make the response a complete sentence. More importantly, instead of using the echoic prompts as noted in the original procedure, this intervention used textual prompts and then used textual with echoic prompts. Moreover, the presentation of teaching trials were conducted in a staggered manner instead of one by one as outlined in the original procedures.

Procedures

University and Medical Center Institutional Review Board (UMCIRB) approval was obtained prior to the study, and parent consent was acquired (see Appendix A).

The experimental procedures were underway and baseline was taken. Then, the in-home program changed in several ways due to changes determined by the main consultant. The changes affected the procedures in several ways including a change from textual only to textual and echoic prompts, and the limitation of generalization procedures because of changes made from data-driven and program-driven decisions.

During baseline and intervention, K.H. learned and utilized a token system to earn tangible reinforcers. The therapist sat at a 90 degree angle from K.H. and had access to a container of tokens and a drawer of reinforcers. There were a number of token boards that K.H. chose from in order to earn tokens. K.H. vocally stated his desired reinforcer as he sat at the table, and the therapist put that item in a dental cup in front of him, and then put the token board directly in front of him.

K.H. was free to choose any item that he wished to earn. Some of his most preferred and most frequently requested items included: Rangin' Ranch potato chips, Lay's wavy potato chips, pizza-flavored Goldfish crackers, Cheese Curls, red or orange Starburst squares, Sprite, Diet Coke, Jelly Beans, Smarties, Pringles and Cheez-its. In addition to these tangible reinforcers, social reinforcers such as verbal praise, quick physical games such as tickling or hand gestures, high 5's, silly songs, and hugs were also provided.

During the baseline phase, K.H. was first asked to touch a stimulus item chosen by the therapist. Then the therapist asked K.H., "whose ___ is it?" The therapist completed this procedure for all four of the stimulus conditions (see Appendix A). Correct independent, partial, and no responses were recorded. Based on the procedures outlined in Finkel and Williams (2001), no corrective feedback was given, but reinforcement was provided contingent on the child's effort during the session (e.g., "Thank you for sitting!", "Thank you for saying that in a

good voice!") as well as tokens. This was done to keep the child on-task. In addition, no prompting or teaching occurred during baseline sessions.

The intervention contained two separate procedures: the textual prompt only phase and the textual and echoic prompt phase. In the textual prompt only phase, the child was asked the stimuli questions (see Table 3) within a five to 15 minute time period. If the child answered the question correctly and independently, then the therapist marked that K.H. received 1 point and provided praise and a token. If K.H. answered the question with a partial response independently (i.e., "mine"), the therapist marked down 0.5 points. If K.H. did not answer the question correctly, the therapist marked down 0 points. If the child answered a partial response or incorrect/no response, the therapist said, "no" or "nope" and presented the textual prompt by saying "read this". The child was presented with the textual prompt, which is the correct phrase (i.e., "It's mine") on a colored index card and handwritten with a black marker. After the child read the card (e.g., "It's mine"), the therapist then praised the child's effort (e.g., "That's right! It's mine!"). Experimenter-determined levels of praise were provided contingent on the degree of correct responses. Moderate verbal praise ("good job" with a neutral voice tone) and a single token were given for the child's effort, whereas highly enthusiastic verbal praise (high volume) and more than one token were given only for complete correct responses of the target pronoun phrases. There is an overlap of ABA in verbal behavior therapy. One of these is discrimination training as described above.

Specifically, the steps that were used to elicit the target behavior are included in Table 3.

Table 3. Procedures during Intervention: Textual Only Phase

Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)
Ask the K.H., "touch your (my/his/her) _____"
Reinforce correct responses
If incorrect, follow incorrect responses with correction procedure (physical prompting)
Ask K.H. "whose ____ is it?"
Reinforce response of mine by saying anything BUT "Right, it's your cookie"
If incorrect, say, "no" or "nope", then say "READ THIS!". Provide textual prompt and reinforce the correct verbal response (Right! Or Great job! Or Here (and give preferred item)

There were five sessions allotted for the textual prompt only phase before the textual and echoic prompt phase began. Textual prompts were implemented for only a short period of time because of an evaluation from one of the therapists that the textual only prompt procedures: 1) did not provide an opportunity for the child to respond after the prompt was given; and 2) the child appeared to be reading the card instead of applying the prompt to the stimulus item. When the therapist asked K.H. to "read this," he simply read the prompt without understanding the connection with the stimulus item. Thus, the data reflected the lack of improvement and a change was made in the procedures.

The textual and echoic prompt phase was implemented and it included: 1) another opportunity to respond; 2) changed the vocal direction from "read this" to "say this"; and 3) had the child echo the therapist after she said the appropriate pronoun phrase. Since the child did not meet mastery criteria within the five textual prompt only sessions, the procedures of the textual and echoic prompts were implemented without delay. Data were collected using textual and echoic prompts until the intervention was implemented with all four stimulus sets.

In the textual and echoic prompts phase, the child was asked the stimuli questions (see Table 4) within a 5 to 15 minute time period. If the child answered the question, "whose ____ is it?", correctly and independently, then the therapist marked that K.H. received 1 point and

provided praise and a token. If K.H. answered the question with a partial response independently (i.e., "mine"), the therapist marked down 0.5 points. If K.H. did not answer the question correctly, the therapist marked down 0 points. If the child answered a partial response or incorrect/no response, the therapist said, "no" or "nope" and presented the textual prompt by saying "say this", and immediately saying the prompt, "It's mine". The child was presented with the textual prompt, which is the correct phrase (i.e., "It's mine") on a colored index card and handwritten with a black marker. After the child read the card (e.g., "It's mine") and echoed the therapist's statement of "It's mine", the therapist then praised the child's effort (e.g., "That's right! It's mine!").

The therapist then asked the child again, "whose ___ is this?" If K.H. answered the question with a complete response, the therapist marked down 1 point, a partial response (i.e., "mine") earned 0.5 points, and if K.H. did not answer the question correctly, the therapist marked down 0 points. Again, experimenter-determined levels of praise were provided. Moderate verbal praise and a single token were given for the child's effort after the prompt was given. Highly enthusiastic verbal praise and more than one token were given for complete correct responses of the target pronoun phrases.

The therapists were required not to use any pronouns during praise or reinforcement of the child's responses because that may confuse K.H., since they would be reversing the pronouns. For example, after K.H. correctly responds to the question, "whose cookie is it?" by saying "It's mine", the therapist should not respond by saying, "That's right! It's *your* cookie!".

Specifically, the steps that were needed to be fully successful in the target behavior are included in Table 4.

Table 4. Procedures during Intervention: Textual and Echoic Prompt Phase

Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)
Ask the K.H., "touch your (my/his/her) _____"
Reinforce correct responses
If incorrect, follow incorrect responses with correction procedure (physical prompting)
Ask K.H. "whose _____ is it?"
If child responds with "IT's MINE", reinforce response by saying anything BUT "Right, it's your cookie"
If incorrect, say, "no" or "nope", then say "SAY THIS!" Provide *textual* prompt, and provide *verbal* prompt at the same time (e.g., "It's mine").
Reinforce the echoing of the prompt. (Right! Or Great job! Or Here (and give preferred item))
Immediately after, REMOVE textual prompt and ask child again, "whose _____ is it?"
If child responds with "IT's MINE", reinforce response by saying anything BUT "Right, it's your cookie". If incorrect, do another trial with SAME object.

Multiple teaching sessions (approximately ranging from 2 to 6 sessions) occurred prior to the probe of K.H.'s pronoun use. Procedure implementation periods varied in length from approximately 30 to 90 minutes, with a range of 2 to 6 sessions within each time period. Probes within each teaching session were obtained when K.H. was asked the stimulus question (i.e., "whose _____ is it?") without correction or prompts. Teaching sessions included providing textual prompts or textual and echoic prompts to K.H. if he responded with an incorrect or partially correct response. Each presentation of the stimuli was recorded. K.H.'s responses, including his prompted or independent responses, were recorded. The data were recorded by the therapist.

Unfortunately, during the final weeks of data collection, the parent prematurely withdrew permission to continue the study. In terms of reliability training, this affected the ability to either: (a) retrain the reliability observer to be more accurate in the data collection procedures

after evaluating the reliability data and (b) train another reliability observer to collect data. Moreover, the limited time due to the retraction affected gathering of more data for follow-up procedures. However, it should be noted that the procedures in the study had sufficient internal controls such as interobserver agreement and treatment fidelity measures to point out inconsistencies.

Measurement of Treatment Fidelity

The reliability observer marked on the Daily Observation Form if the therapist was following the procedures in sequence and correctly. The same forms were utilized during baseline and intervention. During baseline and probe sessions, the reliability observer would not have marked the therapist as using the prompting procedures, denoting the absence of prompts during probe and baseline procedures. During the intervention, the reliability observer would have marked the prompting procedures, indicating that the therapist implemented the prompt during the teaching sessions. The therapist also marked down on her own data sheets when she completed each step of the procedures, marking the prompt during teaching sessions and not marking the prompt during baseline and probe sessions.

The consistency between raters are reported for both baseline, probe, and teaching procedures. An agreement was recorded when the two observers marked the same number of steps completed (e.g., both observers obtained a total of 7 out of 10 steps during the teaching session), and a disagreement was recorded when the two observers marked different number of steps completed (e.g., one obtained a total score of 4 out of 10 steps, while the other obtained a total score of 5 out of 10 steps). Treatment fidelity reliability was calculated using the kappa coefficient, which is a chance-adjusted calculation of inter-rater agreement. The kappa

coefficient,κ, takes into account the number of observed agreements and the number of

agreements expected by chance.

According to the web-based statistical calculator created by GraphPad Software, Inc.

(2002-2005), the resulting kappa coefficient is κ = 24.7%, indicating that interobserver

agreement between the therapist and the reliability observer was in the poor agreement range

(Bryt, 1996). Thus, disagreement occurred as to whether textual prompts were given. This leads

to a lack of confidence in the internal validity of the study, and limits conclusions drawn from

the data.

CHAPTER 4: RESULTS

K.H.'s progress on each of the four stimulus sets is shown in Figure 1. The mean scores for each phase of the study are outlined below.

Table 5. Mean Scores for Baseline and Intervention.

Baseline Data:

Stimulus		Mean
1	It's mine	0.00
2	It's yours	0.00
3	It's his	0.28
4	It's hers	0.07

Intervention Data: Textual Only Phase

Stimulus		Mean
1	It's mine	0.25
2	It's yours	0.33
3	It's his	0.00
4	It's hers	0.80

Intervention Data: Textual and Echoic Prompts Phase

Stimulus		Mean
1	It's mine	0.92
2	It's yours	0.33
3	It's his	0.70
4	It's hers	0.80

According to the above data and the graphed data of K.H.'s behaviors (Figure 1), the trend seen in baseline was that child's correct use of pronouns was lower in baseline for the *It's mine*, *It's yours*, and *It's hers* stimulus sets (M = 0.00, 0.00. 0.07, respectively) compared to the textual only (M = 0.25, 0.33., 0.80) and textual and echoic prompts phases (M = 0.92, 0.33, 0.80). For the *It's mine* stimulus set, K.H. received 0 points for incorrect responses, which included saying his own name, and saying, "yours", during the probe sessions. For the *It's yours* stimulus set, K.H. received 0 points for incorrect responses, which included saying the

therapist's name (i.e., "Miss Gabriella's"), instead of the correct response of "It's yours". There were no occurrences of nonresponsiveness for these two conditions. For the *hers* stimulus set, K.H.'s incorrect responses during the probe sessions included saying "hers" (which was considered a partial response), "Taylor's" (which was an incorrect response because it uses a proper name), and "his", as well as not responding. These responses earned him 0 points.

Compared to baseline ($M = 0.28$), the mean for K.H.'s responses in the *It's his* condition were lower during the textual only phase ($M = 0.00$) but higher in the textual and echoic prompts phase ($M = 0.70$). In the *his* stimulus set, his responses during the probe sessions included saying "the man's" and "Sharpay's", were considered incorrect, which earned him 0 points. He also answered "his", which was considered a partial response, and earned 0.5 points.

No drops in the number of correct responses occurred when new stimulus sets were introduced, except in the *It's mine* stimulus set. In Session 16, when the *It's yours* stimulus set was introduced with textual and echoic prompts, K.H. scored a 0.5. However, it should be noted that he also scored a 0.5 in the previous session when the procedure was used with the *It's yours* stimulus set.

By the conclusion of this study, K.H.'s responses demonstrated a wide variability across stimulus sets. K.H. was independently correct (i.e., receiving 1 point) on the *It's mine* stimulus set 100% of the last 5 sessions. However, K.H. was independently correct an average of 20% in the *yours* condition (1 point over 5 probes), and 60% in the *his* condition (3 points over 5 probes). K.H. was independently correct an average of 80% in 5 sessions of the *hers* condition.

Baseline Logic

The multiple baseline across four stimulus sets design can provide evidence of change in outcome data from the baseline to the intervention, as evidenced by the visual analysis of level

using the mean (Figure 1). It also provides the specific nature of the change due to the trend and slope. In the baseline phase, there was a downward trend with a negative slope, but in the intervention, there was an upward trend with a positive slope. According to baseline logic, without the intervention, the downward slope would have continued. Thus, the data indicated that the intervention may have had an effect.

The percent of non-overlapping data points (PNDs) also points to the effectiveness of the intervention. If there were very little or no PNDs in the baseline and then an increase during intervention, this may indicate treatment effect.

In the *It's mine* stimulus set, the PNDs in the textual prompt only phase were had 50% of non-overlapping data points when compared to data in baseline. Moreover, PNDs in the textual and echoic prompts phase were 83.3% when compared to data in textual prompt phase and 100% when compared to data in baseline.

In the *It's yours* stimulus set, the PNDs in the textual prompt only phase were 33.3% when compared to data in baseline and PNDs in the textual and echoic prompts phase were 35.7% when compared to data in baseline. However, PNDs in the textual and echoic prompts phase were 0% when compared to data in the textual prompts only phase.

In the *It's his* stimulus set, the PNDs in the textual prompt only phase were 0% when compared to data in baseline and PNDs in the textual and echoic prompts phase were 0% when compared to data in baseline. However, PNDs in the textual and echoic prompts phase were 70% when compared to data in the textual prompts only phase.

In the *It's hers* stimulus set, the PNDs in the textual prompt only phase were 80% when compared to data in baseline and PNDs in the textual and echoic prompts phase were 80% when

compared to data in baseline. However, PNDs in the textual and echoic prompts phase were 0% when compared to data in the textual prompts only phase.

However, due to the lack of treatment integrity and interrater reliability, limited conclusions can be drawn from the data. Additionally, there were discrepancies between the four stimulus sets in terms of slope. Whereas *it's mine* had a positive slope that stayed high, *it's yours* had great inconsistencies, and *it's hers* and *it's his* dropped following an upward trend. There were also a great proportion of data points in adjacent phases that overlap in level. In addition, immediacy of the effects was not demonstrated since changes were not seen until 1 to 2 sessions after the intervention was implemented.

Figure 1. Number of questions answered correctly across 4 stimulus sets.
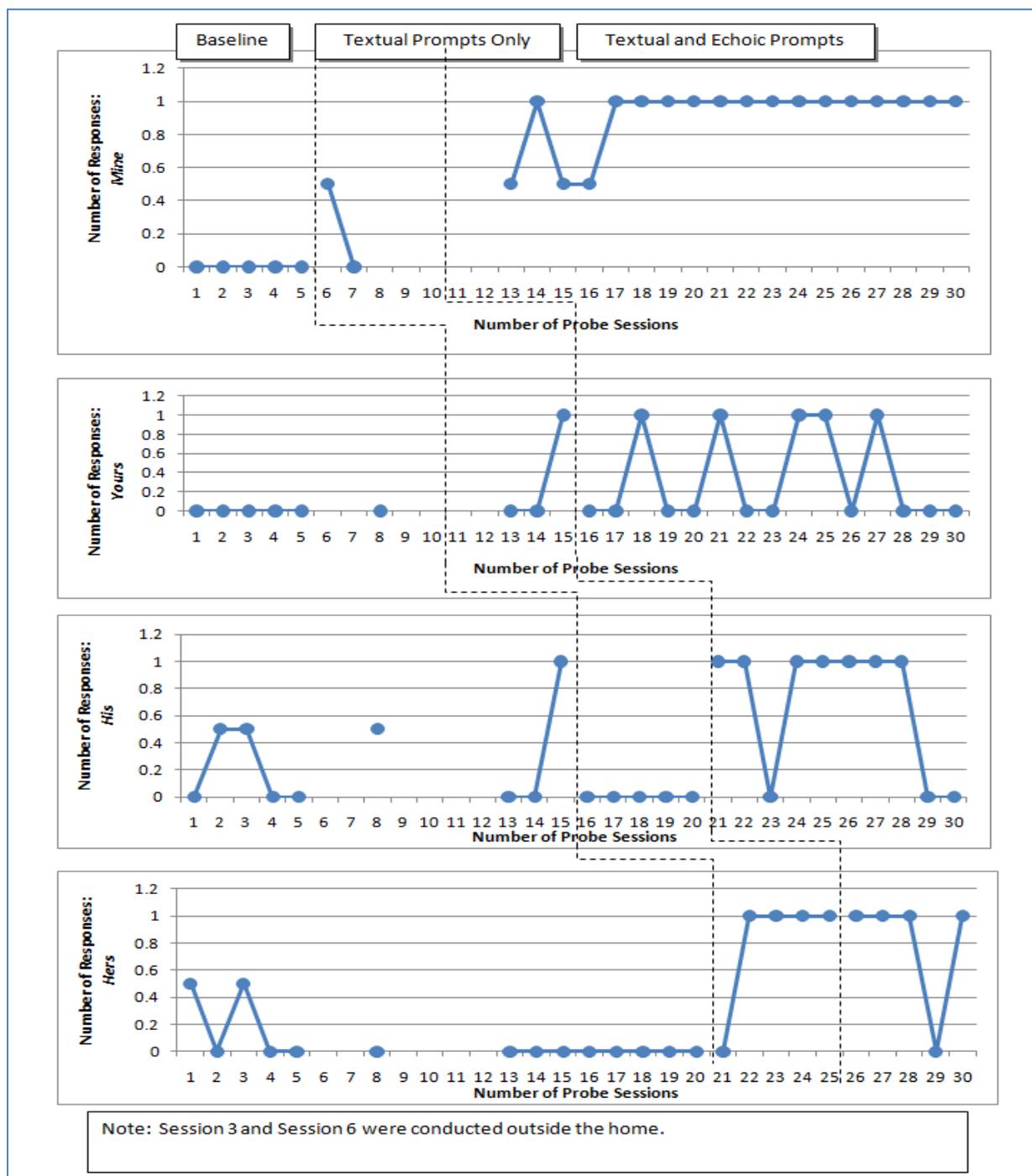
CHAPTER 5: DISCUSSION

Summary

Autism is a neurodevelopmental disorder characterized by behavior deficits and excesses, particularly the deficits of language and social cognition (West, Waldrop, Brunnsen, 2009). One of the characteristics of social cognition is the ability to differentiate the speaker from the listener, or a personal deixis (Fay, 1979). Since children with autism have difficulty with this skill, they have difficulty denoting possession using pronouns (Silberg, 1978; Bartak & Rutter, 1974; Lee, Hobson, & Chiat, 1994; Loveland & Landry, 1986; Jordan, 1989).

In a study by Jordan (1989), children with autism were found to produce pronouns less frequently than normally developing and mentally handicapped peers. Children with autism were more likely to use proper names (the experimenter's name or their own name) than the appropriate pronouns (*you* or *me*, respectively). The data illustrate that K.H. had this exact difficulty when he responded incorrectly across the four stimulus sets. He often responded with the therapist's name when asked, "whose ___ is it?" in the *yours* condition. K.H. also responded with his name during baseline and one textual prompt only probe. He often provided his brother's and sister's name when asked "whose ____ is it?" in the *his*, and *hers* stimulus sets, respectively.

Children with autism who correctly use pronouns are more likely to comprehend reading passages, use multiple descriptors for items, respond correctly to WH- questions, use full sentences within a conversation, and differentiate items of the speaker from those of the addressee (Kranz, Zalenski, Hall, Fenske, & McClannahan, 1981; Fay, 1979). Though it is clearly important to teach children with autism the correct use of pronouns, traditional methods have used structure-based instruction targeting the placement and mechanics of words. In

contrast, verbal behavior focuses on teaching pronouns with a function-based methodology, which makes it more useful for children with autism. It emphasizes different verbal operants in language, and in particular, how verbal units function to reinforce the speaker (Skinner, 1957). Along with the principles of verbal behavior, Applied Behavior Analysis provides the framework for implementation, while the single-subject design is used to evaluate treatment progress (Steege, Mace, Perry, & Longenecker, 2007).

Pronouns are used in the class of verbal units called intraverbals, or conversational exchanges. All utilizing contingent reinforcement procedures, there are several methods of teaching intraverbal skills to children with autism including cue cards (Charlop-Christy & Kelso, 2003), script fading (Goldsmith, LeBlanc, & Sautter, 2007), and textual and echoic prompts (Finkel & Williams, 2001). However, none of these methods were used to teach children how to specifically use pronouns correctly. Thus, there are several features which are missing in the literature investigating pronoun use by children with autism. There is no emphasis on verbal behavior, which is a function-based methodology and has been demonstrated to be effective in increasing the verbal repertoires of children with autism. There is a lack of a research design that experimentally evaluates progress over time, and there is a lack of a specific teaching method to target correct pronoun use.

This study served to fill this need, both theoretically and personally, by asking the research question, will a VBA-based multicomponent package treatment prove to be effective in increasing correct pronoun use by a child with autism. The hypothesis was that the participant's correct use of pronouns will increase from baseline levels to intervention levels due to the effects of the VBA-based package treatment.

Conclusions

In the study by Finkel and Williams (2001), both textual and echoic prompts were utilized. Though in the study, the textual prompts were found to be more effective than echoic prompts, echoic prompts were also found to be effective in the acquisition of conversational scripts by a child with autism. In the present study, the combined use of textual and echoic prompts demonstrated more impact than the textual prompt alone. It should be noted that although K.H. does have the ability to read the textual prompts, coupling his reading of the textual prompt with an echoic prompt also reinforced his learning. It may be that the additional opportunity to respond after the presentation of the textual and echoic prompt could facilitate K.H.'s learning of pronouns.

It could be argued that the procedures are simple discrimination training. However, the intervention is different from discrimination training in that generalization is embedded (i.e., variety of materials, exemplars, etc.). Because the ultimate goal of therapy is for the child to demonstrate functional skills, the intervention should be able to illustrate the child's acquisition, maintenance, and generalization of pronouns. With the elimination of the follow-up probe and generalization procedures, his skills are more difficult to determine. However, the changes reflected in the intervention were implemented due to ongoing evaluation by the therapists and the behavioral consultant. One of the tenets of VBA is to utilize data to monitor the participant's progress, and to modify the intervention as changes in learning occur (Sundberg & Michael, 2001; Steege, Mace, Perry, & Longenecker, 2007). The objective data were used to determine the effects of treatment or lack thereof, and to modify the treatment plan (Van Houten et al., 1988).

The effectiveness of the intervention procedures was not demonstrated. There are several issues which need to be considered in the effectiveness of this study. During the course of the study, the first issue was that the child's program of VBA therapy underwent several changes. This gave way to the second issue which was instead of utilizing textual prompts exclusively both textual and echoic prompts were used to accelerate the participant's learning. The third issue was that a trial session was conducted and it was confirmed that the participant responded positively to the new textual and echoic prompts. In addition, the fourth issue was that the embedded generalization procedures, in which the intervention would have been conducted outside of the home, were not implemented.

The switch from textual prompts only to textual and vocal prompts was a more intense intervention; however, it proved to be more effective as demonstrated by K.H.'s correct responses. Major changes in the procedure, especially the failure to collect follow-up and generalization data make it more difficult to determine the impact of the intervention on pronoun skill acquisition. These changes may not have occurred if consultation with the family and therapists were held in a team format to control decisions, and meetings were held on a consistent basis with the supervisor and behavioral consultant present.

Limitations

The low interobserver agreements were the result of several factors. These low levels of reliability data make it difficult for conclusions to be drawn from the study. In retrospect, the study should not have proceeded until there was reliability. The training sessions between the therapist and the reliability observer were held separately with a week in between. It would have been optimal to have the training with both present to practice the stimulus presentation and anticipate different responses. In addition, a refresher training before data collection would have

been beneficial considering the time delay between the initial training with the therapist and reliability observer and the actual starting date of data collection. A meeting after the first baseline session with both data collectors would have also been beneficial to evaluate agreement, and discuss issues of disagreement.

Lastly, the misinterpretation of the reliability observer about the probe versus the teaching trials could have been prevented if anticipation of the different responses was taken. That is, more practice was necessary to ensure the reliability observer's accurate rating of the child's responses.

Based on the procedures outlined by Finkel and Williams (2001), reinforcement was provided for the child's effort during baseline and intervention. The reinforcement during baseline procedures for effort may be a potential confound because child may not differentiate between learning (correct response) and effort (making a response). Reinforcement should be considered for its effect not for its intention. The child does not know why he was being reinforced, and this may be a reason for the variability of his responses during baseline and intervention.

Due to withdrawal of parental permission in the middle of the study, only five data points (four data points in the home and one data point outside of the home) of 30 probe sessions received interrater reliability data. In addition, because of the limited availability of the reliability observer, interobserver agreement was assessed in all settings during baseline and textual prompt only phases. Because of reliability and internal validity problems, the conclusions are very limited in this study. There was an insufficient amount of reliability data collected, and the data that were gathered indicated very low levels of reliability.

Generalizability

In the same vein, in the best interest of the child during the course of the study, the majority of the intervention sessions were limited to his home setting. Additional generalization procedures, like the baseline and intervention sessions conducted outside the home, would illustrate the child's extension of learning in a setting other than his home. Van Houten et al. (1988) described that a therapeutic environment during treatment should be the one that imposes the fewest restrictions. That is, the child should have freedom of movement and access to desired activities and reinforcers. Though the embedded generalization procedures were limited in this study, the "schoolroom" (in his home) in which the majority of the intervention procedures were conducted was the child's most preferred setting. At this stage in the child's therapy, it was more beneficial to have access to the "schoolroom" than travel to other settings.

Additional procedures to promote generalization would have also included having his relatives conduct the intervention. Due to the observations of the child's slower rate of learning and distractibility when relatives were present, the therapists and the behavioral consultant decided to limit the intervention procedures only to the therapists.

The treatment fidelity results indicate there is uncertainty about the correct implementation of the intervention. As with all single-subject research, the generalization of the results of the study is somewhat limited. The participant was high-functioning and had a complex verbal repertoire. Because of the complexity of pronoun language, the intervention may not be appropriate for a child with more limited verbal abilities. The variability observed in the participant's responses should be considered when interpreting the data, especially in tandem with issues in reliability and treatment fidelity.

Implications

Data collected on reliability did not pass the criteria of acceptable kappa ranges. Though evidence that the valid measurement of the dependent variable is not provided, it has face validity. That is, the procedures used to measure the target behavior (i.e., Whose ___ is it?) indeed "looked like" they measured the child's correct pronoun use. Parent retraction of permission indicates low acceptability of intervention. Though the independent variable was systematically manipulated and under the control of the experimenter, the fidelity of implementation did not meet criteria. The experimental effects are not replicated across participants, settings, or materials; thus, external validity was not established.

However, there seemed to be indications of social validity. This deals with the applied importance of the effects of the intervention. Since the dependent variable is socially important, the study has value. Though there were barriers to interpretation of the data, any indication of upward change in the dependent variable resulting from the intervention is socially important. If this behavior is obtained, then the child with autism can learn a lasting verbal repertoire. Learning pronouns is a cusp behavior, which enables the child to access and shape other behaviors such as: comprehending reading passages, using multiple descriptors for items, responding correctly to WH- questions, using full sentences within a conversation, and differentiating items of the speaker from those of the addressee (Kranz, Zalenski, Hall, Fenske, & McClannahan, 1981; Fay, 1979). Thus, this intervention, though not demonstrated to be effective in this study, is a promising area of future study.

Feasibility

The feasibility of this study is highlighted in a number of ways. Firstly, the necessary materials for the token system and all the child's preferred reinforcers were available in the

participant's home. Secondly, each session only lasted between five to 15 minutes, and in about an hour and a half per day, about four to six sessions were completed. Thirdly, the colored index cards, token board, and tokens would make the intervention easy to implement without great effort by multiple persons, such as: other therapists, relatives, or teachers across multiple settings. Fourthly, because of the simple teaching procedures and the nature of the instruction, different stimulus items can be used for the teaching trials.

Based on this information, the multicomponent package treatment has ease of implementation, includes portable and naturally-occurring stimuli which can generalize to other settings, and is driven by data. For K.H., the next steps in his program will be determined by the behavioral consultant, and at this time, no maintenance or generalization sessions for continuation of pronoun use instruction are scheduled. However, the procedures outlined in this study may be beneficial to other children.

Future Research

This is a promising area for future study. Further research is needed to replicate the results of this combination with other children who have autism: ideally, within the same age range, IQ, and level of impairment. A child does not need to be verbal in order for verbal behavior to work; however, in these procedures, the participant needs to have the necessary verbal prerequisites. Replication of the procedures should be completed only after adequate controls for interobserver agreement and treatment fidelity are in place. If an effect is demonstrated, then the acquisition of pronouns and their proper use facilitates improvement of skills used in intraverbal exchanges within the VBA approach. This would be the first step in helping children with autism develop a stronger personal deixis.

REFERENCES

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*
(4th ed., text revision). Washington, DC: Author.

Bartak, L., & Rutter, M. (1974). The Use of personal pronouns by autistic children. *Journal of
Autism and Childhood Schizophrenia, 4, 3,* 217-221.

Barnes-Holmes, D., Barnes-Holmes, Y., & Cullinan, V. (2000). Relational frame theory and
Skinner's Verbal Behavior: A Possible synthesis. *The Behavior Analyst, 23, 1,* 69-84.

Beeson, P.M., & Egnor, H. (2006). Combining treatment for written and spoken naming.
Journal of International Neuropsychological Society, 12, 816-827.

Blaxill, M.F. (2004). What's going on? The question of time trends in autism. *Public Health
Reports, 6,* 536-551.

Carr, J.E., & Firth, A.M. (2005). The verbal behavior approach to early and intensive behavioral
intervention for autism: A call for additional empirical support. *Journal of Early and
Intensive Behavioral Intervention, 2, 1,* 18-27.

Centers for Disease Control and Prevention (2007). Prevalence of autism spectrum disorders:
Autism and developmental disabilities monitoring network, 14 sites, United States, 2002.
MMWR Surveillance Summaries, 56, 12-28.

Charlop-Christy, M.H. & Kelso, S.E. (2003). Teaching children with autism conversational
speech using a cue card/written script program. *Education and Treatment of Children,
26, 2,* 108-127.

Cohen, H., Amerine-Dickens, M., & Smith, T. (2006). Early intensive behavioral treatment:
Replication of the UCLA Model in a community setting. *Developmental and Behavioral
Pediatrics, 27, 2,* S145-S155.

Cohen J. *Statistical Power Analysis for the Behavioral Sciences.* 2nd ed. Hillsdale (NJ): Lawrence Erlbaum Associates: 1998. 19-27 p.

Delprato, D.J. (2001). Comparisons of discrete-trial and normalized behavioral language intervention for young children with autism. *Journal of Autism and Developmental Disorders, 31, 3,* 315-325.

Dixon, M.R., small, S.L., & Rosales, R. (2007). Extended analysis of empirical citations with Skinner's *Verbal Behavior:* 1984-2004. *The Behavior Analysis, 30, 2,* 197-209.

Eikeseth, S., Hayward, D., gale, C., Gitlesen, J-P., Eldevik, S. (2009). Intensity of supervision and outcome for preschool aged children receiving early and intensive behavioral interventions: A preliminary study. *Research in Autism Spectrum Disorders, 3*, 67-73.

Eldevik, S., Hastings, R.P., Hughes, J.C., Jahr, E., Eikeseth, S., & Cross, S. (2009). Meta-analysis of early intensive behavioral intervention for children with autism. *Journal of Clinical Child & Adolescent Psychology, 38, 3,* 439-50.

Fay, W.H. (1979). Personal pronouns and the autistic child. *Journal of Autism and Developmental Disabilities, 9, 3,* 247-259.

Finkel, A.S., & Williams, R.L. (2001). A Comparison of textual and echoic prompts on the acquisition of intraverbal behavior in a six-year-old boy with autism. *The Analysis of Verbal Behavior, 18,* 61-70.

Goldsmith, T.R., LeBlanc, L.A., & Sautter, R.A. (2007). Teaching intraverbal behavior to children with autism. *Research in Autism Spectrum Disorders, 1,* 1-13.

Greer, R.D. & Ross, D.E. (2008). *Verbal behavior analysis: Inducing and expanding new verbal capabilities in children with language delays.* Boston, MA: Pearson Education, Inc.

Horner, R.H., Carr, E.C., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71, 2,* 165-179.

Jordan, R.R. (1989). An experimental comparison of the understanding and use of speaker-addressee personal pronouns in autistic children. *British Journal of Disorders of Communication, 24,* 169-179.

Krantz, P.J., & McClannahan, L. (1993). Teaching children with autism to initiate to peers: Effects of a script-fading procedure. *Journal of Applied Behavioral Analysis, 26, 1,* 121-132.

Krantz, P. J., Zalenski, S., Hall, L.J., Fenske, E.C., & McClannahan, L.E. (1981). Teaching complex language to autistic children. *Analysis and Intervention in Developmental Disabilities, 1,* 259-297.

Landis, J.R., & Koch, G.G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33,* 159-174.

Lee, A., Hobson, R.P., & Chiat, S. (1994). I, you, me and autism: An Experimental study. *Journal of Autism and Developmental Disabilities, 24, 2,* 155-176.

Lovaas, O.I. (1961). Interaction between verbal and nonverbal behavior. *Child Development, 32,* 329-336.

Lovaas, O.I., Koegel, R., Simmons, J.Q., & Long, J.S. (1973). Some generalization and follow-up measures on autistic children in behavior therapy. *Journal of Applied Behavior Analysis, 6, 1,* 131-166.

Loveland, K.A. & Landry, S.H. (1986). Joint attention and language in autism and developmental language delay. *Journal of Autism and Developmental Disorders, 16, 3,* 335-349.

Matson, J.L. & Smith, K.R.M. (2008). Current status of intensive behavioral interventions for young children with autism and PDD-NOS. *Research in Autism Spectrum Disorders, 2,* 60-74.

O'Connor, I.M. & Klein, P.D. (2004). Exploration of strategies for facilitating the reading comprehension of high-functioning students with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 34, 2,* 115-127.

Odom, S.L., Brown, W.H., Frey, T., Karasu, N., Smith-canter, L.L., & Strain, P.S. (2003). Evidence-based practices for young children with autism: Contributions for single-subject design research. *Focus on Autism and Other Developmental Disabilities, 18, 3,* 166-175.

Ozand, P.T., Al-Odaib, A., Merza, H., & Al Harbi, S. (2003). Autism: a review. *Journal of Pediatric Neurology, 1, 2,* 55-67.

Pelios, L.V., & Lund, S.K. (2001). A selective overview of issues on classification, causation, and early intensive behavioral intervention for autism. *Behavior Modification, 25,* 678-697.

Silberg, J.L. (1978). The Development of pronoun usage in the psychotic child. *Journal of Autism and Childhood Schizophrenia, 8, 4,* 413-425.

Skinner, B.F. (1953). *Science and human behavior.* New York: Macmillan, Co.

Skinner, B.F. (1957). *Verbal behavior.* New York: Appleton-Century-Crofts.

Steege, M.W., Mace, F.C., Perry, L., & Longenecker, H. (2007). Applied behavior analysis: Beyond discrete trial teaching. *Psychology in the Schools, 44, 1,* 91-99.

Sundberg, M. L. & Michael, J. (2001). The benefits of Skinner's analysis of verbal behavior for children with autism. *Behavior Modification, 25*, 698-724.

Sundberg, M.L., & Partington, J.W. (1998). *Teaching language to children with autism or other developmental disabilities.* Pleasant Hill, CA: Behavior Analysts, Inc.

Van Houten, R., Axelrod, S., Bailey, J.S., Favell, J.E., Foxx, R.M., Iwata, B.A., & et al. (1988). The right to effective behavioral treatment. *Journal of Applied Behavior Analysis, 21, 4,* 381-384.

West, L., Waldrop, J., & Brunssen, S. (2009). Pharmacologic treatment for the core deficits and associated symptoms of autism in children. *Journal of Pediatric Health Care, 23, 2,* 75-89.

Williams, G., & Greer, R.D. (1993). A Comparison of verbal-behavior and linguistic-communication curricula for training developmentally delayed adolescents to acquire and maintain vocal speech. *Behaviorology, 1, 1,* 31-46.

APPENDIX A: IRB DOCUMENTATION

University and Medical Center Institutional Review Board
East Carolina University, 600 Moye Boulevard
1L-09 Brody Medical Sciences Bldg. • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb
Chair and Director of Biomedical IRB: L. Wiley Nifong, MD
Chair and Director of Behavioral and Social Science IRB: Susan L. McCammon, PhD

1907-2007
CENTENNIAL

TO: Albee Therese S. Ongsuco, BS, Psychology, ECU

FROM: UMCIRB

DATE: February 11, 2010

RE: Expedited Category Research Study

TITLE: "Pronoun Use Instruction within Verbal Behavior Analysis for a Child with Autism"

UMCIRB #10-0084

This research study has undergone review and approval using expedited review on 2/9/10. This research study is eligible for review under an expedited category number 7 (Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies). The Chairperson (or designee) deemed this **unfunded** study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **2/9/10** to **2/8/11**. The approval includes the following items:
- Internal Processing Form (dated 1/25/10)
- Consent Document
- Daily Observation Forms; App. A, B, C, D
- Summary Sheet; App. E
- Interobserver Agreement Form

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418
IRB00004973 East Carolina U IRB #4 (Behavioral/SS Summer) IORG0000418
Version 3-5-07

UMCIRB #10-0084
Page 1 of 1

APPENDIX B: DAILY OBSERVATION FORM: BASELINE

DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R P**
GOAL: Teaching MY and MINE   **SETTING: M   H**   **OBSERVER: 1   2**

CHECK IF COMPLETED	BEHAVIOR	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Ask K.H., "touch your _____"			
	Ask K.H. "whose ____ is it?"			

DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R P**
GOAL: Teaching YOUR and YOURS   **SETTING: M   H**   **OBSERVER: 1   2**

CHECK IF COMPLETED	BEHAVIOR	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Ask K.H., "touch my_____"			
	Ask K.H. "whose ____ is it?"			

DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R P**
GOAL: Teaching HIS and HIS   **SETTING: M   H**   **OBSERVER: 1   2**

CHECK IF COMPLETED	BEHAVIOR	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Ask K.H., "touch my _____"			
	Ask K.H. "whose ____ is it?"			

DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R P**
GOAL: Teaching HER and HERS   **SETTING: M   H**   **OBSERVER: 1   2**

CHECK IF COMPLETED	BEHAVIOR	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Ask K.H., "touch her _____"			
	Ask K.H. "whose ____ is it?"			

APPENDIX C: DAILY OBSERVATION FORM: TEXTUAL PROMPTS ONLY

TEXTUAL ONLY
DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T R P**
GOAL: Teaching MINE   **OBSERVER: 1   2**   **TRIAL: TRAIN   PROBE**

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE	PARTIAL CORRECT RESPONSE	INCORRECT RESPONSE
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch your _____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	Reinforce response of mine by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "READ THIS!". Provide textual prompt and reinforce the correct verbal response (Right! Or Great job! Or Here (and give preferred item))***				

Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL ONLY
DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T R P**
GOAL: Teaching YOURS   **OBSERVER: 1   2**   **TRIAL: TRAIN   PROBE**

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE	PARTIAL CORRECT RESPONSE	INCORRECT RESPONSE
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch my_____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	Reinforce response of yours by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "READ THIS!". Provide textual prompt and reinforce the correct verbal response (Right! Or Great job! Or Here (and give preferred item))***				

Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL ONLY
DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R   P**
GOAL: Teaching HIS   **OBSERVER: 1   2   TRIAL: TRAIN   PROBE**

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE	PARTIAL CORRECT RESPONSE	INCORRECT RESPONSE
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch his_____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	Reinforce response of his by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "READ THIS!". Provide textual prompt and reinforce the correct verbal response (Right! Or Great job! Or Here (and give preferred item))***				

Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL ONLY
DATE: **MATERIALS: C F T B O**   **PROGRAM IMPLEMENTER: T   R   P**
GOAL: Teaching HERS   **OBSERVER: 1   2   TRIAL: TRAIN   PROBE**

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE	PARTIAL CORRECT RESPONSE	INCORRECT RESPONSE
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch her_____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	Reinforce response of hers by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "READ THIS!". Provide textual prompt and reinforce the correct verbal response (Right! Or Great job! Or Here (and give preferred item))***				

APPENDIX D: DAILY OBSERVATION FORM: TEXTUAL AND ECHOIC PROMPTS

TEXTUAL and VERBAL

DATE: **MATERIALS: C   F   T   B   O**   **PROGRAM IMPLEMENTER: T   R   P**

GOAL: Teaching MINE   **SETTING: M   H**   **OBSERVER: 1   2**   **TRIAL: TRAIN   PROBE**

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch your _____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	If child responds with "IT's MINE", reinforce response by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "SAY THIS!" Provide *textual* prompt, and provide *verbal* prompt at the same time (e.g., "It's mine").				
	Reinforce the echoing of the prompt. (Right! Or Great job! Or Here (and give preferred item))***				
	Immediately after, REMOVE textual prompt and ask child again, "whose _____ is it?"				
	If child responds with "IT's MINE", reinforce response by saying anything BUT "Right, it's your cookie". If incorrect, do another trial with SAME object.				

Use card "It's mine" ONLY.   Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL and VERBAL

DATE: MATERIALS: C F T B O   PROGRAM IMPLEMENTER: T R P

GOAL: Teaching YOURS   SETTING: M   H   OBSERVER: 1 2   TRIAL: TRAIN   PROBE

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch my _____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	If child responds with "IT's YOURS", reinforce response by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "SAY THIS!" Provide *textual* prompt, and provide *verbal* prompt at the same time (e.g., "It's yours").				
	Reinforce the echoing of the prompt. (Right! Or Great job! Or Here (and give preferred item))***				
	Immediately after, REMOVE textual prompt and ask child again, "whose _____ is it?"				
	If child responds with "IT's YOURS", reinforce response by saying anything BUT "Right, it's your cookie". If incorrect, do another trial with SAME object.				

Use card "It's yours" ONLY.   Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL and VERBAL

DATE: MATERIALS: C   F   T   B   O   PROGRAM IMPLEMENTER: T   R   P

GOAL: Teaching HIS SETTING: M   H   OBSERVER: 1   2   TRIAL: TRAIN   PROBE

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch his _____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	If child responds with "IT's HIS", reinforce response by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "SAY THIS!" Provide *textual* prompt, and provide *verbal* prompt at the same time (e.g., "It's his").				
	Reinforce the echoing of the prompt. (Right! Or Great job! Or Here (and give preferred item))***				
	Immediately after, REMOVE textual prompt and ask child again, "whose _____ is it?"				
	If child responds with "IT's HIS", reinforce response by saying anything BUT "Right, it's your cookie". If incorrect, do another trial with SAME object.				

Use card "It's his" ONLY.   Don't use any pronouns when you praise or reinforce the child's correct response!

TEXTUAL and VERBAL

DATE: MATERIALS: C F T B O   PROGRAM IMPLEMENTER: T R P

GOAL: Teaching HERS   SETTING: M H   OBSERVER: 1 2   TRIAL: TRAIN   PROBE

CHECK IF COMPLETED	BEHAVIOR	TEXTUAL PROMPT USED?	COMPLETE CORRECT RESPONSE?	PARTIAL CORRECT RESPONSE?	INCORRECT RESPONSE?
	Select a stimulus clearly possessed by each individual (e.g., clothing, body part, etc.)				
	Ask the K.H., "touch her _____"				
	Reinforce correct responses				
	If incorrect, follow incorrect responses with correction procedure (physical prompting)				
	Ask K.H. "whose _____ is it?"				
	If child responds with "IT's HERS", reinforce response by saying anything BUT "Right, it's your cookie"				
	If incorrect, say, "no" or "nope", then say "SAY THIS!" Provide *textual* prompt, and provide *verbal* prompt at the same time (e.g., "It's his").				
	Reinforce the echoing of the prompt. (Right! Or Great job! Or Here (and give preferred item))***				
	Immediately after, REMOVE textual prompt and ask child again, "whose _____ is it?"				
	If child responds with "IT's HERS", reinforce response by saying anything BUT "Right, it's your cookie". If incorrect, do another trial with SAME object.				

Use card "It's hers" ONLY.   Don't use any pronouns when you praise or reinforce the child's correct response!

APPENDIX E: SUMMARY SHEET: BASELINE AND INTERVENTION

DATE	SESSION NUMBER	SETTING: O= OUTSIDE HOME H = HOME	STIMULUS SET: 1 = MINE 2 = YOURS 3 = HIS 4 = HERS	SESSION TYPE: P = PROBE T = TEACHING	PHASE: B = BASELINE T = TEXTUAL PROMPT ONLY TE = TEXTUAL AND VOCAL PROMPT	TOUCH... RESPONSES: 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	WHOSE_IS IT? RESPONSES: 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	PROMPT USED: T = TEXTUAL ONLY TE = TEXTUAL AND VOCAL PROMPT	WHOSE_IS IT RESPONSES: IN TE PHASE ONLY 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	INTERRATER TOUCH... RESPONSES 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	INTERRATER WHOSE_IS IT? RESPONSES 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	PROMPT USED 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	INTERRATER WHOSE_IS IT? RESPONSES 0 = INCORRECT 0.5 = PARTIAL 1 = COMPLETE	AGREEMENTS: 1 = Y 2 = N