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PARENTAL TRAINING AND PERFORMANCE FEEDBACK: IMPLICATIONS FOR IMPROVING EARLY LITERACY DEVELOPMENT IN PRESCHOOL CHILDREN

An Ed.S. Field Project

Presented to the

Department of Psychology

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Specialist in Education (Ed.S.)

University of Nebraska at Omaha

by

Karie J. Martin

May 2008

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THESIS (OR THESIS-EQUIVALENT PROJECT)
(OR EDS FIELD PROJECT) ACCEPTANCE

Acceptance for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree (Specialist in Education) University of Nebraska at Omaha.

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Chairperson Susan Kelly-Vance

Date 6/21/07

PARENTAL TRAINING AND PERFORMACE FEEDBACK:

IMPLICATIONS FOR IMPROVING EARLY LITERACY DEVELOPMENT

IN PRESCHOOL CHILDREN

Karie J. Martin, Ed.S.

University of Nebraska, 2008

Advisor: Lisa Kelly-Vance, Ph.D.

The purpose of this study was to compare different types of parent training for early literacy development. The participants were 14 caregiver/child combinations of preschool families enrolled in an area Head Start program. Caregivers completed questionnaires identifying early literacy practices at home. Literacy development for each child was examined using Rhyming and Alliteration assessment tools from *Get It! Got It! Go!* The early literacy activities were taken from *Ladders to Literacy: A Preschool Activity.* Visual analyses, percent non-overlapping data, effect sizes, and gain scores were used to evaluate each child's early literacy development across time. Results of the study show that both types of parent training techniques helped to improve early literacy development.

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Parental training and performance feedback:
Implications for improving early literacy skills in preschool children

Developing proficient reading skills is important for educational and life success. Because proficient reading is necessary for a child's future success, legislation has been passed to help children enter school ready to learn and to become proficient readers by the end of third grade (Goals 2000; *No Child Left Behind Act, 2002*). Young children typically begin to develop their reading skills through one-on-one early literacy activities with their parents and caregivers (Rush, 1999). According to Adams (1990) early literacy development can form through a variety of engaging activities such as talking about the environment, direct manipulation of letters, pointing out signs, computer time, singing nursery rhymes, educational television, and reading books. With literacy opportunities throughout a child's early years of development, many children will possess a sound literacy foundation to develop more complex reading skills without difficulty (Little & Box, 2002).

Even though it has been established that early literacy skills are important precursors for future success, countless numbers of children do not develop adequate reading skills. Specifically, the results of federally mandated reading assessments indicate that one in every four fourth grade student reads below the expected basic proficiency level (Good, Gruba, & Kaminski, 2002). One possible explanation for such high numbers of poor readers may lie in a child's early literacy development prior to formal reading instruction. Many children enter elementary school without engaging in sufficient early literacy activities (Notari-Syverson, O'Connor, & Vadasy, 1998). If

children enter formal reading instruction with limited early literacy experiences, they are at-risk for delayed reading development, develop complex reading skills at a slower rate, and may continue to make slower reading progress throughout their reading development (Good et al., 2002; Justice & Kadervek, 2004). As a result, a child may become frustrated with reading requirements (Haney & Hill, 2004), need additional reading support through supplemental programs or special education (Rush, 1999), and may eventually drop-out of school and engage in delinquent activities (Juel, 1988). Therefore, to help prevent reading difficulties and early school failure in at-risk children, prevention must be targeted at early literacy opportunities prior to entering formal schooling (Primavera, 2000).

One group considered "at-risk" for reading difficulties are children from economically disadvantaged backgrounds. Children from lower income environments tend to have fewer early literacy opportunities in comparison to children from more affluent backgrounds (Dodici, Draper, & Peterson, 2003). As a result, children growing up in low-income environments are reported as having lower levels of reading achievement and larger numbers of students placed in special education (Rush, 1999).

Although limited early literacy opportunities have been found in families from low-income backgrounds, parents from low-income backgrounds have reported that they care about their child's educational development and academic success (Primavera, 2000). Primary caregivers from low-income backgrounds may desire to help their children learn to read, but many do not have the necessary skills, resources, and confidence levels to engage in research supported early literacy activities (Little & Box,

2002). Early literacy research, conducted on preschool children and parents from low-income backgrounds, indicates that extra support given to parents can facilitate one-on-one early literacy opportunities (Whitehurst et al., 1994; Primavera, 2000). Therefore, to help promote proficient reading skills of children from economically disadvantaged backgrounds, educators may need to help primary caregivers increase the quantity and quality of early literacy interactions before the child enters school.

To have a better understanding of how to increase quality early literacy opportunities between primary caregivers and preschool children from low-income backgrounds, an examination of early literacy and parent training research will be provided. First, a break down of important early literacy skills and their relationship to preschool children and future reading success will be discussed. Second, early literacy research conducted on children from low-income backgrounds will be reviewed. Third, empirically-supported parent training strategies will be addressed. Finally, the benefits of supporting primary caregivers in increasing early literacy opportunities should become more evident.

Early Literacy Skills and Phonological Awareness

Early literacy skills are the pre-reading and writing skills that typically begin developing during the preschool years and are necessary for children to develop simple and more complex reading skills throughout their education (Justice & Kadervek, 2004). According to Notari-Syverson et al. (1998), early literacy skills can be categorized into three major areas: print/book awareness, metalinguistic awareness, and oral language.

First, print/book awareness is a child's understanding of meaningful symbols, pictures, alphabet letters, sounds representing letters, and writing (e.g., symbols, letters, and words). Second, metalinguistic awareness describes the ability to think about and manipulate various aspects of spoken language. Some of the elements involved in metalinguistic awareness include learning specific sounds that correspond to specific objects in the environment and that words and sentences are made up of a variety of components such as syllables. Finally, early literacy skills can be classified as elements of oral language. The area of oral language consists of the development of a child's vocabulary and narrative genre through conversation and story telling with other children and adults. All of these early literacy skills can be developed through indirect methods such as story book reading and more formal or direct activities like pointing out words on cereal boxes (Senechal & LeFevre, 2002). In addition, all three areas are important for the development of more complex communication, reading, and writing skills.

One particular early literacy skill, phonological awareness, has been given a substantial amount of attention for development of proficient reading skills. Phonological awareness is defined as an individual's understanding that spoken language can be broken down into smaller units and that these units can be manipulated. Specifically, spoken language can be broken down from larger components like sentences and whole words to the smaller units of speech like syllables and phonemes (Chard & Dickson, 1999).

For communication purposes, young children begin to focus on the individual sounds of words, communicated during adult/child interactions, to begin to understand

their world and produce forms of speech (Adams, 1990). The focus on these words is believed to occur as an implicit process, which is a process that takes place within the child and is not displayed overtly to others. As children develop their communication skills through interactions with adults, the individual sounds of spoken words become more automatic. As a result, a child can focus more of his or her attention on the meaning of the conversation instead of processing the individual sounds of each spoken word (McKnight, Lee, & Schowengerdt, 2001).

In a similar fashion, children must focus on phonological elements of spoken words in order to decode written words (Adams, 1990). This time, the child is required to explicitly or overtly identify the phonological aspects of the spoken words as they appear in writing. The task may be difficult as the child has already made the individual sounds of spoken words automatic for oral communication purposes and may not readily identify the individual sounds of words necessary to learn to read (Adams, Foorman, & Lundberg, 1998). Therefore, for children considered at-risk for future reading difficulties, it may be important to provide direct instruction to help them become more phonologically aware in an explicit manner (Justice & Kaderavek, 2004).

The Development of Phonological Awareness

Because phonological awareness is important for success in reading, parents and educators may be better able to support reading development by understanding how phonological awareness is developed. According to Chard & Dickson (1999), phonological awareness develops on a continuum from simple activities such as rhyming songs all the way to manipulating individual phonemes. Typically, preschool children

begin to express explicit phonological awareness through aspects of rhyming and alliteration. Rhyming is the understanding that two or more words end with the same sound (e.g., cat, bat, and hat). Alliteration is the detection of two or more words that begin with the same initial sound (e.g., saw, sick, save) (Ball, 1993). Parents and educators can facilitate the development of rhyming and alliteration by using engaging, age appropriate songs and games (e.g., Row, Row , Row Your Boat). Also, children can develop rhyming and alliteration skills through storybooks that directly focus on these phonological awareness skills (e.g., The Cat and the Hat by Dr. Seuss) (Adams et al., 1998; Notari-Syverson et al., 1998).

After children develop rhyming and alliteration skills, they begin to segment and blend words at the whole word, syllable, and onset-rime levels (Chard & Dickson, 1999). At the whole word level, a child begins to recognize that compound words can break apart into their original, smaller components (e.g., cowboy becomes cow and boy). In addition, a child must understand how two small words can combine to make a bigger, compound word (e.g., foot and ball becomes football).

Phonological awareness at the syllable level occurs when a child can detect rhythmic components of a word (e.g. happy becomes "ha^ppy"). Children demonstrate syllable components by clapping or tapping an object to the beats of the syllables. In addition, the child must be able to break the word into the discrete rhythmic components and put them together to make the whole word (e.g. "pump^ kin" becomes pumpkin) (Notari-Syverson et al., 1998).

Another phonological awareness skill is the ability to blend and segment at the onset-rime level. A child demonstrates onset-rime detection when he or she indicates that a word begins with an initial consonant or blend and ends in another sound beginning with the first vowel. For example, a child could detect that the word "brain" has the beginning sound /br/ and the ending sound /ein/. Learning to blend and segment words, syllables, and onset-rimes can be facilitated through play activities for instance puppets or guessing games that are engaging for a young child (Notari-Syverson et al., 1998).

Once a child can blend and segment words at the whole word, syllable, and onset-rime levels, he or she is ready to blend, segment, and manipulate phonemes. A phoneme is the smallest unit of speech that represents the letters of the alphabet (Adams, Foorman, Lundberg, & Beeler, 1998). Segmenting is defined as separating out the individual sounds of a word (e.g. hat is /h/a/t/). Blending is completed by identifying the individual sounds of a word and putting them back together into a whole word (e.g. /c/a/r/ is car) The manipulation of phonemes consists of deleting, substituting, and reversing the placements of phonemes (e.g., drop the "c" and add a "b", cat turns into bat) (Ball, 1993). By being able to blend, separate, and manipulate phonemes, a child is able to decode longer, more complex words allowing the child to read more challenging material (Adams, 1990).

Direct Instruction and Phonological Awareness

Because some children do not readily identify the phonological aspects of words for reading development it may be important to provide direct instruction (Justice & Kaderavek, 2004). According to Chard and Dickson (1999), children in preschool can

benefit from phonological instruction that incorporates fun and engaging activities addressing simple skills such as rhyming and alliteration. After young children have a strong foundation in these simple phonological skills, they may benefit from direct instruction in more complex areas (Adams, 1990).

Byrne and Fielding-Barnsley (1991) conducted a study in which direct instruction of phonological awareness skills was used with preschool children. In this study, the researchers provided direct instruction using a program called *Sound Foundations*. The *Sound Foundations* curriculum contained posters and card games focusing on various phonological awareness skills including rhyming and alliteration. The researchers spent approximately 30 min each week for 12 weeks providing direct instruction to the experimental group of preschool children. The control group did not receive any explicit instruction in phonological awareness. As a result, the experimental group outperformed the control group in all phonological awareness areas.

In follow-up studies by Byrne and Fielding-Barnsley (1993, 1995), the children from the original experimental group produced higher amounts of correctly read words and non-words, along with spelling more words correctly than children from the original control group. In addition, the children from the experimental group maintained superior decoding and reading comprehension results two to three years later. Similar, long-term results were discovered by Lundberg, Frost, and Peterson (1988) when six-year-olds were systemically provided explicit instruction in increasing complex phonological awareness skills and followed for two years. Therefore, direct instruction in phonological awareness

skills should help to promote a child's future reading success prior to formal reading instruction.

Children from Low-Income Environments and Early Literacy Development

Children from low-income environments may be more at-risk for future reading difficulties than children from more affluent backgrounds. Researchers have found that children raised in low-income environments have significantly lower reading achievement and higher rates of placement in special education (Rush, 1999). In addition, children from low-income backgrounds have demonstrated differences in literacy experiences as early as age four due to limited exposure to print and other literacy concepts in comparison to children raised in higher income homes (Smith & Dixon, 1995). A primary explanation for the differences may be found within adult and child interactions during a child's early years of development.

Parents in economically difficult situations often are struggling to provide the basic needs of their family members. The added economic stressors may influence the day-to-day interactions between the parent and child in both a qualitative and quantitative manner (Huebner, 2000). Specifically, children raised in economically disadvantaged homes receive more commands and fewer interactive communication opportunities than children living in financially stable homes. The communication differences are important because the communication opportunities are precursors to early literacy development (Hart & Risely, 1995). In addition to economic stressors, parents from low-income backgrounds may find it difficult to assist their young children in literacy development because they may be limited in their own literacy development, cannot obtain the

necessary resources, and/or do not have high levels of self-confidence to utilize provided resources and materials with their young children (Little & Box, 2002).

To help provide greater early literacy support to preschool children from low-income environments, some researchers have attempted to provide literacy support within Head Start programs. Head Start programs are federally created programs promoting education, health, nutrition, and parent involvement for children from economically disadvantaged backgrounds (U.S DHHS, 2007). The Head Start programs were developed to provide preschool age children an opportunity to enter formal educational settings at similar levels of experience as peers from higher income backgrounds.

Whitehurst et al. (1994) attempted to provide additional early literacy support to Head Start's existing curriculum. These researchers worked with parents and educators of local Head Start centers by training teachers and primary caregivers to read to the children using an engaging story- book reading technique called dialogic reading. The teachers read to children in small groups while the parents read to their child one-on-one. The purpose of the dialogic reading procedures was to encourage active participation throughout the story between the child and adult, instead of the child being a passive participant. In addition, the classroom teachers implemented phonemic awareness instruction from the program called *Sound Foundations*. The phonemic awareness instruction occurred within the context of an entire Head Start classroom and was applied to children in the small group, dialogic reading, and control groups.

Overall, the dialogic reading and phonemic awareness training made improvements in the child's early literacy skills. Children receiving the reading

intervention made significant gains in aspects of language development and print concepts incommensurate to the comparison group. In addition, when a child's parents were significantly involved in the one-on-one dialogic reading practices, the child made substantial vocabulary gains in comparison to other children in the experimental group. Another important discovery from this study was that the add-on literacy curriculum did not bring the Head Start children's literacy skills to a level that was comparable to the current U.S. national averages. Therefore, it was recommended that even more one-on-one literacy opportunities be provided to children from low-income backgrounds (Whitehurst et al., 1994).

A follow-up study by Whitehurst et al. (1999) indicated that the effects of the 1994 intervention did not generalize to the reading results at the end of first and second grade. Although these children made literacy gains (12th percentile to 40th percentile at the end of second grade), the children remained below typically developing children at both the national and local levels. Therefore, one solution to boost literacy development may be to increase the quality and quantity of one-on-one early literacy activities between parents and children from economically disadvantaged backgrounds.

Parental Involvement in Early Literacy Development

It has been demonstrated that preschool children can benefit from direct instruction in phonological awareness. In addition, the development of complex reading skills is easier when early literacy skills are established prior to formal reading instruction (Chard & Dickson, 1999). The research on early literacy development, however, notes that without an increase in one-on-one early literacy activities, children from low-income

backgrounds may not develop proficient reading skills even when support is provided within educational settings (Whitehurst et al., 1999). Therefore, it may be very beneficial for educators to support parents from low-income backgrounds with early literacy activities that they can implement at home in conjunction with the support received from the preschool setting.

At this time, there is limited research addressing effective techniques to use to train parents as interventionists in literacy development. However, considerable research has been conducted on strategies to support parents who have a child with behavioral concerns. According to McMahon and Forehand (2003) the following training techniques have been found effective when working with parents from a variety of backgrounds: support through modeling and role playing, provide homework assignments, give handouts, practice techniques before conducting them at home, provide direct feedback, mid-week phone call reminders of upcoming sessions, and actively including the child in the learning process.

In addition to these parent training strategies, elements of treatment integrity and progress monitoring also may help make significant, positive changes in a child's behaviors or academic skills (Noell et al., 2005; Witt, Noell, LaFleur, & Moretenson, 1997). Treatment integrity is defined as the number of steps accurately carried out following presentations of the intervention procedures (Noell, Witt, Gilberston, Ranier, & Freeland, 1997). Because the majority of interventions that are developed are carried out by a third party participants such as teachers and parents with varying degrees of knowledge and skill level, ensuring adequate treatment integrity within an intervention or

activity is essential (Sterling-Turner, Watson, & Moore, 2001; Sterling-Turner, Watson, Wildmon, Watkins, & Little, 2001). Also, progress monitoring, or the continual evaluation of change in behavior or skill as a result of an intervention, along with weekly follow-up procedures can influence the effectiveness of the intervention that is being implemented by an adult (Noell et al., 2005; Witt et al., 1997).

Researchers have begun to incorporate some of these parent training techniques to facilitate early literacy skill development in preschool children. During an eight-week program, Primavera (2000) trained parents to implement early literacy activities at home with their preschool children. The participants in this study were parents of children enrolled in a large Head Start center. A reading program entitled "The Adrienne Kirby Family Literacy Project" was used to help teach the parents more effective reading strategies. The training procedures encompassed role-playing, video presentations, discussion, and modeling techniques. In addition, more individualized opportunities to practice certain activities or a skill were made available. Parents were then provided homework assignments reviewing various concepts of skills or activities addressed during a weekly workshop.

To assess changes in parent and child early literacy skill development, researchers examined pre- and post-training questionnaires examining parental views of their own and their child's literacy practices, knowledge, and skills. Also, parents completed journal entries pertaining to the workshop instructors; teachers informally provided input on each child's early literacy development. By comparing pre-program and post-program

surveys, it was clear that parents felt empowered, and approached reading and literacy activities in a different, more effective manner at the completion of the program.

The post-test questionnaires results indicate that parents participated more in engaging storybook practices. Many of the parents increased the amount of time that they read to their children. Moreover, both parents and teachers expressed positive literacy changes in the children receiving the intervention. Approximately 50% of the children involved in the study had been reported as "significantly improved" by the teachers and parents. The results of this study provide support for direct training procedures to boost early literacy development for children from economically disadvantaged backgrounds. However, the results of this study are inconclusive as there are no objective measurements of each child's early literacy development.

McKnight et al. (2001) conducted an evaluation of parent training involving phonological awareness and reading aloud techniques with preschool children. The goals were to see if the home program could impact early literacy skill development. In addition, the researchers wanted to address the practical aspects (e.g., time, money, efforts, and outcomes) toward training parents with early literacy skill activities. There were two preschool children selected for the study based upon similar early literacy practices in the home and developmental levels. Multiple baseline procedures were implemented to identify a child's change in early literacy development based upon the parent training and subsequent delivery of activities.

The research team utilized *Ladders to Literacy* activities which focus on early literacy skill development for preschool children. Parents were then taught one to two

activities each week. The training consisted of descriptions and demonstrations of the various activities within the context of the child's home. Each training session took place once a week, and each session lasted approximately 30 min. Researchers provided all activity instructions in writing, and they allowed parents to contact them in case they had any questions pertaining to the activities. The children were then evaluated each week examining knowledge of letters, phoneme identification and segmentation, and letter/sound correspondence. Visual analysis was used to observe changes the children's progress across time. Also, treatment integrity measures were included. Specifically, parents were contacted to ask them questions concerning the implementation of the activities. Permanent products of the activities that were demonstrated during parent training (e.g., book with words beginning with the same sound) were examined along with follow-up surveys addressing implementation accuracy (McKnight et al., 2001).

The results of this study demonstrated that the children entered the study with substantial letter naming abilities; hence, they did not progress in this particular area. On the other hand, both children made considerable gains in the other three phonological awareness areas. In addition, parents reported that they conducted early literacy activities in a more engaging manner addressing specific components of sounds and words. No results were provided reporting the overall treatment integrity of the activities. Therefore, although promising results were found using direct training strategies, including information regarding treatment integrity may provide more concrete explanations explaining the positive changes in early literacy development.

Summary

The results of numerous studies demonstrate that a strong grounding in early literacy skill development may provide the necessary foundations needed for future proficient reading skills when obtained prior to formal reading instruction. In addition, the development of early literacy skills may be facilitated by quality, explicit instruction. (Byrne & Fielding-Barnsely, 1991, 1993, 1995; Lundberg et al., 1988; Senechal & LeFevre, 2002; McKnight et al., 2001; Juel, 1988). Many children from low-income families, however, enter formal educational settings with limited amounts of early literacy opportunities, which may place them at-risk for future reading difficulties (Justice & Kadervek, 2004). Parents from low-income backgrounds desire to help their children in academic and behavioral aspects that may benefit their children's educational development. Many, however, do not have the necessary resources, knowledge, availability, and/or self-confidence to provide the help that their children need without additional support (Little & Box, 2003; Haney & Hill, 2004).

At this time, research supports using direct training procedures to maximize intervention effectiveness when working with classroom teachers and parents (Primavera, 2000; McKnight et al., 2001; Noell et al., 1997). However, only a few studies have applied direct training procedures specifically to parents from low-income backgrounds. Also, literature examining evaluations of procedural integrity of intervention procedures is scarce. Furthermore, research using objective progress monitoring tools to evaluate a child's early literacy skill development as a result of parental training is incomplete.

Therefore, the present study attempted to expand upon previous early literacy literature by examining the question: Can direct parent training strategies designed to improve a preschool child's early literacy development increase quality, early literacy opportunities that occur in the child's home? Parents and guardians, with children enrolled in Head Start, were provided early literacy information and activities through direct training or written information forms. All preschool children involved in this study were assessed and monitored on their early literacy development. Additional measures to ensure procedural and parental integrity of the modeled and practiced procedures were implemented. Also, to identify potential changes in parent early literacy practices, a pre- and post-intervention early literacy questionnaire was administered.

The current research study expanded upon previous early literacy literature by comparing two types of parent training techniques (i.e., direct vs. written), and it added elements of treatment and procedural integrity. In addition, the present study contributed to early literacy research by using objective measures to progress monitor every child's early literacy development throughout the intervention. Furthermore, the present study focused on more formal literacy experiences that occur between a caregiver and child in the home. Based upon previous research findings, it was hypothesized that the direct training procedures used with parents from low-income backgrounds would facilitate early literacy skill development in their preschool children as a result of increased quality, at-home early literacy opportunities.

Method

Participants

The participants of this research project consisted of combinations of preschool children enrolled in Head Start and their accompanying caregivers. The preschool children were enrolled in a Head Start program located in a small, mid-western town. Also, the children were beginning their final year of preschool prior to entering an elementary school setting in the fall. To be eligible for participation, all children and caregivers had to meet the following inclusion requirements: English as the primary language; children could not receive special services that may influence rhyming and alliteration responses; and caregivers had to agree to participate and complete requirements of their assigned groups (e.g., attend all direct training sessions).

At the beginning of the research project, there were 18 caregiver/child combinations. Due to attrition and limited follow-through, only 14 of the 18 original combinations continued participation throughout the entirety of the project. The children's ages were between four years zero months and four years eleven months. Of the child participants, 13 were Caucasian and one child was African-American. The groups were closely balanced in gender and numbers. Both groups contained four girls and three boys.

In addition, two children received support services for speech and language development. Specifically, one child was assigned to the written information group and one was assigned to the direct training group. Both children had appropriate receptive and expressive abilities to participate in the research study. Although these two children met initial participatory requirements, their responses may be influenced due to the relationship of speech and language development and phonological awareness.

All of the parents came from a low-income environment because their annual income totals met current federal poverty guidelines. The federal poverty level at the time of the research project was $20,000 or below (National Center for Children in Poverty, 2003). The parent or primary caregiver was an adult that possessed custodial rights to the child including a biological parent, foster parent, or extended family member.

Demographic information was examined for all caregivers in both groups. All caregivers provided self-report information on demographic forms. All of the caregivers noted that they were either an average or great reader. Specifically, more than 57% of the caregivers reported being a great reader versus only 29% in the written information group. These self-report results may have been influenced by other factors such as educational levels and perspectives on what makes a great reader.

Moreover, there were significant differences between the dynamics of participants in the direct training and written information groups. The caregivers in the written group had more participants who were married (71% to 29%) and had higher levels of education (57% college graduates versus to 29%) in comparison to the participants in the direct training group. Although the groups were more evenly matched based on similar child demographics, the differences in caregiver demographics may have had influence on the overall outcomes of the project. A summary of caregiver demographic information can be found in Table 1.

Settings

All parent training meetings and child data collection were conducted in the Head Start center. The Head Start center contains classrooms and a conference room appropriate for child assessments and parent training procedures. The Head Start center had 84 center-based children, with an additional 41 children in combination and home-based classes. The majority of children from this Head Start center were Caucasian, however, 25% of the children were of different racial backgrounds. The Head Start center was selected because it was a familiar location to the children and parents. Also, the Head Start center was located within a 15 min drive from most housing locations. The center conducts other types of parental support meetings, such as policy council, in the evenings throughout the academic year. Because 20-25 parents typically participate in these activities but drop out over time, similar types of numbers and behaviors were expected throughout the literacy project.

Design

An A-B time series design was used to examine changes in each child's early literacy development and in the parents' home early literacy practices before and after the early literacy intervention has been implemented. To demonstrate greater experimental control, treatment integrity was addressed for early literacy skill demonstrations and parental practice of the procedures.

Independent Variable

The independent variable was the type of training (direct or written information) that the parents received.

Dependent Variables

There were two dependent variables that were examined throughout this research project. The first dependent variable was the rate of early literacy development that each child made on the rhyming and alliteration assessments. The second dependent variable was the amount of change in early literacy opportunities as reported by caregivers on the early literacy questionnaires.

Materials

The early literacy skill lessons were taken from *Ladders to Literacy*: *A Preschool Activity Book* by Notari-Syverson et al. (1998). According to the authors, the lessons depicted in *Ladders to Literacy* encompass early literacy skills such as print/book awareness, phonological awareness, and oral language. All of the lessons were created specifically for preschool children. In addition, all of the activities have been field-tested on culturally and ethnically diverse preschool children enrolled in a variety of learning environments, including Head Start programs. The early literacy lessons/activities have been created for use within the classroom with activities that can be carried out at home in connection to the classroom activities. Teachers can adjust the classroom activities based upon the level of adult support needed for small groups and individual children. *Ladders to Literacy* has been reported to be an effective literacy development program (Chard & Dickson, 1999; Justice & Kadervek, 2004; McKnight et al., 2001).

For the use of this study, six early literacy activities were selected on the topics of rhyming and alliteration. Specifically, there were three activities explicitly targeting rhyming (i.e., Nursery Rhymes, Rhyming Book, and Magic Password) and three that focused on alliteration (i.e., First Sound/Song, Sound Isolation, and First Sound Matching

Game). Each activity consisted of engaging adult/child interactions through play. A part of each of the activities was for the adult to explicitly point out the rhyming or alliteration component contained within the activity. In addition, each activity could be carried out within a 15-20 min time frame.

Measures

Child early literacy skill development. Rhyming and Alliteration assessment tools were used to examine each child's early literacy development. Specifically, the Rhyming and Alliteration assessments are classified as preschool Individual Growth and Development Indicators (IGDIs). IGDIs are general outcome measures that allow parents and educators to do the following: 1) identify a child's current performance level in a major developmental area, 2) pinpoint a child's rate of development, and 3) monitor progress and make adjustments (McConnell, Priest, Davis, & McEvoy, 2002).

The Rhyming and Alliteration assessment tools consist of multiple picture cards with a target picture and three non-target pictures (Missall & McConnell, 2004). On each card, there is only one correct non-target picture that corresponds to the target picture. The child was encouraged to name as many correct rhyming pictures that corresponded to the various target pictures within two minutes. Sample rhyming and alliteration cards can be found in Appendix A and Appendix B respectively.

The psychometric properties of the Rhyming assessment are sound (Missall & McConnell, 2004). The test-retest reliability of the scores was high (.83 to .89) when applied for three weeks on a preschool sample. Concurrent validity also was reported with the Test of Phonological Awareness (TOPA) 44-.62 and with DIBELS subtests of

Letter Naming Fluency (.48-.59) and Onset Recognition Fluency (.44-.68) when examining preschool children. Similar types of psychometric properties were established in the Alliteration assessment. Test-retest reliability scores range from .46-.80 on the Alliteration assessment. The Alliteration assessment correlated with TOPA and ranged from .75-.79, and has concurrent validity scores of .39-.71 with the DIBELS subtest of Letter Naming Fluency.

To help interpret a child's rhyming and alliteration scores, parents and educators can utilize the University of Minnesota website www.getgotgo.net. At this time, there are no established normative benchmarks for the rhyming and alliteration skills; however, caregivers and educators may use the Minneapolis, MN benchmarks which are estimated to be seven correct rhyming responses and five correct alliteration responses, in two minutes, by the start of kindergarten. In order to identify an estimated expected rate of growth for rhyming and alliteration, the primary researcher calculated what rates could be anticipated if a child began with zero correct responses and expected to reach the Minneapolis benchmarks (across 12 months). The estimated rate for both rhyming and alliteration was around .5 cards/month. Specifically, the expected rates of growth were .58/month for rhyming and .42/month for alliteration.

Procedural integrity. Modified treatment integrity checklists from Brown-Chidsey and Steege (2005) were created for each early literacy activity (see Appendix C). To report reliability levels, the primary investigator and a secondary researcher recorded the number of steps that the primary investigator correctly demonstrated to the parents for all six of the early literacy activities presented. Percentages of procedural integrity were

calculated by dividing the total number of steps for each early literacy activity that were presented and agreed upon by the total number of steps that each activity contained and multiplying by 100. By examining the procedural integrity of the demonstration of activity procedures the investigators were more certain that what was being taught during training was identical to what was being expected by the parents when they carried out the early literacy activities at home.

Parent treatment integrity. To provide parents with performance feedback throughout the direct training sessions, the researchers used the same procedural integrity checklists (Brown-Chidsey & Steege, 2005). As with the investigators, parents were evaluated for their inclusion of all the steps. Identical procedures were used to calculate the percentage of parental integrity. By ensuring adequate treatment integrity, the investigators could be confident that all of the parents have sufficient knowledge to engage in each early literacy activity in the manner that was demonstrated during training.

Early literacy questionnaire. Boudreau (2005) created an extensive early literacy questionnaire for parents. The questionnaire asked parents to report on their child's interaction with books, environmental print, alphabet knowledge, phonological awareness, and writing. A set of questions was directed at what parents do to facilitate early literacy development and had an internal consistency alpha level of .38. The internal consistency was low because the questions were addressing items that did not readily connect. Therefore, the author examined each question more thoroughly in isolation. For the focus of the current project, a shortened questionnaire following a

similar format to the Boudreau (2005) questionnaire was created to examine caregiver facilitation of early literacy activities at home (see Appendix D).

The questionnaires were used to examine changes in the types and frequencies of early literacy opportunities provided at home by the caregivers. At the end of the questionnaire, two information questions addressed the adult's current knowledge of early literacy and where they have received their early literacy information. The informational questions were inserted within the pre-intervention questionnaire to help indicate how much early literacy information participants already had prior to the start of the project.

The major portions of the questionnaire contained six primary questions pertaining to early literacy skills that parents can address with preschool children (i.e., letter identification, letter/sound correspondence, rhyming, alliteration, environmental print, and reading). Each question also addressed how often the early literacy skills were being engaged in the home. The internal consistency of the early literacy topics was .61. Caregivers were to complete the questionnaire by answering yes or no to engaging in each type of early literacy activity. In addition, caregivers were to report how often they engaged in the early literacy activities by circling the amount of time most representative of their actual practices. The frequency options were on a 1- to 4-point scale. The internal consistency of the "often" questions was .78.

Frequency and duration measures. Additional questions were used to assess the frequency, duration, and the types of early literacy activities that the caregivers were conducting at home. A member of the research team contacted the adult participants by

phone each week to ask how long each activity was being done and on which days of week the activities were being carried out. In addition, a research member asked each adult participant if they had any questions or concerns toward the early literacy activities that they were asked to carry out at home. This information provided additional explanations toward changes in parental practices and child early literacy development as a result of the type of training received.

Procedures

Experimenter training. During spring before the project was to begin, the primary researcher recruited assistants from a college located in the same community as the Head Start center. The on-site research team was composed of two undergraduate students and one B.A. level individual that have had education concerning research, assessments, and aspects working with children and families. Over the summer months, the on-site research team discussed time-lines of the project, reviewed the assessments and standardization components, and practiced collecting treatment integrity. The assistants also practiced collecting baseline and intervention data on each other and on volunteer children at a local day care center. Following these practices, the assistants were provided feedback and discussed any questions that they had pertaining to the assessments. A tour of the Head Start center and group discussions with the director also took place before the Head Start sessions had begun. In addition, all of the members of the on-site research team completed the required on-line IRB training.

To assist with parent contacts and resources, three additional team members were utilized at the primary researcher's current educational placement. These individuals also

completed IRB requirements, and had various levels of planning and discussion with the primary investigator. One research assistant was in charge of graphing each child's progress on the computer and conducting the frequency and duration contacts on a weekly basis.

Recruitment & Informed Consent. At the beginning of the school year, the primary research assistant introduced the study to teachers at the Head Start center. The teachers were asked to help promote the address the project with the caregivers of the children enrolled in their individual classes. Next, IRB approved fliers were posted in multiple locations throughout the Head Start building. Third, recruitment packages were consisting of a letter in support of the project by the Head Start director, summary information concerning the project, inclusion requirements of the study.

Forms addressing background and contact information were also included in the recruitment packages. Specifically, topics such as parent/primary caregiver's educational level, marital status, and employment status, reading levels and relationship to the child were inquired. Also, information addressing the preschool child's date of birth, allergies, and enrollment in special services were included within the demographic form A copy of the recruitment package was then sent home in every four-year-old child's school bag. Caregivers who were interested in participating in the project were given a one week time limit to return the contact/background information forms, in sealed envelopes, to the Head Start office.

After receiving all of the forms from interested caregivers, the primary research assistant began to review the forms to ensure that all interested adults and children met

inclusion criteria. The inclusion criteria included: both child and adult having English as their primary langue; the child did not receive support services that may interfere with the child's literacy responses/comprehension of instructions; and adults had to agree to participate in all sessions of their assigned groups.

Next, follow-up procedures were put into place. IRB approved adult/child consent forms were distributed to caregivers by classroom teachers placing the forms in the child's school bags. Addressed sealed envelopes were also provided so caregivers could return the forms, while maintaining privacy, to the center. In addition, a meeting between the primary researcher and the classroom teachers took place at the Head Start center. The teachers were asked to relay any concerns they might have pertaining to the participation of any interested caregivers. The Head Start director was also consulted concerning any identifiable concerns.

In order to assist families in understanding the project and consent pieces, the primary research assistant conducted each caregiver via a phone call. Caregivers were walked through aspects of the consent form, and they were offered an opportunity to come and attend a group forum at the center. The forum allowed caregivers to come and meet the research assistants in person, and ask additional questions pertaining to the project and consent.

After consent was obtained, the primary research assistant went back to the center to meet with some of the children who may be participants of the study, but were receiving services for speech related issues. A speech-pathologist employed by Head Start was also consulted for input concerning the participation of the children receiving

speech services. Following the follow-up procedures, all of the names of the interested caregiver/child combinations, that met inclusion criteria, were placed in a bowl, drawn, and randomly assigned to one of the two experimental conditions.

Child data collection. Following consent and random assignment procedures, all children participating in the research project were assessed for their development of both alliteration and rhyming skills. Prior to the start of the direct training sessions and the written information distributions, three baseline data points were collected using the Rhyming and Alliteration assessment tools. The baseline data points were collected on three separate days within a one-week period (i.e., Monday, Wednesday, and the following Monday). Following the start of the intervention, the child participants had their early literacy skills assessed on a weekly basis to monitor progress across time. The assessments were conducted on consecutive Wednesday mornings for eight weeks. The assessments occurred from 9:30-10:45 AM to allow time for all child participants to finish their snacks and morning routines. The primary investigator and trained research assistants collected baseline and intervention data. If a child was absent or was unable to be assessed on Wednesday, all efforts were made to conduct a make up assessment the following Monday morning, prior to next scheduled assessment session.

Direct training group. Parents placed into the direct training group met at the Head Start center for three evening meetings. These meetings were conducted on Thursday evenings from 6-8 p.m. To provide greater support to the parents, two evening sessions were held in consecutive weeks, with the third session occurring after a two-week delay. These procedures were to provide greater support to the parents at the

beginning of the project, and then allowing additional time for activities to be carried out at home without as much support. Providing caregivers with upfront support and gradual check-ups have been found to be effective when working with families on behavioral interventions with their children (McMahon & Forehand, 2003).

During the initial training meeting, the primary investigator discussed some of the major research on parental involvement and early literacy skills, along with a review of what would take place during the training sessions. Information on early literacy development was distributed for future reference. In addition, questions were answered concerning elements of the project. Pre-intervention questionnaires were also distributed at the beginning of the first direct training session.

For the initial and remaining two meetings, parents and accompanying children were provided with a meal. After the meal, preschool children and accompanying small children were supervised in a near by room. Then, the primary investigator presented the first of the early literacy activities to the group. The primary investigator presented the information to the entire group by role-playing with a research assistant or an older sibling of one of the child participants. Next, the caregivers were asked if they had any questions and answers were provided. Then, a research assistant recorded procedural integrity data during the activity presentations that occurred in front of the entire group.

The first week's activities that were introduced from *Ladders to Literacy* were "Nursery Rhymes" and "First Sound Song". For "Nursery Rhymes", the caregiver was to help the child recite or sing a familiar nursery rhyme of their choice. The nursery rhyme was to be repeated two to three times. To help the families to come up with familiar

nursery rhymes, six coloring pictures with portions of familiar nursery rhymes were obtained from www.niteowl.org and distributed.

The goals were for the caregiver and child to sing, interact, and post the pictures in a familiar location of their home or vehicle. That way the items could be revisited later on. Another goal was for the caregivers to help their children identify the rhyming words in the nursery rhymes. For the "Nursery Rhyme" activity, caregivers were encouraged to read or sing the nursery rhymes on multiple occasions and to point out the words that rhyme. Once children became stronger at the concept of rhyming, parents were asked to have the children pick at the words on their own. Also, caregivers were asked to hang the pictures up in a visible location (e.g., in their car, on the refrigerator) to revisit them as often as possible.

The second activity was called "First Sound Song". For this activity, the caregiver was to help the child come up with a simple word, try and identify the beginning sound, and then create silly sentences with words of the same beginning sound. An additional component that could be added was to sing the song "Old McDonald had a Farm" with the same beginning sounds as the words used in the created sentences. The sounds replace the animals and the animal sounds. For this activity, parents were asked to provide assistance in identifying the sounds until the child became successful at picking them out on their own. Then, caregivers could provide less adult support and allow the child to come up with the words and sounds on their own.

During the second training session, caregivers were introduced to the activities called "Rhyming Book" and "Sound Isolation". For the "Rhyming Book" activity,

caregivers were given a booklet, made by the primary investigator, in which a child would name a word and additional rhyming words. The caregiver and/or child could draw a picture next to each of the words. This activity could again be repeated over and over for various periods of time. The caregivers were instructed to point out what parts of the words were the rhyming components as they conducted the activity. Later, the child was to be given more freedom in identifying the rhyming words with less adult direction.

For "Sound Isolation", the caregiver and child were to select a familiar child's tune such as "Happy Birthday". Next, the song was to be sung with phoneme pairs (e.g., da, me, la) in place of the words to help the child understand the change in lyrics. Then, the pair was to sing the song using the same sound for the beginning of each actual word of the song (e.g. "Pappy Pirthday Po Pou"). Again, this activity could be repeated and conducted in a variety of settings. Caregivers were encouraged to help the child pick words and point out the beginning sounds being used. Less adult support was to be provided as the child developed the alliteration skill.

The final two activities were called "Magic Password" and "First Sound Matching Game". For the "Magic Password" activity, the caregiver was to engage in a playful time with their child and pretend that they could fly to the moon, visit the ocean, or another imaginary place. Next, the caregiver was to hold the child's toy and request the child provide a word that rhymed with a short word that the caregiver would say. The caregiver was instructed to provide as much support as needed to help the child feel success, and then encourage more independence as the activity became easier. Later, the

child could also come up with a word and have the caregiver produce a word that rhymes. To help this activity be more fun and full of play, caregivers were directed to do this activity while their child was engaged in pretend play of their own toys, otherwise it may become a forced upon activity and become frustrating to the child.

For the "First Sound Matching Game", the families were provided a set of picture index cards with 3-5 cards beginning with the same sound. Graduate students created the cards. The caregivers selected one card and then helped the child find the correct cards that begin with the same sound as the target card. Caregivers were provided directions to secure their child's initial success by helping the child place cards in the correct pile, by putting only a small number of cards out with many matching cards, and then increasing the number of distracter cards on the table. Caregivers were also encouraged to expand the current deck of cards by finding pictures from old magazines and other locations and create additional flash cards to be used. .

Following each activity presentation, the primary investigator and a research assistant had an adult/child combination practice the activity in front of them. During the first session, the practice was held between the caregiver and child tables within the large group. For the second and final sessions, caregivers and the preschool child practiced the activity in the child's classroom. A researcher would then mark a tally mark next to each required step that was provided to collect procedural integrity on each caregiver. Caregivers were allowed to use their copy of the activity to help them carry out all of the required steps. The researchers then provided the feedback and provided additional demonstrations and suggestions to each caregiver.

At times, behaviors of the children would interfere with the caregiver's ability to carry out all of the steps for each activity. When this occurred, the caregiver was told that this was expected due to the time of day and strategies were discussed between the assistant and the caregiver on how to make things more successful at home. In addition to the strategies previously addressed, caregivers were encouraged to do the activities during times when one-on-one interactions are high/low distractions and when the child is more awake. Overall, caregivers were encouraged to provide as much direct support that they could to make the activities successful. The caregivers were then instructed to gradually fade their support as the child became stronger. In addition, the child should be allowed to be the leader and have the caregiver guess words, match cards, etc.

Written information group. On the Monday following the first direct training session, the caregivers in the written information group received a copy of the identical two early literacy activities, resources, and additional written information that had been demonstrated to the direct training group at the evening sessions. The information included a brief early literacy background, and an encouragement to carry out the activities for approximately 15-20 min per day. The caregivers were also provided the pre-intervention questionnaire. The participants were asked to complete the questionnaire before moving forward through the additional pieces of information. The questionnaire was then returned to the Head Start center. On the Mondays following the final two direct training sessions, written information and supplies for the final four activities were sent home within each preschool child's school bag.

All adult participants. During the weeks of the intervention, the parents in both groups were contacted to report how often they were implementing the early literacy activities. A research assistant contacted each family by phone. If there was difficulty or no response from individuals, the primary investigator tried to reach the adult by letter in his or her child's school bag. During these contacts, the parents had an opportunity to discuss any barriers, questions, or concerns they had pertaining to the implementation of the activities.

Following the final child assessment, the adults in both groups were contacted to complete the post-intervention questionnaire. The post-questionnaire was identical to the pre-intervention questionnaire minus the two information questions at the end. The post-intervention questionnaire was sent home in the child's school bag and was to be returned to the Head Start facility.

Data analysis. Due to the small number of possible participants used for this research project, descriptive and single-subject design elements were used for data analysis. Single-subject designs are used in applied research areas in which smaller numbers of participants are being examined (Kazdin, 2001). To help identify characteristics that make up the experimental and comparison groups, percentages were calculated for each group's caregiver and child demographic information. Means were then calculated for group comparisons on the adult questionnaires responses and reported activity days and times.

To help identify individual and group differences based upon the type of training that a caregiver received visual analysis, effect sizes, percent non-overlapping data, and

gain scores were computed for each child participant's baseline and intervention responses. For visual analysis, individual graphs were created for each child's responses on the rhyming and alliteration assessments. Aim lines were also included within the graphs to represent the long-term goals for rhyming and alliteration development (www.getgotgo.net). The aim lines were developed by taking the expected rates of growth/month and graphing where each child should be in six weeks according to their median baseline points. Three data points for baseline and six data points representing the six intervention weeks were graphed. Children received a zero on the graph if they did not get any items correct or if they did not meet the established criteria during the sample items.

Effect size was calculated by taking the mean of each child's intervention phase minus the mean of the baseline phase divided by the standard deviation of the baseline. Busse and Rybski-Beaver (2000) (as cited in Bonner & Barnett, 2002) note effect sizes are considered to be a moderate improvement if they range from .4-1.0 and a larger improvement if they ranged from 1.01-3.

To calculate percent non-overlapping data (PND) one must take the highest data point in the baseline phase and draw a parallel line across the intervention phase. Next, each data point above the line is counted, divided by the total number of data points within the intervention phase, and multiplied by 100 (Bonner & Barnett, 2002). According to Busse and Rybski-Beaver (2000) (as cited in Bonner & Barnett), PND scores above 85% are considered large and 65%-85% are moderate. Percentages below 65% are considered to be low and somewhat ineffective.

A final calculation of intervention effectiveness is gain score. Gain scores compare the amount of change in behavior or skill from a pre-intervention to post-intervention phase of an experiment. Gain scores are found by subtracting the mean score of the baseline from the mean score of the intervention phase. Gain scores are again useful to identify how much progress each child has made following the intervention phase.

Results

The main research questions were: Will direct training procedures facilitate more early literacy opportunities, and will they facilitate higher rates of early literacy development for preschool children in the direct training group?

Child Outcomes

Visual Analysis. Each child's responses on the Rhyming and Alliteration assessments were recorded during the baseline and intervention sessions. All individual graphs can be examined in Figures 1 to 28. Overall, higher rhyming responses were produced in comparison to alliteration responses. Furthermore, many of the graphs indicate considerable fluctuation across the baseline and intervention phases from participants in both groups. The results from the visual graphs identify that five out of the seven children in the direct training group (see Figures 2, 3, & 5-7) and all seven children from the written information group (see Figures 8-14) met expected rates of rhyming development at the end of the six-week intervention.

In the direct training group, four out of seven participants already met or exceeded the Minneapolis kindergarten rhyming benchmarks of seven correct pictures in two min.

The same four children doubled or tripled their correct numbers of rhyming pictures when compared to their median baseline responses. One participant, D5, met expected goals by the end of the intervention phase (see Figure 5); however, the child's correct rhyming picture responses were still low. Participant D5 had been identified as receiving speech services. The participant also had immediate changes occurring at home that may have influenced the child's overall behaviors during the assessments.

Expected rhyming rates were not met by two of the direct training child participants. Participant D1's responses may have been influenced by behaviors (see Figure 1). The participant did extend above expected rhyming rates during three assessment sessions of the intervention phase. However, at the six-week observation, the participant's responses did not allow continuation beyond the required sample cards. Research assistant's had noted that participant D1 did exhibit off task behaviors during some of the assessment sessions. In addition, participant D4 also did not meet expected rhyming rates of development (see Figure 4). As reported by D4's parent, the child did not enjoy rhyming activities as much as the alliteration activities. Therefore, the child may have been engaging in less rhyming activities than other children in the project which may have influenced the child's overall rhyming development across time.

In the written information group, all seven children reached expected rhyming rates of development. In addition, two of the seven children have already met or exceeded the Minneapolis rhyming benchmarks expected by the beginning of kindergarten. Of the seven participants, five of the children made, overall, consistent positive progress with their rhyming skill development (see Figures 10-14). There were

two child participants that met expected goals at the end of the intervention, but they had higher response rates at the one-month observation (see Figures 8 & 9).

For the alliteration assessments, both groups had four out of seven child participants meet expected alliteration rates of development by the end of the intervention. In addition, there were three participants in each group that met or exceeded the Minneapolis kindergarten alliteration goal of five correct pictures/two min. Identical to the rhyming assessments, the alliteration assessments were recorded across the six-week intervention. In addition, expected rates of development were again examined comparing alliteration responses at the four week and six week sessions to the established aim line.

In the direct training group, two of the same participants that met rhyming goals also met expected alliteration goals (see Figures 16 & 17). Both of these participants also reached the Minneapolis kindergarten benchmark at the end of the intervention phase. An additional two children also met expected goals at the six-week session. Interestingly, these two participants did not meet expected goals for the rhyming assessments. These results were more expected for child participant D4 (see Figure 18), as the parent reported that the child enjoyed alliteration activities more than rhyming activities. The delay in speech development may also have influenced the responses produced by participant D5. On the six session of the intervention, participant D5 obtained a zero response (see Figure 19). However, the results from the visual analysis are somewhat unclear as participant D5 consistently met expected rates of development throughout the intervention phase of the project.

For the written information group, the four participants that met expected alliteration goals also met expected rhyming goals. Specifically, participants W4 and W5 met expected rates of development and the Minneapolis kindergarten goals in both rhyming and alliteration (see Figures 25-26). Participant W2 met the expected rates of development in both skills and the Minneapolis alliteration benchmarks by the end of the intervention (see Figure 23). Participant W7 met the expected rate of alliteration development but did not meet the Minneapolis benchmark by the end of the project (see Figure 28).

Of the children that did not meet expected alliteration rates, two children had met expected goals at the four-week session but did not maintain the positive progress at the end of the intervention (see Figures 22 & 27). In addition, speech services may have again influenced responses as participant W3 was not meeting expected progress at the four-week and six-week sessions (see Figure 24). Again, receiving speech services cannot be confirmed as the sole influence of the child's progress, as the participant reached expected rates of progress during the other four assessment sessions.

Baseline and Gain Scores. Overall, there were similar group averages from the direct training and written information participants on the rhyming and alliteration assessments. For rhyming, the direct training group produced a slightly lower baseline average. However, the direct training group produced slightly higher average intervention responses and gain scores. Although the direct training group's responses in the intervention phase and gain scores were slightly higher, there was not enough of a difference to determine that the direct training procedures were superior to the written

information techniques. A summary of the baseline, intervention averages, and gain scores for the rhyming assessments can be found in Table 2.

For alliteration, similar results were produced. During the alliteration assessments, the written information group had a lower baseline average than the direct training group. Further examination of alliteration assessments indicated that both groups produced identical intervention averages, and similar gain scores. A summary of the alliteration baseline, intervention averages, and gain scores can be located in Table 3.

Effect Size. Effect sizes provide additional descriptive support to visual analysis, but they may be influenced by extreme fluctuation of data points in the baseline and intervention phases. Effect sizes for rhyming were calculated for six out of the seven children in the direct training group. In addition, effect sizes were computed for six out of seven children in the written information group. A summary of all rhyming responses of individual children and group averages can be found in Table 2.

For the rhyming assessments, the direct training group produced higher effect sizes with five participant responses in the large range and one in the moderate range. The written information group had three out of six participants with large effect sizes along with one participant in the moderate range. One child participant in each group was considered an outlier when examining the effect sizes. Participant D1 had an effect size of 7.45, which is more than twice what is expected as an effect size in the large range. In addition, participant W7 had a negative effect size of -.68. When removing these two participant scores from the average effect sizes of both groups, the groups become more similar in their effect size comparisons. Specifically, the direct training

group became a 1.63 and the written information group became a 1.50. Therefore, both groups produced similar effect sizes that are considered in the large range.

For the alliteration assessments, the direct training group again produced higher effect sizes. This time, there were two direct training participants in the large range and two in the moderate range. The written information group had one participant in the large range. The results of the effect sizes must be interpreted with caution due to the limited stability in the baseline and intervention phases. A summary of the alliteration effect sizes can be found in Table 3.

Percent of Non-overlapping Data (PND). PND was calculated for participants in the direct training and written information groups for the rhyming and alliteration skills. PND uses the highest data point in the baseline phase to identify a percentage of intervention data points that go above responses of what a child can already do without additional support through an established intervention. PND is an additional method of explaining changes that have occurred do to an intervention.

For the rhyming assessments, the direct training group and the written information group had two participants in the moderate range. The remaining participants in both groups were considered to be in a non-significant range. Overall, both groups fell in the low significance category, but they had very similar PNDs. Table 2 summarizes the PNDs from the rhyming assessments for both groups. For alliteration, the direct training group had one participant in the moderate range. The written information group did not have anyone in the moderate or large ranges. Both groups produced very similar PNDs.

The PNDs were lower than the group PNDs for the rhyming assessments. The alliteration PNDs are summarized in Table 3.

Overall Child Data Summary. By examining the visual analysis, gain scores, effect sizes, and percent non-overlapping data, an overall conclusion can be made concerning the development of rhyming and alliteration skills. The majority of children in both groups had greater success with the rhyming versus alliteration assessments. Also, both groups produced very similar outcomes in data pieces when outliers were extracted from the calculations. Overall, there were no sufficient differences between the two groups to consider one technique superior to the other. However, positive changes in both groups did occur on both rhyming and alliteration skills. These results occurred even though there were initial differences in the family dynamics of the two groups. Therefore, using both types of training may be helpful, under different types of circumstances, to produce positive results for future reading success.

Integrity Elements of the Direct Training Procedures

Procedural and caregiver treatment integrity pieces were examined during the direct training activities. The integrity results may provide explanations as to why the children in both experimental conditions had similar rhyming and alliteration outcomes. For the presentation of activity steps, there was 97.6% agreement, with a range of 90% to 100%. Therefore, caregivers were appropriately evaluated on almost all of the steps that were demonstrated to them on the six early literacy activities. As well, the activity components for the completed activities were carried out with an average of 87% accuracy, with a range from 75% to 100%. At times, children did not want to practice the

activities with their adult caregivers as they displayed a variety of behaviors (e.g., put head on table, did not comply with parent directions, run around the classroom). Sessions were completed around 8:00 PM, which was a time close to bedtime for many of the preschool age children. Therefore, percentages of caregiver integrity could only be computed from a 20% sample of the six activities practiced by the seven adult and child combinations during the direct training sessions.

Weekly Responses for Early Literacy Activities

To help provide additional explanations to the child rhyming and alliteration responses, adult participants of both parent-training groups were contacted weekly throughout the intervention phase. The adults were asked what types of rhyming and alliteration activities they were engaging in, along with the dates and amounts of time that each activity took place. A summary of the individual and group averages of the numbers of minutes that were devoted to early literacy activities each week can be found in Table 4.

Information received from the adult participants indicated that the majority of participants tried to engage in both rhyming and alliteration activities each week. There were also weeks during the intervention phase that children became sick or that the activities could not be completed. Table 4 identifies that caregivers in both groups were not always able to complete the literacy activities for 15-20 min. each day. Caregivers also reported that they did not always spend the entire amount of time on the activities, but that they also read to their child during some of that time. Interestingly, children receiving more engaged time each week did not always meet expected rhyming and

alliteration goals. Overall, similar durations of time spent engaged in early literacy activities were reported by caregivers in both groups throughout the intervention.

Early Literacy Questionnaire Responses

The early literacy questionnaires were used to help provide additional information for possible initial differences of early literacy engagement between adults in the two experimental conditions. Also, possible changes in early literacy opportunities were examined within each group and between the groups at the end of the project. These results helped to identify if one type of parent training technique was more effective than the other. Pre-intervention questionnaires were distributed prior to the beginning of the intervention phase of the project. Post-intervention questionnaires were distributed to all adult participants remaining in the project until completion.

Pre-intervention Questionnaire Responses. A return rate of 100% occurred on the pre-intervention questionnaires. The 18 caregivers that participated at the beginning of the project completed the pre-intervention questionnaires. Specifically, there were eight questionnaires completed by the direct training participants and 10 questionnaires completed by the written information participants. Overall, there were more adults in the written information group that reported knowing a lot about early literacy development. The written information participants also learned about early literacy development from seven out of the eight possible resources in comparison to three resources reported by the direct training group. Also, the category of teachers/educators was the resource category reported as the one most used to obtain information on early literacy development by

participants in both groups. A summary of the early literacy knowledge and resource information is summarized in Table 5.

Along with the resource and information questions, percentages were computed for the number of participants in each group engaging in the six designated early literacy activities. In addition, averages of each groups' reported times of how often they engaged in the activities were calculated. Overall, both groups reported reading to their preschool child as the early literacy activity that occurred most often. Reading at home was the only statistically significant difference between the groups t (16) = -2.31, p = .035. The results indicate that the written information group was reading more frequently to their preschool children than the adults in the direct training group. However, the significant difference may be have occurred due to the small number of participants in each group as the means and standard deviations were similar (see Table 5).

The responses provided by the adult participants also demonstrated that fewer participants in the direct training group were engaging in certain early literacy activities in comparison to the written information group. In the areas of rhyme instruction and initial sound identification, only 50% of the participants in the direct training group were engaging in these activities. On the other hand, of the written information participants, 90% were engaging in rhyming while 80% were engaging in initial sound identification activities. A summary of the pre-intervention responses by the direct training and written information groups is found in Table 6.

Post-intervention Questionnaire Responses. Identical activity questions were presented to all remaining adult participants at the end of the project. Participants

completing and returning the post-intervention questionnaires included three participants in the direct training group and five from the written information group. Questionnaires were not individually coded to identify individual changes by participants in each group. Therefore, the results may not be completely representative of the changes in early literacy practices before and after the project. From the information that was received, both groups reported increases in the types of early literacy activities being engaged in and the numbers of opportunities to engage in the activities. The written information group did report working more on letter names and rhyming activities in comparison to the direct training group. Although there were statistically significant differences on these two activities, both groups made similar positive changes for rhyming and letter names. A summary of the pre- and post-intervention averages can be found in Table 6.

Discussion

This study was an A-B time series design examining differences in early literacy development as a result of parent training techniques. It was hypothesized that direct training procedures would facilitate higher rates of early literacy development and increased early literacy opportunities at home. Overall, the direct training procedures did not significantly increase early literacy opportunities and development when compared to the written information procedures and responses. The results show that similar changes occurred by participants in both groups. On the other hand, pre-existing differences in the make-up of the families (i.e., education levels and marital status) may in fact support the use of direct training procedures when additional early literacy support is needed.

Because the direct training participants had, on average, lower educational levels, they may not have had the same opportunities to be exposed to information concerning early literacy development. The limited exposure can be confirmed by the pre-intervention questionnaire reports of limited types of early literacy knowledge and resources used. In addition, there were more caregivers independently raising their children in the direct training group than in the written information group. Having less adult support in a family may influence the early literacy opportunities that are provided and place a limitation on the knowledge and resources that a caregiver can obtain. These types of issues have been identified as concerns for caregivers from economically disadvantaged backgrounds (Little & Box, 2002).

Providing the direct training techniques may have helped to equalize the educational and adult support differences between participants in the parent training groups. Free childcare and meals were provided allowing the direct training caregivers opportunities to ask questions and practice techniques that they might not have been able to do in other settings. Participants were also provided individualized feedback. Next, they had opportunities to learn about early literacy activities through demonstrations and discussions with peers. The direct training techniques and assistance may have helped participants access resources. Also, they may have helped to build the confidence levels of the participants so that they could try and carry out the activities on their own. These conclusions may be supported by the similar trends in time and activities that were carried out each week by the caregivers in both groups.

In addition to the direct training techniques, there are other possible explanations for the similar early literacy development by the children in both groups. First, the treatment phase of the project consisted of only six weeks total. The short amount of intervention time for the actual study may have limited the overall rate of development, regardless of an increase in opportunities by the caregivers. This fact can be supported by the low expected rates of development, specifically .58 card/month growth in rhyming and .42 card/month growth expected in alliteration. In addition, the Head Start teachers noted that there was no formal instruction in rhyming or alliteration activities until the project was completed. Therefore, the children would have had similar rates of early literacy development unless they were receiving instruction at home.

Also, the children that made substantial growth in rhyming (i.e., D-3, D-5, & W-5) had already entered the project with higher levels of rhyming development compared to other children when examining their highest baseline responses (see Figures 3, 5,& 12). In addition, two of these children (i.e., D-3 & W-5) also met Minneapolis benchmarks in alliteration (see Figures 17 & 26). It is possible that these children's strong early literacy foundations in rhyming helped to boost them to even higher rhyming rates of development and helped them to begin to succeed at alliteration as well. Had the treatment phase of the project been extended, it is possible that even more children would have met expected rates of development in both skills.

Another possible reason for the similar levels of development may be due to the behaviors displayed during the direct training procedures. The direct training children expressed many behaviors during the evening sessions that prevented full completion of

some of the activities. Without being able to completely walk through all of the activities, the caregivers may not have come up with questions to ask concerning specific steps of the activities. They would have also missed out on obtaining positive and constructive feedback from the researchers. Therefore, at times, parents in both groups would have to rely more heavily on the written information pieces of the project, which may have produced similar types of intervention effectiveness.

The ease of the activities may have also influenced similar early literacy rates of development. The activities selected were used because they would be able to be carried out in a short amount of time and during typical family activities. The activities may have been easy enough to carry out without the direct training techniques. Therefore, significant differences may not have been impacted based upon the type of parent training received.

Although the family dynamics of the groups were different, the families did encounter similar life obstacles that may have influenced their ability to carry out the early literacy activities. Elements such as child illnesses and outside activities were reported by participants in both groups during the weekly contacts. When these events occurred, there were more caregiver reports of reductions in activities or no early literacy activities taking place. These elements may also help to explain the similar trends in weekly duration averages of the early literacy activities engaged at home by the two groups.

There were some statistically significant changes identified between the groups on the pre- and post-intervention questionnaires. However, the significant changes may be

explained by the individuals who completed and returned the questionnaires. There were more written information caregivers returning the post-intervention questionnaires than direct training caregivers. With the small numbers of participants responding, individual responses could be skewing the group averages. It is unlikely that there are true significant differences between the groups on the acquisition of the early literacy skills because the weekly group averages of early literacy duration were almost identical. Also, both groups reported similar mixes of the rhyming and alliteration activities that were carried out each week. Therefore, the significant changes appear to be more statistically based than actual changes due to the parent techniques.

Overall, there are a variety of factors influencing similar early literacy opportunities and development of rhyming and alliteration skills by the adult/child combinations of both groups. Regardless of the similarities, many children in both groups made positive gains in early literacy development. Furthermore, more caregivers are now equipped with resources and knowledge to help continue support early literacy development through increased early literacy opportunities at home. These changes occurred even when the family dynamics were different and different levels of support were provided.

Connections to Previous Research Studies

The current research project supports previous research conducted on early literacy and economically disadvantaged families. First, similar to Little and Box (2002) and Haney and Hill (2004), caregivers from economically disadvantaged backgrounds want to help their children develop early literacy skills. These families may find it

difficult to help their children development early literacy skills with limited early literacy knowledge, resources, and self-confidence. At the beginning of the project, there were so many individuals wanting to participate that some had to be turned away due to time constraints and resources.

Also, the results of the knowledge and information questions on the pre-intervention questionnaires indicated that many parents from economically disadvantaged backgrounds are not obtaining a lot of information on early literacy development until their child is receiving educational services. One participant even noted that the project was the first time he/she had learned about early literacy development. Interestingly, the majority of caregivers reported reading to their children on an almost daily basis. However, many of the children's rhyming and alliteration skills were very low. Therefore, more needs to be done to equip families with additional early literacy information and resources.

Additional evidence supporting the parents' desire to help comes from the participation of the direct training caregivers. From the initial direct training participants, only one combination did not come to all three direct training sessions. The participant was removed because the time could not be made up due to her child's extended illness. In addition, one parent did not have her own car. However, she managed to find a way to get to all three sessions. The families came even though each had significant obstacles to over come.

This study also supports previous literature that children from economically disadvantaged backgrounds need more phonological awareness support during the

preschool years to begin school at comparable levels of students the same age (Justice & Kadervek, 2004; Rush, 1999; Whitehurst et al., 1994; and Whitehurst et al., 1998). The majority of children in both groups began this project with low levels of rhyming and alliteration. The results of the study support positive growth for many children, but many are still developing below expected goals. In conjunction, the caregivers are trying to implement the activities as often as they can. However, there may be variables influencing how much early literacy opportunities the caregivers can provide in comparison to caregivers with more available resources. Therefore, even more early literacy support may need to be provided to families from economically disadvantaged backgrounds.

Conversely, the current study did not support previous studies demonstrating high levels of phonological skill development in preschool age children. In the Byrne and Fielding-Barnsley study (1991) the child participants were provided extensive phonological awareness instruction directly by the researchers and for 12 weeks. In addition, there was a control group that received no phonological instruction to compare their results too. The present study was shorter, activities were provided by caregivers only, and all participants had the opportunity to engage in rhyming and alliteration activities. In the same way, the participants in the Lundberg et al. (1988) study provided direct phonological training to children, and the children were six-years-old in comparison to the four-year-olds in the current study.

Furthermore, the present study did not support previous studies demonstrating early literacy development of children of economically disadvantaged backgrounds. In

Primavera (2000), caregivers were trained in a reading program to use at home with their preschool children who were enrolled in an area Head Start program. Role modeling, performance feedback, and videos were used to train the caregivers. Positive results were provided by subjective methods. Teachers noted early literacy improvements of various students, and parents provided positive input to the researchers through pre- and post-intervention surveys. No objective techniques were reported, and no comparison group was used. For the present study, a combination of subjective and objective data was collected to help provide concrete results. In addition, a comparison group instead of a control group was used.

Finally, this study does not support previous work facilitating improved intervention results through direct training procedures. McKnight et al. (2001) provided instruction to two children using activities from *Ladders to Literacy*. They provided direct instruction to the families, and monitored the integrity of the activities through finished products. They also went into each family's homes to support the early literacy activities. Although they found positive changes in the early literacy skills of their two child participants, it was not noted that the children came from economically disadvantaged backgrounds. Therefore, the obstacles facing the families in the previous study and the current study may have been very different which would influence the ability to perform the early literacy activities.

Limitations to the Present Study

There are multiple areas of limitation to this study. First, due to resources, time, and attrition, there were only a small number of participants. It may have been more

beneficial to apply these different training techniques on a larger sample size. In addition, results from a smaller sample size are more difficult to generalize to other situations. However, the smaller number of participants is representative of many educational and applied research activities.

Another factor influencing the results of the study is the amount of time for the entire project. Different results may have been found if a longer baseline could have been implemented. There was fluctuation in the majority of each child's baseline scores, which had direct influence on the statistical analyses being conducted. Also, previous research supported interventions ranging from eight to 12 weeks long. A longer intervention phase may have shown greater amounts of positive development across time.

A third factor of limitation was the amount of activities being addressed for two skills to be developed. Because there were only three direct training sessions, there was a great amount of constraint towards the amount of time that could be devoted to new and previously learned activities. No follow up procedures were incorporated within the project to check how well families did understand previously taught activities. In part, more of these activities may have been implemented with the support of additional assistance.

Fourth, there may have been elements of selection bias with the participants in the study. Many of the caregivers participating in the project are also involved as parent representatives for their child's classroom at the Head Start center. The Head Start teachers also reported that these families would potentially be active participants in the project through its entirety. Therefore, the participants involved in the project, through

completion, may not fully represent caregivers from economically disadvantaged backgrounds.

Finally, having caregivers try and develop two early literacy activities at the same time may have taken away some of the solid development of one skill. Because so many children were low on both skills, it may have been more effective to focus on rhyming only. That way the children could have been provided large opportunities for one skill instead of dividing the time up between both. Focusing on one skill may have also produced differences in the results of both visual analyses and accompanying statistical analyses.

Future Directions

Although the present study did not find statistically significant differences in early literacy development and opportunities, the findings do help to guide future directions of early literacy research. First, it would be helpful to identify differences in early literacy activities and opportunities by obtaining reports from caregivers of economically disadvantaged backgrounds and more affluent families. Along the same lines, it would be interesting to conduct the same type of direct parent training activities used in the current study to compare early literacy development between economically disadvantaged and affluent children. These comparisons may help to provide greater support for early literacy interventions at even younger ages. The information may also direct educators as to what types of early literacy activities to be presenting to families.

Next, researchers should begin to examine the effects of early literacy development on children who are very young (birth-age three). Previous researchers

suggest that differences in language development and world experiences are already happening in families of different economic backgrounds (Hart & Risely, 1995). Dodici et al. (2003) reported that there is a difference in parent/child interactions occurring between families of low-income backgrounds and families with more financial resources. As a result, these interactions are having a direct influence on the development of early literacy skills. Therefore, it may be beneficial to help facilitate early literacy development by focusing on parent-child interactions with families of economically disadvantaged backgrounds.

A final recommendation would be to provide greater support for early literacy development when a child is in a program like Head Start. During the current study, it was discovered that rhyming was not going to be addressed in the classrooms until late November, approximately the same time as the end of the study. If families have limited amounts of early literacy knowledge and resources and the caregivers' ability to provide extra support is limited, then educators may need to place greater emphasis on these skills much earlier in their educational year. Providing more intensive one-on-one early literacy instruction may also be beneficial within the classroom.

Conclusions

The current study examined different parent training techniques to help facilitate early literacy development. Although significant differences in the techniques were not identified, providing families with resources and information did produce positive changes. Different types of parent training techniques may help to provide early literacy support to families. However, providing information in written form may be sufficient

and more cost effective. Direct training procedures may be helpful to caregivers when written information tools are not producing expected results in early literacy development. Altogether, more of these types of activities may need to occur at earlier points in time so that all children, regardless of economic background and family make-up, can enter school ready to learn and enjoy reading.

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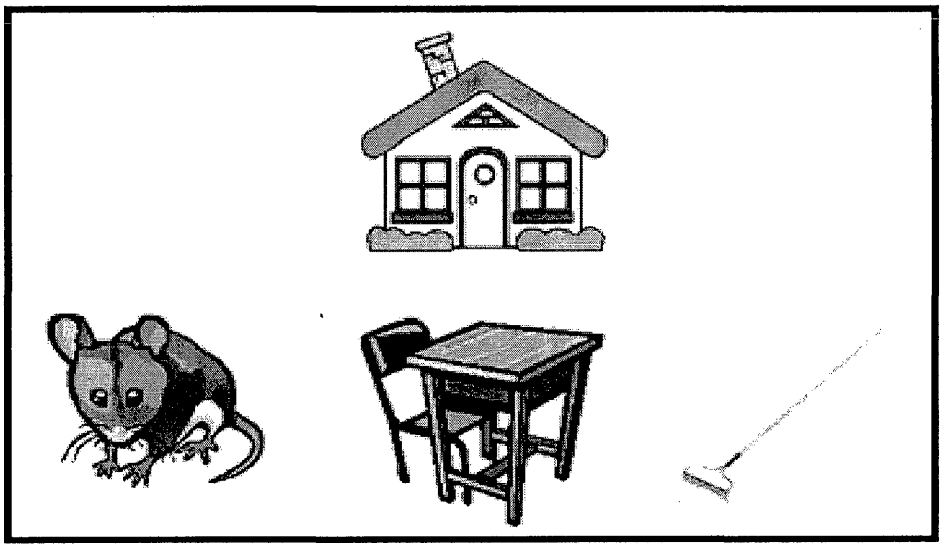
Appendix A

Sample Rhyming Stimulus Card from Get It! Got It! Go!



Front

house

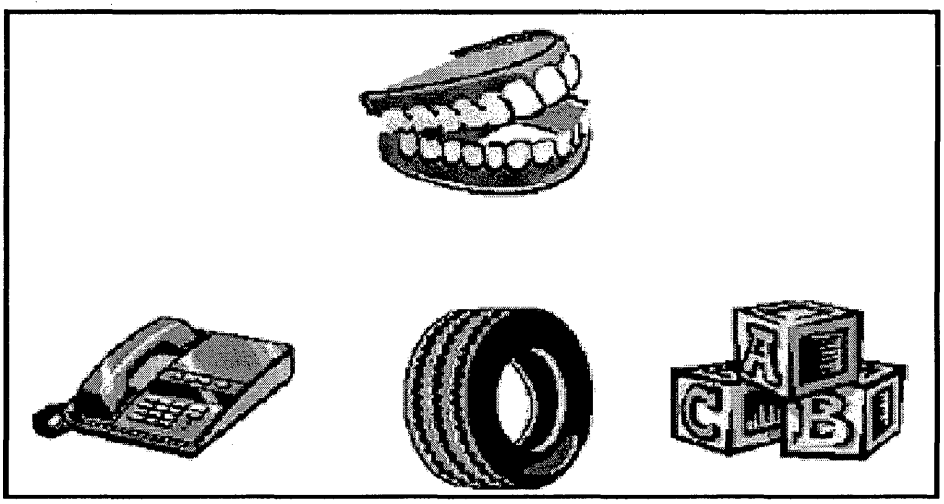
rake desk mouse

Back

Appendix B

Sample Alliteration Stimulus Card (from Get It! Got It! Go!)

Front



Back

teeth

blocks tire phone

Appendix C

Treatment Integrity Checklist
(Modified from Brown-Chidsey & Steege 2005)

Activity Title Nursery Rhymes **Number** 1

Date_____ **Evaluator**_____

Procedural Integrity_____ **Parent Integrity**_____

Intervention Components	Completed (circle yes or no)	Comments
Select Nursery Rhyme (Story or Song)	YES NO	
Read or Sing 1-3 times (or more)	YES NO	
Have child read, sing, or say parts of the story or song with you	YES NO	
Praise your child & Have Fun!	YES NO	
Color or draw a picture that goes with the song/story	YES NO	
Hang picture in visible location to review & discuss (e.g. car dashboard, mirror, fridge)	YES NO	
Repeat steps with other rhymes/songs	YES NO	
	Total YES=	
	Total NO=	

***General Feedback*:**

Appendix D

Parent Early Literacy Practices At Home

Pre-Intervention Questionnaire Group:

1. Is your child being taught letter names at home? Yes_____ No_____
a. How often are letter names taught at home?
Rarely On occasion Weekly Daily Other_____

2. Is your child being taught the sounds of letters at home (e.g. the letter S sounds like sss)? Yes____ No_____
a. How often is your child being taught the sounds of letters?
Rarely On occasion Weekly Daily Other_____

3. Is your child encouraged to rhyme words at home (e.g., cat rhymes with bat)?
Yes_____ No_____
a. Approximately how often is your child encouraged to rhyme words?
Rarely On occasion Weekly Daily Other_____

4. Is your child encouraged to identify words that begin with the same sound (e.g., hit, horse, hook)? Yes_____ No_____

a. Approximately how often is your child encouraged to identify words that begin with the same sound?
Rarely On occasion Weekly Daily Other_____

5. Do you and your child talk about print in the environment (e.g., The golden M is for McDonalds, That sign says "STOP" and starts with S)? Yes_____ No_____
a. Approximately how often do you and your child talk about print in the environment?
Rarely On occasion Weekly Daily Other_____

6. Is your child read to at home? Yes_____ No_____

a. Approximately how often is your child being read to at home?
Rarely On Occasion Weekly Daily Other_____

Information Questions

Appendix D Continued

A. What do you know about early literacy development? (*If you do not know information, that is okay.)*

B. Where did you receive your information about early literacy development? (Please circle all that apply)

Doctor/Pediatrician Library staff Books/Magazines Television
Family/Friends Teachers/Educators Computers

No information received Other_____

Table 1

Demographic Characteristics of Primary Caregivers in Percentages (%)

Parent Training Group	Direct Training (*n*=7)	Written Information (*n*=7)
Gender		
Female	100%	86%
Male	0%	14%
Race/Ethnicity		
Caucasian	100%	100%
Marital Status		
Single	14%	14%
Married	29%	71%
Divorced	29%	0%
Separated	29%	14%
Highest Level of Education		
9-12th/G.E.D.grade	71%	43%
College	29%	57%
Reading Ability		
Great Reader	57%	29%
Average Reader	43%	71%

Table 2

Rhyming Gain Scores, Effect Sizes, and Percent of Non-Overlapping Data for Child Participants.

	Gain Scores	Effect Size *d*	Non-Overlapping Data
Parent Training Group			
Direct Training (Experimental)			
D-1	3.5	7.45	50%
D-2	2.17	1.54	33.33%
D-3	5.17	1.57	50%
D-4	1.00	2.13	33.33%
D-5	.83	.88	16.67%
D-6	4.83	2.05	66.67%
D-7	3.00	--	83.33%
Average	(2.93)	(2.23)	(47.62%)
Written Information (Comparison)			
W-1	3.16	3.36	66.67%
W-2	1.84	.97	16.67%
W-3	2.17	--	66.67%
W-4	5.00	1.21	33.33%
W-5	4.66	1.62	83.33%
W-6	.67	.35	16.17%

Table 2 (continued)

W-7	-1.67	-.68	--
Average	(2.26)	(.97)	(40.41%)

Note. Dashed lines represent calculations equaling zero. $^{*}p < .05$.

Table 3

Alliteration Gain Scores, Effect Sizes, and Percent of Non-Overlapping Data for Child Participants.

	Gain Scores	Effect Size *d*	Non-Overlapping Data
Parent Training Group			
Direct Training (Experimental)			
D-1	.50	.53	33.33%
D-2	.66	.70	33.33%
D-3	3.50	3.72	83.33%
D-4	--	--	--
D-5	1.16	1.23	50.00%
D-6	-.17	-.08	16.67%
D-7	--	--	16.67%
Average	(.80)	(.87)	(33.33%)
Written Information (Comparison)			
W-1	-.84	-.67	--
W-2	1.83	--	50.00%
W-3	.50	.29	--
W-4	1.67	--	33.33%
W-5	1.50	1.60	50.00%

Table 3 (continued)

W-6	1.33	--	33.33%
W-7	--	--	50.00%
Average	(.86)	(.17)	(30.95%)

Note. Dashed lines represent calculations equaling zero. * $p < .05$.

Table 4

Weekly Averages of Time (in Minutes) of Engaged At-Home Early Literacy Activities Reported by Caregivers

	Intervention Weeks					
	#1	#2	#3	#4	#5	#6
Parent Training Group						
Direct Training (Experimental)						
D-1	15	15	0	16	12	13
D-2	NR	NR	NR	NR	NR	NR
D-3	15	17	NR	NR	NR	NR
D-4	20	20	11	17	15	15
D-5	15	30	15	17	17	15
D-6	NR	NR	NR	7	8	0
D-7	5	5	7	7	10	7
(Averages)	(14.00)	(17.40)	(8.25)	(12.8)	(12.40)	(10)
Written Information (Comparison)						
W-1	25	10	15	20	15	15
W-2	2	15	9	10	5	8
W-3	7	3	10	7	13	14
W-4	19	10	11	21	17	16
W-5	18	33	0	19	21	23

Table 4 (continued)

W-6	25	25	NR	NR	NR	NR
W-7	15	15	15	10	10	0
(Averages)	(15.86)	(15.86)	(10)	(14.5)	(16.2)	(12.67)

Table 5

Pre-intervention Responses Identifying Knowledge of Early Literacy Development in Percentages (%)

Parent Training Group	Direct Training (n=8)	Written Information (n=10)
Knowledge of Early Literacy Development		
Knows a lot	0%	20%
Knows some	62.5%	30%
Knows very little	37.5%	40%
Resources used for Early Literacy Knowledge		
Doctor/Pediatrician	12.5%	40%
Library Personnel	--	20%
Books/Magazines	12.5%	30%
Television	--	--
Family/Friends	--	20%
Teachers/Educators	87.5%	60%
Computers	--	10%
No Information Received	--	10%
Other	--	10%

Note. Caregivers provided multiple responses for the resource categories.

Table 6

Pre- and Post-Intervention Early Literacy Questionnaire Average Responses in Percentages (%) & Mean Frequency Totals

Parent Training Group

	Direct Training		Written Information	
	Pre- (n = 8)	Post- (n = 3)	Pre- (n = 10)	Post- (n = 5)
Teaching Letter Names	87.5%	100%	100%	100%
Mean	2.88	3.33	2.80	**3.80****
SD	(1.45)	(.58)	(.63)	(.00)
Teaching Letter Sounds	100%	100%	100%	100%
Mean	2.88	3.33	2.60	**3.80**
SD	(.99)	(.58)	(.52)	(.55)
Teaching Rhyming Words	50%	100%	90%	100%
Mean	1.38	3.33	1.90	**3.80****
SD	(1.60)	(.58)	(.88)	(.00)
Identification of Initial Sounds	50%	100%	80%	100%
Mean	1.63	3.33	2.30	3.40
SD	(1.84)	(.58)	(1.42)	(.55)
Teaching Environmental Print	75%	100%	90%	100%
Mean	2.50	3.33	2.70	3.40
SD	(1.60)	(1.15)	(1.34)	(.55)
Reading at Home	100%	100%	100%	100%
Mean	3.63	3.67	4.00**	4.00
SD	(.52)	(.58)	(.00)	(.00)

Table 6 (continued)

Note. Percentages were based on yes or no responses. Responses for frequencies were made on a 4-point response scale (*1=Rarely to 4=Daily).* *p<.05. Bold numbers denote a significant difference of own group changes from pre- to post-intervention phases. Two stars (**) denotes significant changes between groups at pre- or post- intervention phases.

Figure Caption

Figure 1. Progress monitoring for correct Rhyming responses for direct training student #1.

Figure 2. Progress monitoring for correct Rhyming responses for direct training student #2.

Figure 3. Progress monitoring for correct Rhyming responses for direct training student #3.

Figure 4. Progress monitoring for correct Rhyming responses for direct training student #4.

Figure 5. Progress monitoring for correct Rhyming responses for direct training student #5.

Figure 6. Progress monitoring for correct Rhyming responses for direct training student #6.

Figure 7. Progress monitoring for correct Rhyming responses for direct training student #7.

Figure 8. Progress monitoring for correct Rhyming responses for written information student #1.

Figure 9. Progress monitoring for correct Rhyming responses for written information student #2.

Figure 10. Progress monitoring for correct Rhyming responses for written information student #3.

Figure 11. Progress monitoring for correct Rhyming responses for written information student #4.

Figure 12. Progress monitoring for correct Rhyming responses for written information student #5.

Figure 13. Progress monitoring for correct Rhyming responses for written information student #6.

Figure 14. Progress monitoring for correct Rhyming responses for written information student #7.

Figure 15. Progress monitoring for correct Alliteration responses for direct training student #1.

Figure 16. Progress monitoring for correct Alliteration responses for direct training student #2.

Figure 17. Progress monitoring for correct Alliteration responses for direct training student #3.

Figure 18. Progress monitoring for correct Alliteration responses for direct training student #4.

Figure 19. Progress monitoring for correct Alliteration responses for direct training student #5.

Figure 20. Progress monitoring for correct Alliteration responses for direct training student #6.

Figure 21. Progress monitoring for correct Alliteration responses for direct training student #7.

Figure 22. Progress monitoring for correct Alliteration responses for written information student #1.

Figure 23. Progress monitoring for correct Alliteration responses for written information student #2.

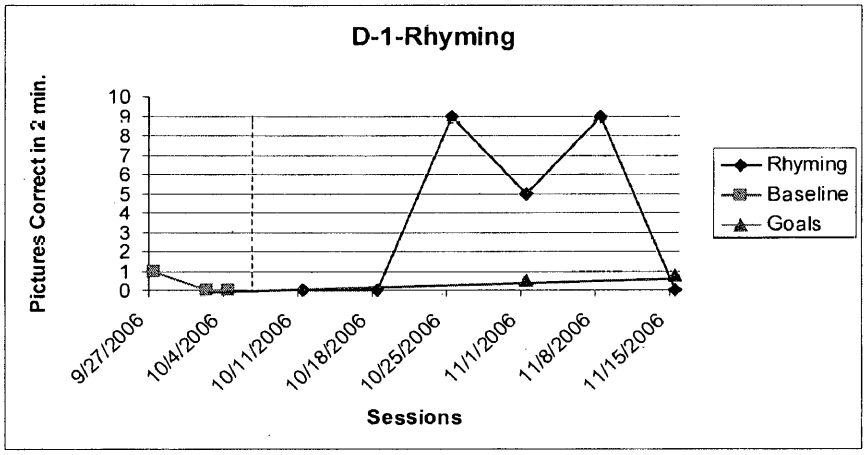
Figure 24. Progress monitoring for correct Alliteration responses for written information student #3.

Figure 25. Progress monitoring for correct Alliteration responses for written information student #4.

Figure 26. Progress monitoring for correct Alliteration responses for written information student #5.

Figure 27. Progress monitoring for correct Alliteration responses for written information student #6.

Figure 28. Progress monitoring for correct Alliteration responses for written information student #7.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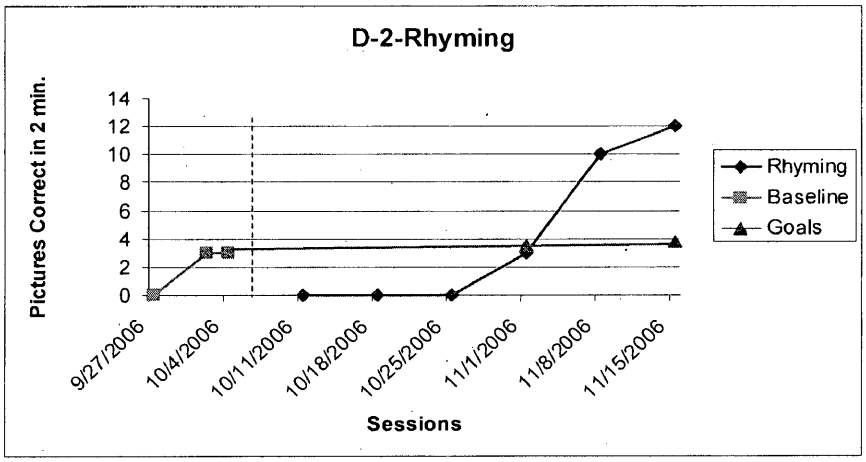
Pictures Correct in 2 min.
10
9
8
7
6
5
4
3
2
1
0
9/27/2006
10/4/2006
10/11/2006
10/18/2006
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
14
12
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9/27/2006
10/4/2006
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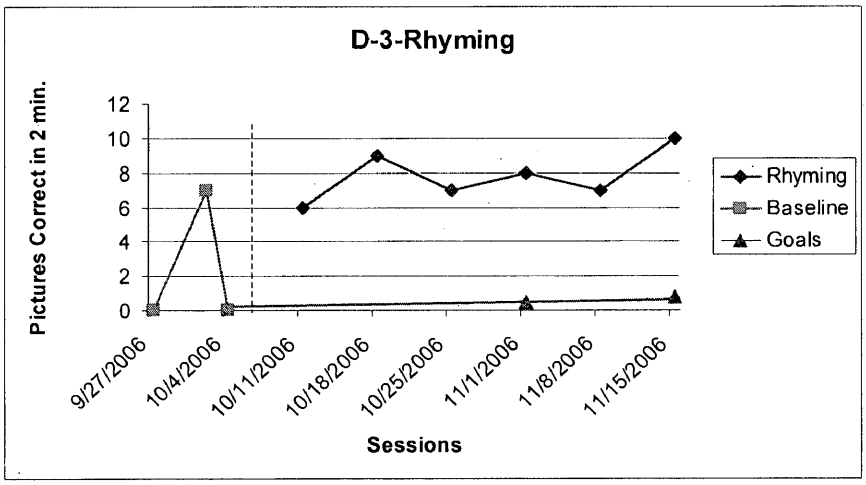
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
12
10
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9/27/2006
10/4/2006
10/11/2006
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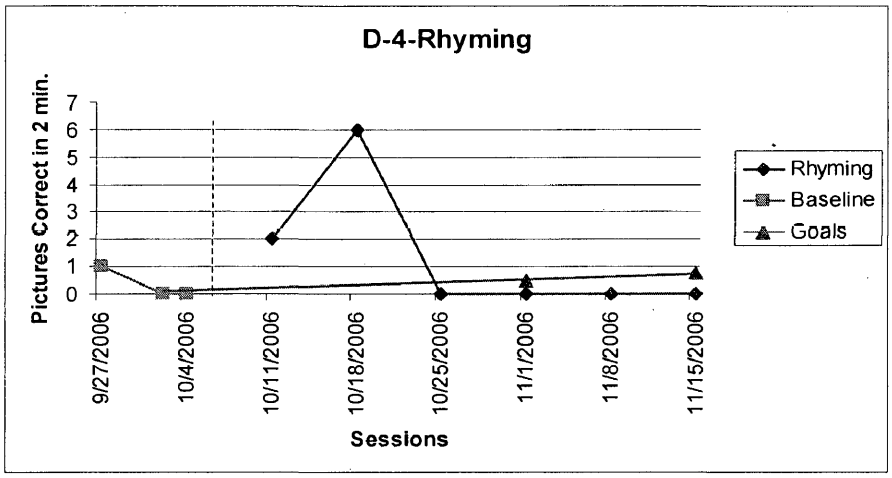
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
7
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10/4/2006
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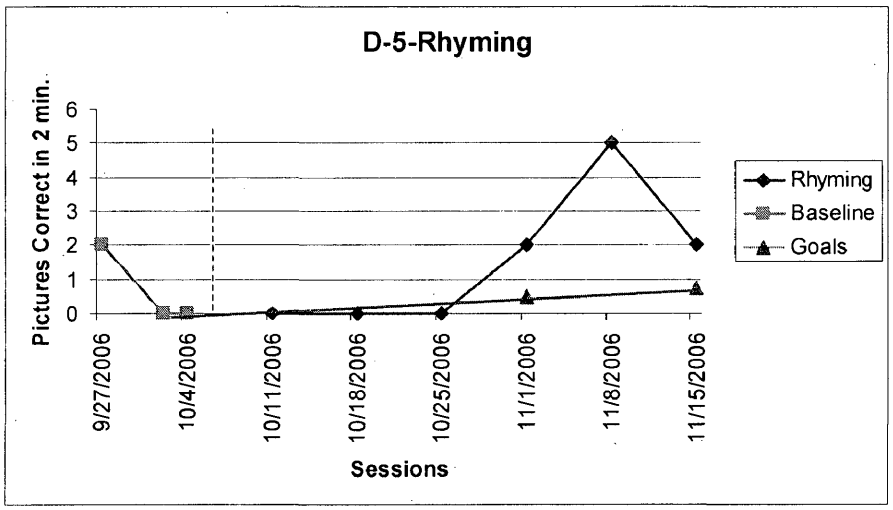
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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9/27/2006
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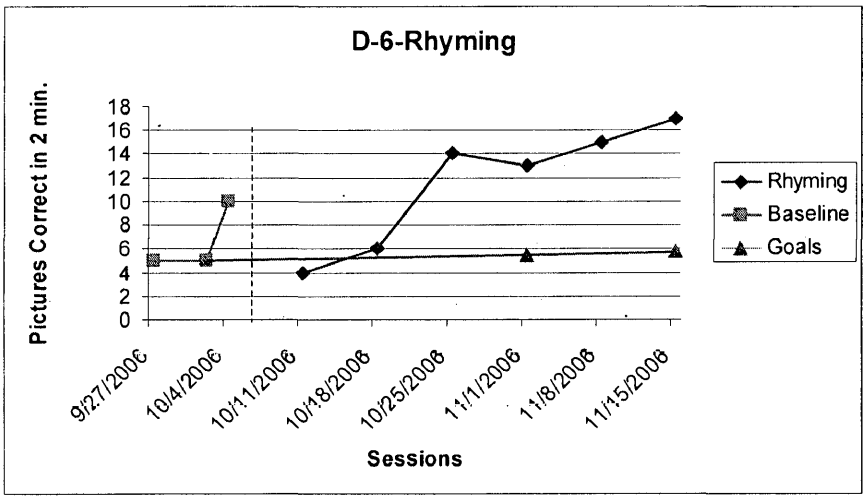
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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10/4/2006
10/11/2006
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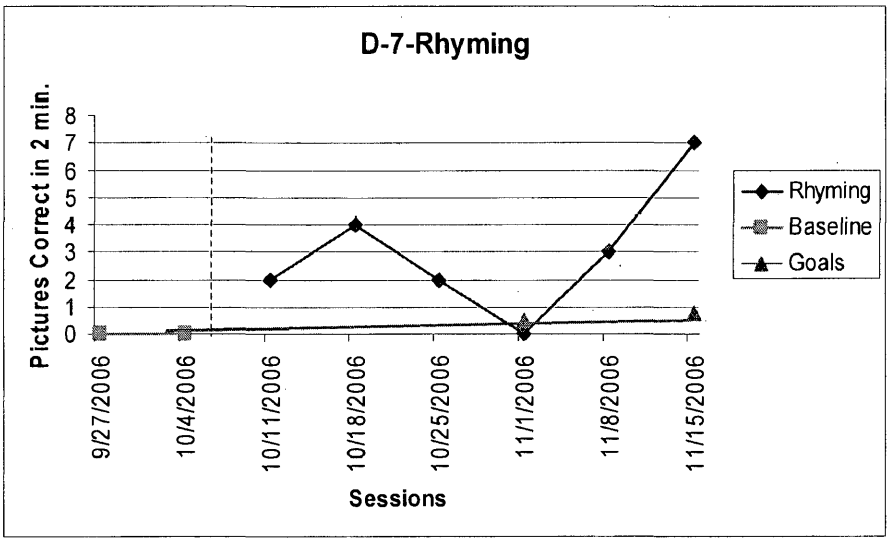
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals


D-7-Rhyming
Pictures Correct in 2 min.
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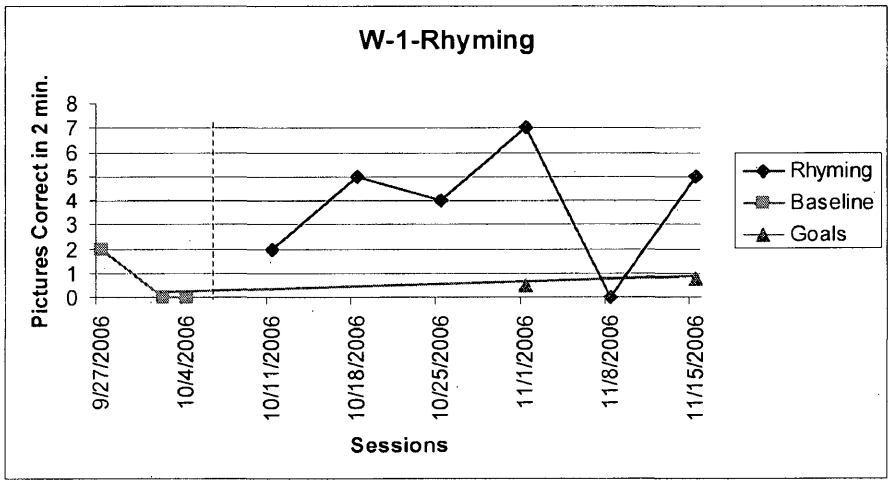
9/27/2006
10/4/2006
10/11/2006
10/18/2006
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals


W-1-Rhyming
Pictures Correct in 2 min.
8
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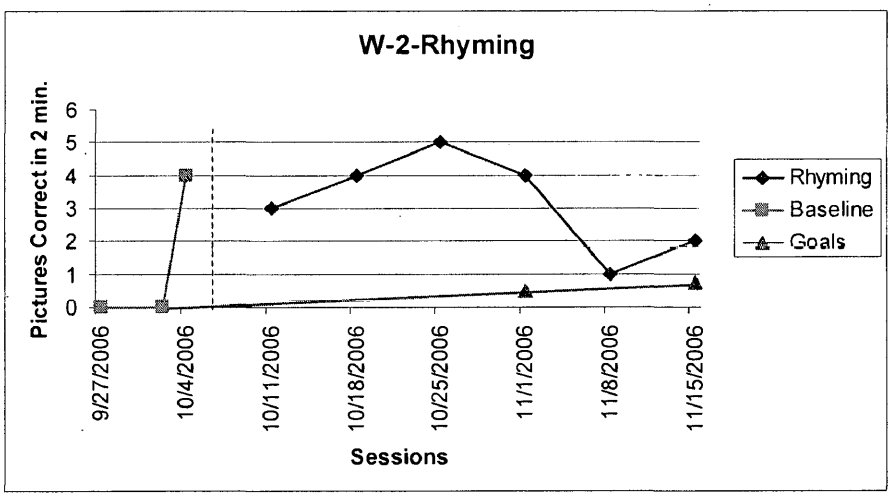
9/27/2006
10/4/2006
10/11/2006
10/18/2006
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
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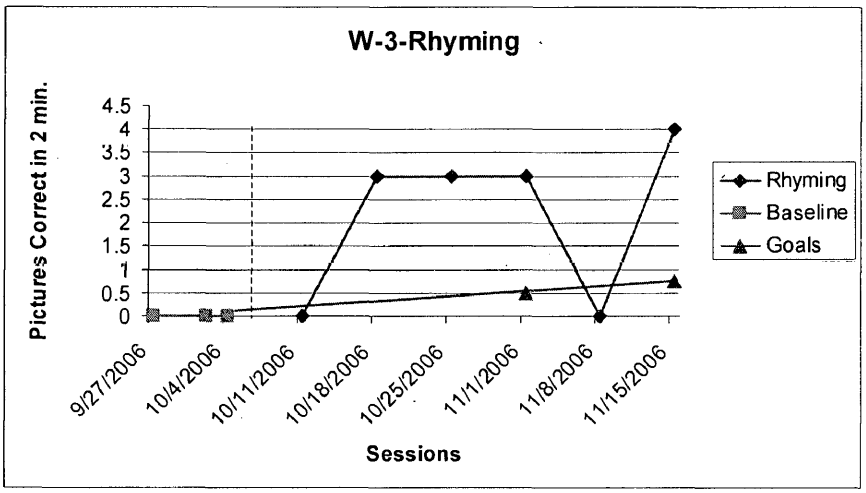
9/27/2006
10/4/2006
10/11/2006
10/18/2006
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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9/27/2006
10/4/2006
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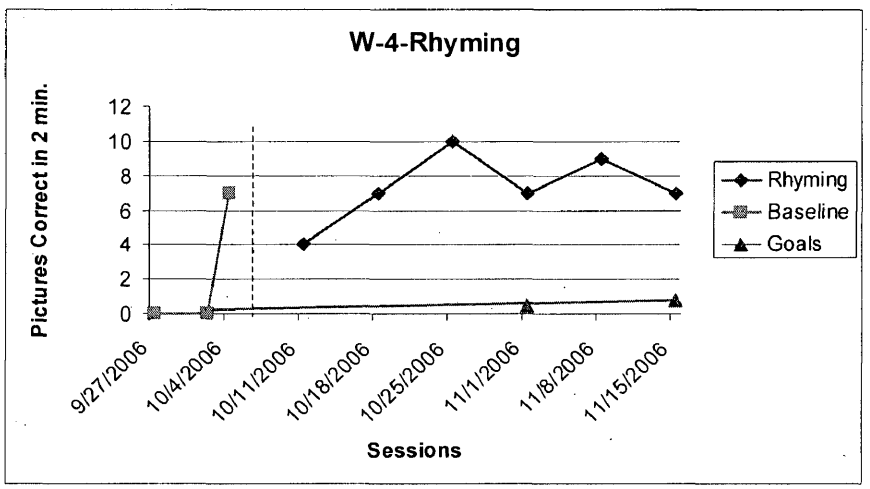
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals


W-4-Rhyming
Pictures Correct in 2 min.
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9/27/2006
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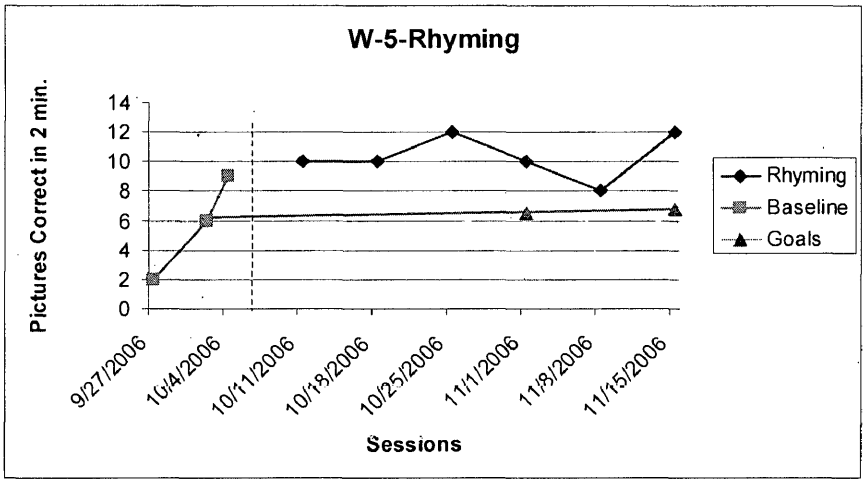
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
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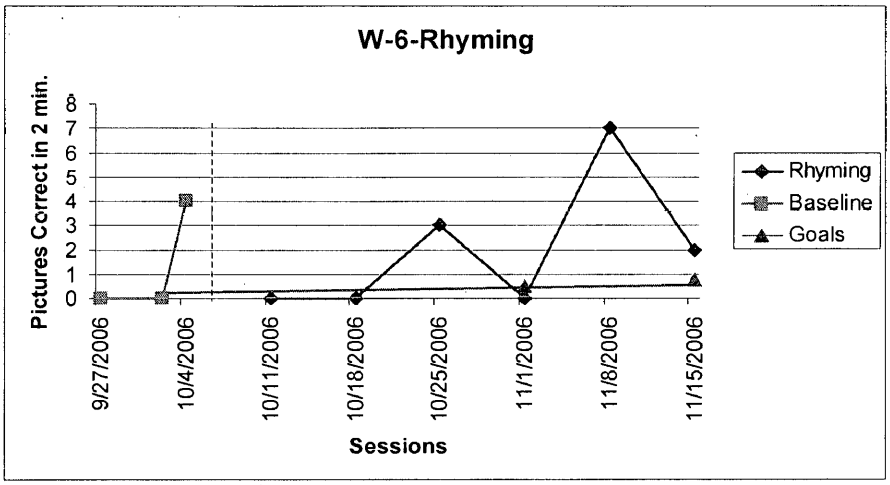
9/27/2006
10/4/2006
10/11/2006
10/18/2006
10/25/2006
11/1/2006
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals


W-6-Rhyming
Pictures Correct in 2 min.
8
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9/27/2006
10/4/2006
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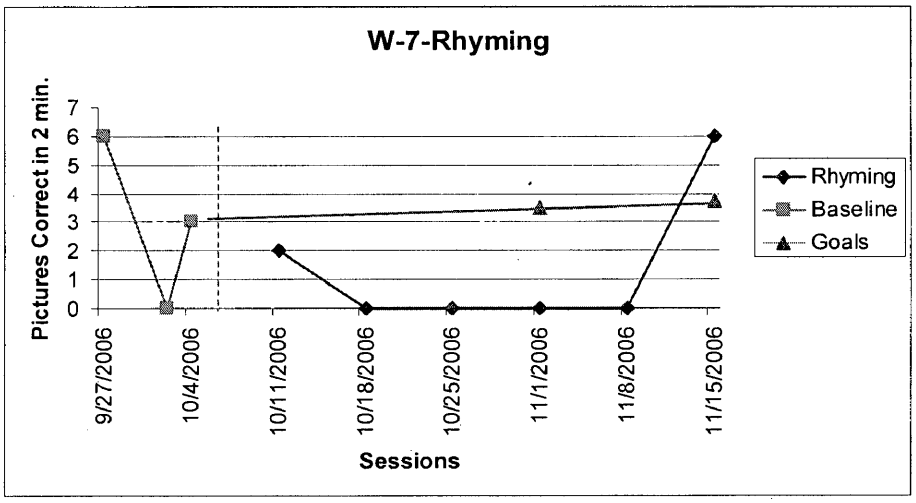
11/8/2006
11/15/2006
Sessions
Rhyming
Baseline
Goals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Pictures Correct in 2 min.
7
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9/27/2006
10/4/2006
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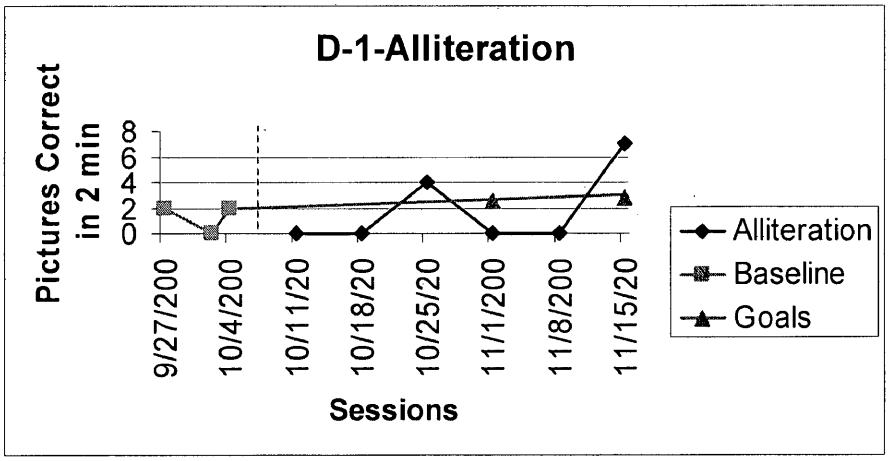
11/15/2006
Sessions
Rhyming
Baseline
Goals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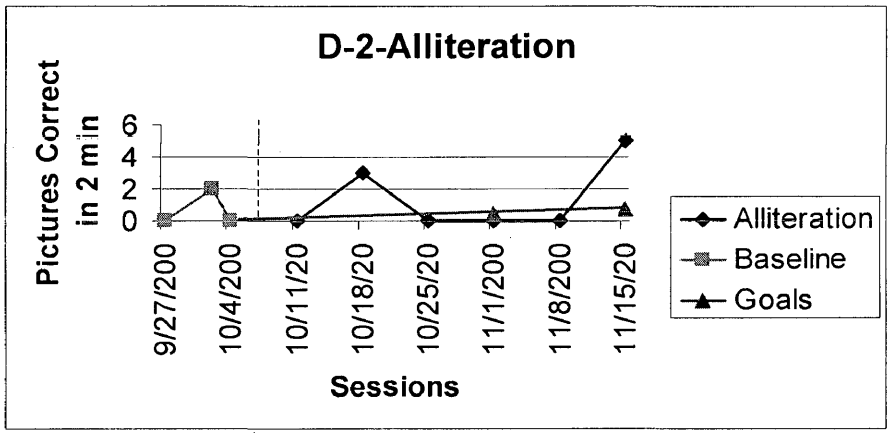
Pictures Correct in 2 min
8
6
4
2
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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Pictures Correct in 2 min
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4
2
0
9/27/200
10/4/200
10/11/20
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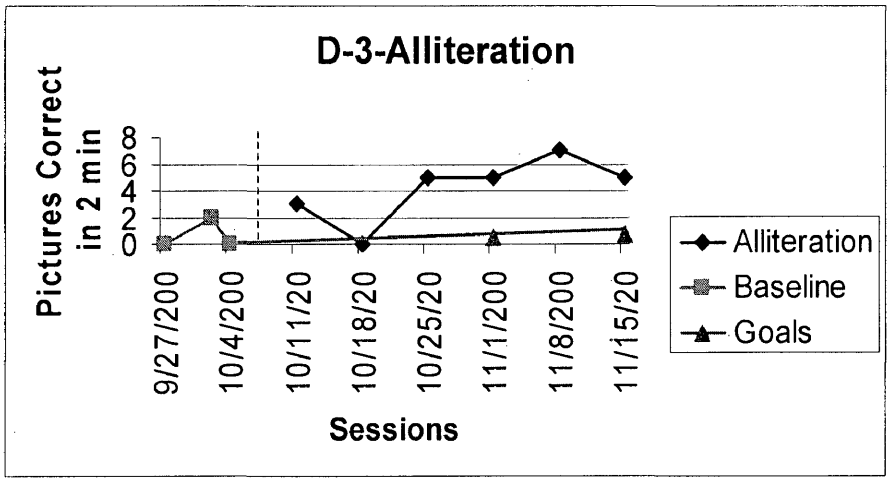
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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Pictures Correct in 2 min
8
6
4
2
0
9/27/200
10/4/200
10/11/20
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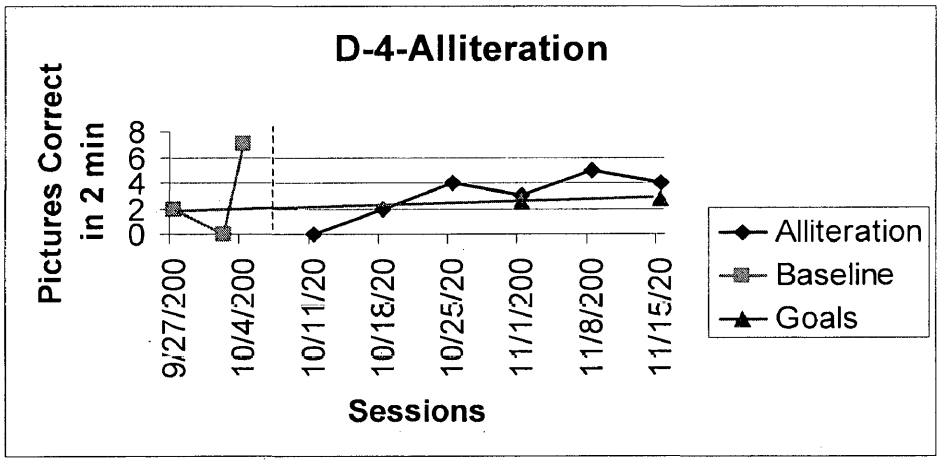
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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Pictures Correct in 2 min
8
6
4
2
0
9/27/200
10/4/200
10/11/20
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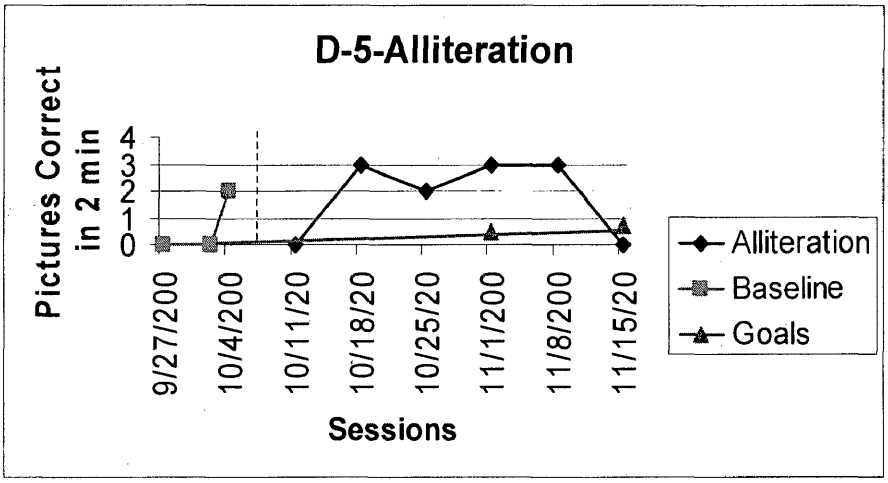
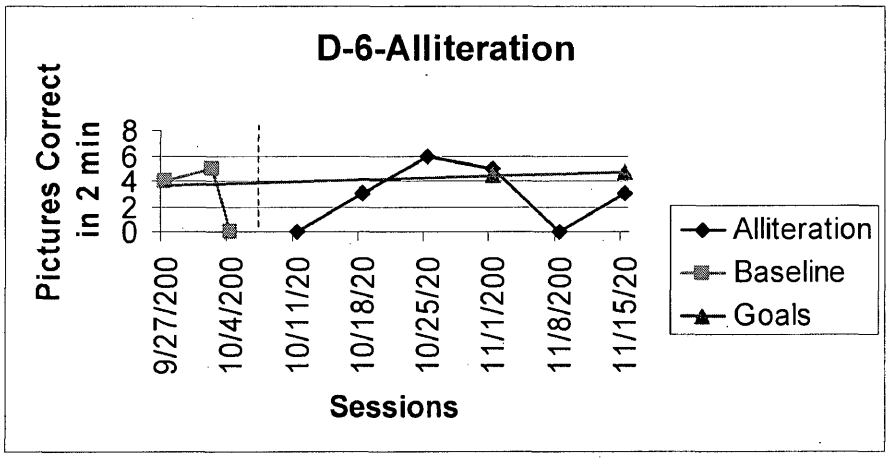
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


D-5-Alliteration
Pictures Correct in 2 min
4
3
2
1
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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Pictures Correct in 2 min
8
6
4
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0
9/27/200
10/4/200
10/11/20
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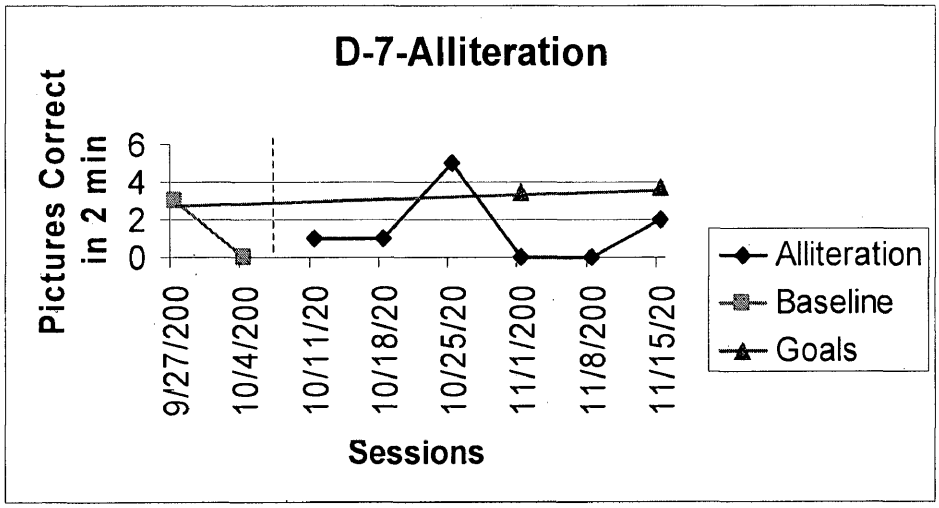
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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Pictures Correct in 2 min
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4
2
0
9/27/200
10/4/200
10/11/20
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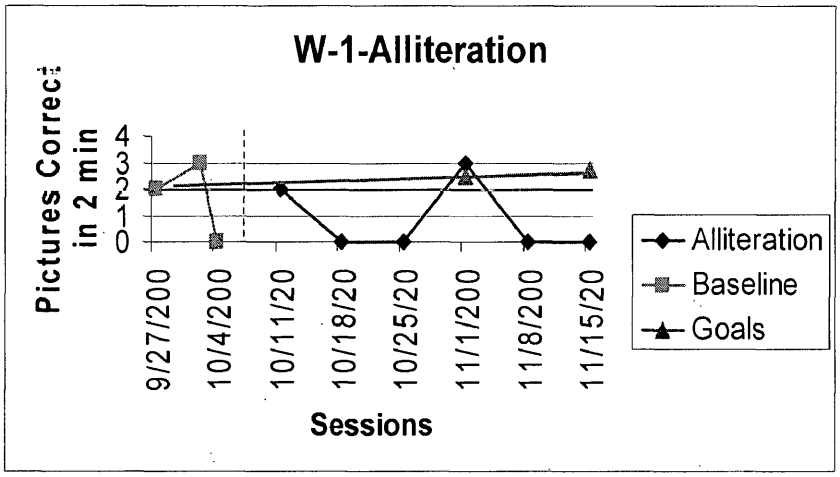
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals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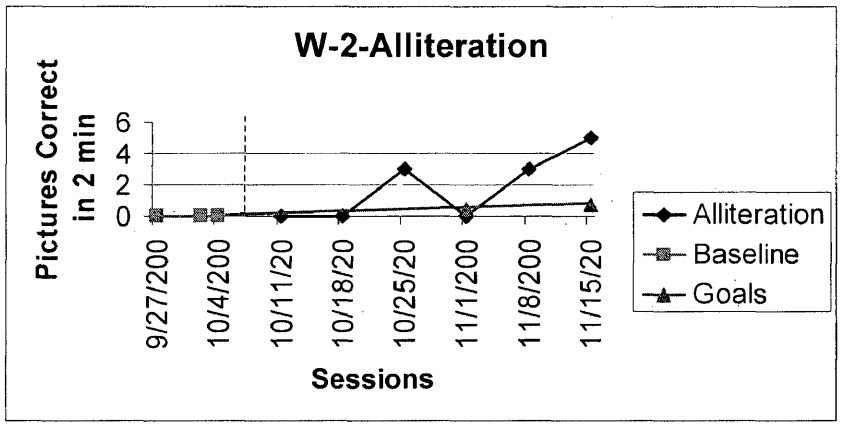
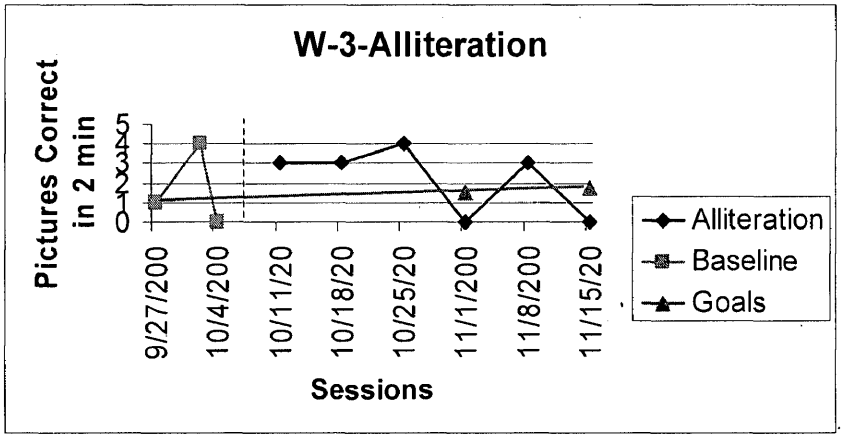
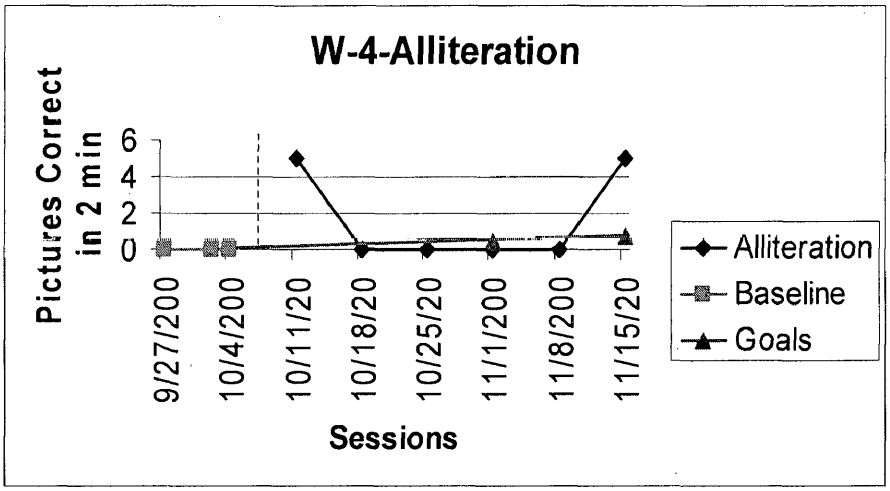
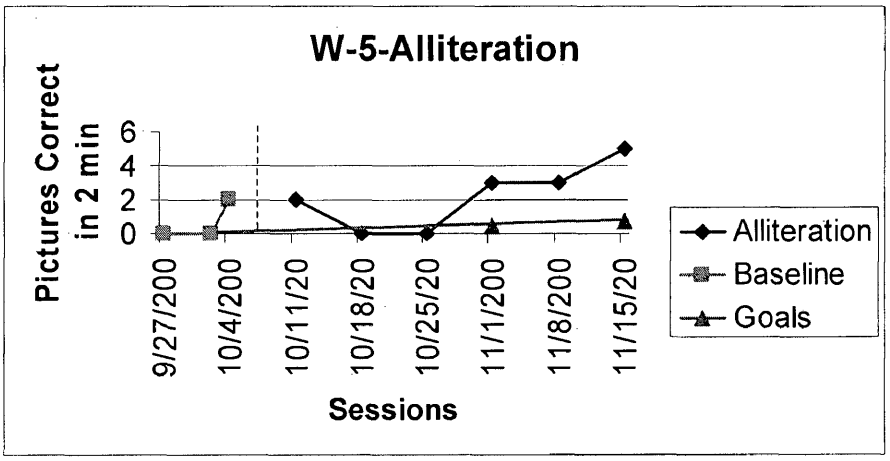
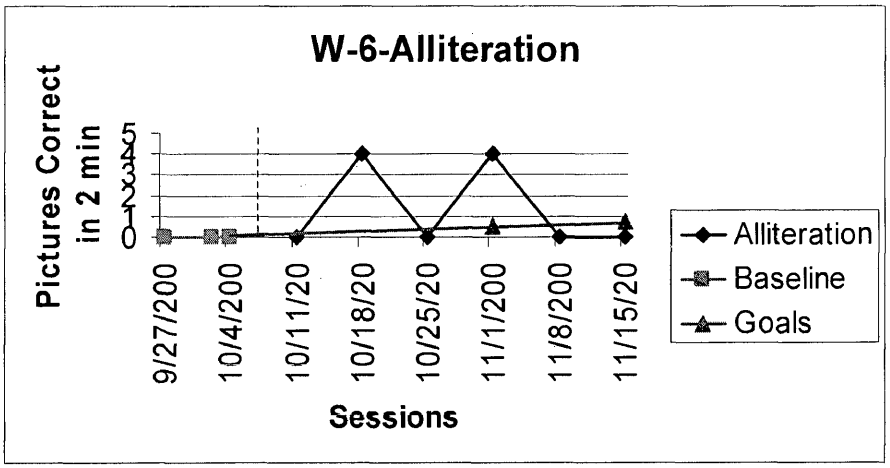
Pictures Correct in 2 min
4
3
2
1
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals

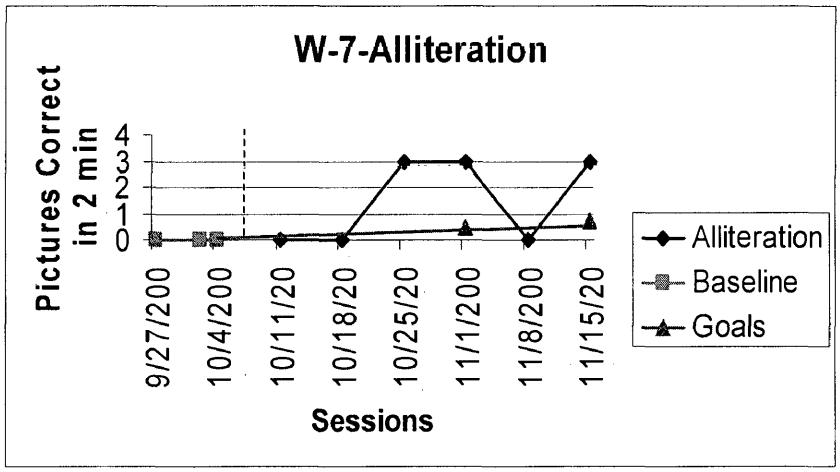

W-2-Alliteration
Pictures Correct in 2 min
6
4
2
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


W-3-Alliteration
Pictures Correct in 2 min
5
4
3
2
1
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


W-4-Alliteration
Pictures Correct in 2 min
6
4
2
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


W-5-Alliteration
Pictures Correct in 2 min
6
4
2
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


W-6-Alliteration
Pictures Correct in 2 min
5
4
3
2
1
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals


W-7-Alliteration
Pictures Correct in 2 min
4
3
2
1
0
9/27/200
10/4/200
10/11/20
10/18/20
10/25/20
11/1/200
11/8/200
11/15/20
Sessions
Alliteration
Baseline
Goals