THE EFFECTS OF EXPLICIT PHONOLOGICAL AWARENESS INSTRUCTION ON THE PREREADING SKILLS OF PRESCHOOL CHILDREN AT RISK FOR READING FAILURE: COMPARING SINGLE AND MULTIPLE SKILL INSTRUCTIONAL STRATEGIES

DISSERTATION

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ABSTRACT

Phonological awareness skills (i.e., phonemic awareness, rhyme awareness, awareness of alliteration, etc.) are important to the reading ability of all participants (National Early Literacy Panel, 2007; National Reading Panel, 2000). More specifically, these skills are critical to the success of participants defined as at risk for reading disabilities (Adams, 1990; Juel, 1988). This study analyzed the effects of explicit instruction in phonemic awareness, rhyme awareness and awareness of alliteration as well as instruction in discrimination of the differences among the skills and their relationships. This study also provided a basis for introducing a computerized format of the Get it, Got it, Go and to compare the results obtained from the computer-based version with the traditional format of the assessment. Results indicate that participants responded favorably to the explicit instruction through increased responding if they had evidence of the individual skills prior to the beginning of instruction and emergence of the skill and growth in responding after instruction started. The computerized format was also found to be a valid and reliable format of the Get it, Got it Go assessment instrument. Lastly, contributions of this study and future research are presented.

DEDICATION

Dedicated to my family

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CHAPTER 1

INTRODUCTION

Early literacy and reading skills are fundamental to the success of all participants (Hart & Risley, 1995; Lane, Pullen, Eisele, & Jordan, 2002; McCollin & O'Shea, 2005; Torgesen, 2002). Dickinson and Neumann (2006) assert that early childhood literacy is the best investment for facilitating the growth needed for a lifetime of success (Lane, Menzies, Munton, Von Duering & English, 2005). This lifetime of success is not only regarding the academic arena, but can be associated with economic success and achievement of goals (Corcoran & Chaudry, 1997). On the other hand, lifelong success is severely restricted as reading practice and literacy experiences are limited and result in weak vocabulary development and difficulty learning in other academic areas (Lyon & Fletcher, 2001; McCollin & O'Shea, 2005; Nancollis, Lawrie & Dodd; 2005).

Reading is defined as recognizing words and an understanding of the individual and collective meanings of those words; with the ultimate goal being comprehension of the text meaning (Mesmer & Griffith, 2006). Learning to read involves everyday encounters with words, including new words previously unseen by the reader although they may be a part of a child's oral vocabulary (Phillips & Torgesen, 2006). As the child begins to appropriately match oral language with print, a child's awareness of that potential leads to a greater chance of success in subsequent attempts to read (Strickland &

Shanahan, 2004). Children's awareness of the communicative aspect of print is thought to begin early in life as the result of repeated exposure to print in familiar, everyday contexts (Neuman & Roskos, 1993). These contexts can range from interactions with parents, siblings, caregivers and/or peers. Oral language, the basis of emergent literacy, is impacted by the quality and type of interactions that a child encounters during their formative years (Hart & Risley, 1995). This awareness begins with assigning cues to objects, seeing familiar words on everyday items (i.e., cereal boxes & restaurants) and continues with the extrapolation of critical features of the written language into those and similar contexts. Although it may not be "reading," by definition, it is the use of print-meaning associations that begin the journey through emergent reading (Neuman & Roskos, 1993).

Reading may seem effortless, but in fact it is a complex cognitive and linguistic process that requires skillful human intervention and the orchestration of several areas of the human body (Kame'enui & Simmons, 2001). Efficient reading seems like a natural act as it is nearly impossible to see a word and not read it, thereby rendering reading an automatic act (Ashby & Rayner, 2006). This automatic act is dependent upon the eyes, brain, mind (e.g. motivation; interest, and personal histories of reinforcement), and a language, speech and complex writing system (Kame'enui & Simmons, 2001). Although it appears to be an automatic act, for a teacher, preparing participants to read is a complicated process which involves several skills that have many dimensions (Ashby & Rayner, 2006; Torgesen et. al, 2001).

Prior to understanding what constitutes quality early childhood literacy practices or the need for language at this age, it is essential to communicate the importance of targeting language skills during the early childhood years (Torgesen, 2002). The assessment of reading disabilities and brain dysfunction associated with reading is not a new phenomenon. In 1895, a Scottish ophthalmologist described a reading disability as "congenital word blindness" (Needlman, Klass & Zuckerman, 2006). The last 100 years has widened the origins of reading failure beyond that of simply a medical issue and it is no secret that early childhood education and more specifically, early childhood special education has grown in popularity both in funding and research over the last few decades (Britto, Fuligni & Brooks-Gunn, 2006; Lonigan, 2006; Rothstein, 2004). It is this attention that has underscored the need for supporting the literacy growth of young children. Prevention has been highlighted as important, for the Individuals with Disabilities Education Improvement Act of 2004 has allocated the use of up to 15% of funds for preventative measures in special education (IDEA, 2004).

When discussing supportive reading services, it is necessary to understand the differences between research on preventive interventions and remedial interventions. Torgesen (2004) defines prevention interventions as those that are begun in kindergarten or first-grade, prior to the need for remedial instruction. Central to the idea of remedial interventions is the notion that there are impairments that need to be corrected or "remediated," which is the case when children have failed to learn critical pre-reading skills. Readers in need of remedial intervention often exhibit clear and significant difficulties in learning to read and are in need of methods that are designed to accelerate

reading growth (Torgesen, 2004; Torgesen et. al, 2001). These children have experienced reading failure which is often the result of faulty stimulus control. Even with the use of these "specialized' instructional methods designed to promote and boost reading skills it can be met with great resistance for older struggling readers and the long-term development of reading skills appears to be more difficult for older children (Lyon & Fletcher, 2001; Torgesen, 2002).

Torgesen's definitions bring to light a serious problem that pervades reading research. There is a divide between research that focuses on children ages 3-5 in early childhood programs and those children that upon entering kindergarten are a part of the school-age population. Not only is it difficult to draw the distinction between prevention and remedial interventions, but as Torgesen suggests, a true prevention study does not exist if it is begun during the kindergarten years (2004). He reasons that prevention research participants in kindergarten are selected on the basis of their presenting with a lagging behind in the development of critical pre-reading skills. This, in fact, is a catalyst for a small remediation of impairments in these participants in order to prevent reading difficulties (Torgesen, 2004).

Coupled with the divide in available research, this limitation provides the basis for not only the focus on prevention interventions as a whole, but more specifically the study and use of prevention interventions that begins during the preschool years. True prevention, according to Torgesen (2004) needs to occur prior to the development of a reading impairment.

The question therefore is, "How do you solve the problem of identifying appropriate participants for prevention reading interventions?" Given the limited resources that are available, professionals need to maximize the impact of resources by identifying those children at risk for reading failure and targeting instruction to the individual needs of children. However, identifying children as at risk is not an easy task. There are problems that occur with selection of individuals, for over-identification on the basis of a broad range of characteristics (e.g. SES, English as an additional language, etc.) can lead to the Matthew Effect (Stanovich, 1986) which will keep participants that are characterized as poor readers in a track of poor reading through the first grade (McNamara, Scissons & Dahleu, 2005). It is the realization of the above problems that leads one to ask if selection criteria are even needed to decide who will receive prevention intervention. Utilizing selection criteria can be seen as unnecessary because according to the National Reading Panel Report (2000), explicit and systematic instruction in phonemic awareness, reading comprehension, phonics, vocabulary development, and fluency are critical for all participants' success. While many children will learn to read without significant difficulty, regardless of the reading intervention or instructional strategy used, even if it is ineffective, there remains a large group of participants that will need an empirically-valid method of instruction (Carbo, 2005; Lonigan, 2006). Therefore, when used responsibly, explicit and systematic instruction can be a very necessary tool in order to provide the best instruction available for participants.

Selection criteria prompt individualized services and progress monitoring. After reading the research, using the selection criteria of at-risk seems to fit a large group of people that fit into the 30% of participants that may fall through the cracks if taught using an ineffective strategy.

Purpose of Study

In response to the issues raised above, the purpose of this study was to analyze the effects of explicit instruction in phonemic awareness, rhyming and alliteration, as indicators of phonological awareness, which is a valuable skill in early literacy (National Early Literacy Panel, 2007; National Reading Panel, 2000). Participants were engaged in explicit instruction in three component skills in phonological awareness: phonemic awareness, rhyme awareness and awareness of alliteration. The participants in this study were identified as at-risk preschoolers according to their socio-economic status. All participants were eligible for free or reduced-price meals. Vadasky, Sanders and Peyton (2006) assert that this group is characterized as experiencing disproportionate numbers of participants that have reading problems. Also, this study examined the difference between teaching skills separately (i.e., single skill) and teaching discrimination (i.e., multiple skills) of the differences among the skills. Additionally, this study analyzed the comparison of a computer-derived version of an individual growth and development indicator (IGDI), the Get it, Got it, Go and the traditional flashcard format of the assessment tool.

Research Questions

1. What are the effects of explicit language instruction on the phonemic awareness (i.e. phoneme identification) of participants?
2. What are the effects of explicit rhyming instruction on the rhyming skills of participants?

3. What are the effects of explicit alliteration instruction on the alliteration skills of participants?
4. What are the effects of explicit language instruction on the differences between the above skills (i.e. discrimination) on the phonemic awareness, rhyming and alliteration skills of participants?
5. Will the participants maintain the language skills developed during the intervention after the instruction has ended?
6. What are the effects of using the computerized version of an Individual Growth and Development Indicator (IGDI), the Get it, Got it, Go in comparison with the traditional format of the GGG?
7. What are participants' attitudes about the instructional activities?
8. What are the teachers' attitudes about the instructional activities and the participants' progress and skill achievement obtained through this study?

CHAPTER 2

REVIEW OF LITERATURE

Early Intervention

Birth to kindergarten is a critical epoch for all children. Most children learn a remarkable amount from the time of their birth until they begin school. Children best prepared for school success are those who have developed age appropriate language and social skills. Children who begin kindergarten with greater language skills (Hart & Risley, 1995) and or math skills (Gersten & Chard, 1999) are better positioned for academic success. In comparison, those children who enter school with significantly lower levels of language and math skills are at increased risk for school failure and possible special education placement (Adams, 1990). Keogh, Berheimer, and Guthrie (2004) found in their 20 year follow-up study that 3 year old children identified as having developmental delays often continued to experience problems even into adulthood.

Early intervention has undergone a dramatic change over the last few decades especially as the allocation of resources and the political climate has supported the need for early intervention services in a variety of areas (Torgesen, 2002; McNamara, Scissons & Dahleau, 2005). The 1970s saw a dramatic change in the way in which service

providers catered to children ages 0-5 (Richmond & Janis, 1980). Medical intervention and infant care dramatically changed the landscape, for in 1979, the infant mortality rate dropped to 13 per 1,000, which was the result of a steady decline and was the lowest on record. In the 20 years before, the infant mortality rate was cut in half and the mortality rate for children to age 14 was also reduced by 50% in 1977 (Richmond & Janis, 1980). The responsibility lies in efforts targeted at prevention and improvements in basic human needs. Early childhood programs, such as Head Start have been shown to promote development across several categories, such as emotional, physical and academic development as well as dense in interactions that can be the source of literacy instruction (Corcoran & Chaudry, 1997; Rothstein, 2004; Duncan & Brooks-Gunn, 1997; Hart & Risley, 1995). Early intervention is thought to be the primary means of preventing the adverse effects of social depravation on the language and literacy of children and more specifically children who have the propensity to be labeled at-risk (Nancollis, Lawrie, Dodd, 2005).

Helping children increase their skills is essential to later success. Professionals believe that for children with or at risk for disabilities the critical period of birth to 5 years old is amplified (Raver, 2009). Therefore, professionals have promoted interventions and programs that will support families in helping children with developmental delays to develop language, social, physical, and academic skills for the purpose of improving children's opportunities for success in school and beyond. These interventions and programs can be found in the area of early intervention and its' neighbor, early childhood special education.

What is Early Childhood Special Education (ECSE)?

Defining ECSE is not an easy task. The term early intervention is generally used to define services provided to children from birth to 3 years old and their families (Raver, 2009). Early interventions focus on both children and families. Early childhood special education usually refers to educational interventions for exceptional children 3-5 years old.

Odom and Wolery (2003) recommend a unified theory of practice for the professionals working with young children merging *early intervention and early childhood special education* (EI/ECSE). Early intervention/early childhood special education involves the implementation of purposeful and systematic practices that are based on professional evidence, when available (Odom & Wolery, 2003). An interdisciplinary service perspective is helpful so that a seamless system is in place for exceptional children and their families (Bowe, 2000; Hooper & Umansky, 2009).

In order to address the needs of infants, toddlers, and families each state has a system of EI/ECSE services designed to meet the special needs of children with disabilities, developmental delays, or considered at risk (Odom & Wolery, 2003; Hebbeler et al., 2007). The goal of EI/ECSE services is to prevent or lessen the effects of disabilities or developmental delays on the lives of children and their families. That is, through careful planning and the use of empirically validated interventions children with or at risk for disabilities are able to develop skills that will promote success in their environments. Therefore, the definition of EI/ECSE is not just descriptive of who

receives services and what services are provided but it involves the impact of those services on children and their families.

The reality is that the effectiveness of ECSE interventions is at least partially defined by their ability to minimize or prevent the impact of disabilities on young children and the ability to assist families. This characteristic of EI/ECSE interventions making a positive difference is not easily captured in quantifiable ways in applied settings. For example, it is not always possible to determine if an intervention was the cause for a child previously considered at risk, who is now demonstrating typical developmental behaviors (i.e., prevent the manifestation of a disability) for young children. Nor, is it a simple matter to determine how well an intervention has diminished the potential negative impact of identified disabilities or developmental delays. The fact is, that positive outcome is the most important variable in EI/ECSE even if it is not directly attributable to the intervention.

There is a firm belief among professionals that EI/ECSE is both needed and required for young children with special needs and their families for positive outcomes. It is generally believed by early childhood specialists that the earlier the intervention begins the more positive the outcome for children (Raver, 2009). Therefore, the initial timing of the intervention is important. Not only is it important that interventions begin as early as possible in the lives of children at risk for or with disabilities, but that the interventions have an empirical foundation and are designed to meet the unique needs of each child (Odom & Wolery, 2003). Further, it is essential that interventions should be closely monitored to determine the effects of the intervention on each child. If the period from

birth to five years old is critical, then every day without intervention or using ineffective intervention is not just unhelpful but detrimental. The best way to determine the effectiveness of an intervention is by the careful assessment of important target behaviors across time.

In sum, ECSE is a wide range of services designed to assist infants and young children with disabilities, developmental delays, or considered at risk to maximize the children's potential. Further, ECSE are services designed to support and equip families of children with special needs in order to promote successful transitions into schools and communities.

The Development of Early Childhood Special Education

The idea that early intervention can positively impact outcomes for children with or at risk for disabilities has its roots in the 1930's. Skeels and Dye (2002) in their seminal study (originally published in 1939) of children labeled as mentally retarded found that the one on one attention and cognitive stimulation positively influenced the children's IQ scores. Further, in comparison to similar children who were only provided appropriate nutrition and medical care, those children who additionally received early intervention (i.e., caring adult attention) had better outcomes including being more likely to become independent and successful as adults. Despite methodological problems with this study it served as a catalyst for additional studies of young children (Heward, 2009).

Several decades later, in the 1970's the Milwaukee Project was developed to improve outcomes for children of impoverished mothers with mental retardation. The parents were provided information on how to engage their infants to enhance cognitive

development. (Garber & Bagab, 1988). The project reported an average increase in IQ of 33 points across the children. This project was also subjected to criticism due to methodological problems (Page, 1972). Yet, the increased IQ scores of the children could not be dismissed even if there was not a clear functional relationship between the intervention and outcomes for participants.

Another project that demonstrated impressive results was the Abecedarian Project. The Abecedarian Project is an initiative that is over 30-years old that involves intense intervention for children in poverty from birth to kindergarten (Child Development Institute, 2008). The results indicate increased IQ scores for at risk children and academic benefits that continued to be evident through the 3rd grade (Martin, Ramey, & Ramey, 1990).

Yet another program, the Infant Health and Development Program (IHDP) provided intervention services to prematurely born and low birth weight infants. This study involved approximately 1,000 children and families in eight sites around the country. The study found a positive correlation between how much children and their families participated in early intervention and the intellectual development of the children.

While these studies are important in establishing the research base for ECSE, the truth is that each study has research methodological concerns. The concerns include the appropriate selection of meaning outcome measures, the wide difference between the types of intervention employed, and the difference across the participants in the studies (Heward, 2009). These methodological concerns do not negate the importance of the

studies in influencing professionals in the necessity of careful systematic implementation of intervention for young children in order to prevent or diminish the effects of disabilities (Guralnick, 2005).

The fact is, the belief in the necessity of early intervention is a strongly held conviction by ECSE professionals (Guralnick, 2001; Hooper & Umansky, 2009). This belief in early intervention is not just a concept shared by ECSE professionals but it is a generally held concept that has been manifested in the laws enacted by the federal government.

Early Education Laws

Thirty years ago, the first landmark legislation that impacted children with special needs and their families, the Rehabilitation Act (PL 93-112) was signed into law. Passed in 1973, the Rehabilitation Act prohibited discrimination on the basis of disabilities by programs receiving federal funds. This prohibition includes programs serving young children (e.g., Head Start Programs). Section 504 of the Rehabilitation Act allows children with disabilities or who are at risk for academic failure to receive specialized education services. The Rehabilitation Act was important in setting the occasion for future special education legislation.

The enactment of PL 94-142 the Education of All Handicapped Children's Act of 1975 (retroactively renamed Individuals with Disabilities Act [IDEA]) acknowledges the right of all children ages 5- 21 to a *free and appropriate education, the right for parental participation in educational decision making, individualized educational plan, multifactored evaluation, and placement in the least restrictive educational environment*.

Initially IDEA was focused on the educational rights of school-age children. The subsequent passage of PL 99-457 in 1986, both amends and expands PL 94-142. PL 99-457 focused on the rights of infants and preschoolers to services that could enhance their future opportunities. The purpose of Congress in enacting PL 99-457 was:

- To enhance the development of infants and toddlers with disabilities and to minimize their potential for delay.
- To reduce educational costs by minimizing the need for special education and related services after handicapped infants and toddlers reach school age.
- To minimize the likelihood of institutionalization of handicapped individuals,
- To enhance the capacity of families to meet the special needs of infants and toddlers. [20 U.S.C. Sec. 1471]

The reauthorization of IDEA in 2004 continued the affirmation of the need for early intervention from birth to five years old (Raver, 2009).

Part C of IDEA or the Program for Infants and Toddlers with Disabilities is a federal grant program that provides funding for states to develop and operate a comprehensive statewide program of early intervention services for infants and toddlers and toddlers with disabilities.

Who Receives ECSE Services?

Children and families come into contact with ECSE professionals in a variety of ways. Some families will know before their child's birth that the child has a disability in this case the physician or hospital often initiate contact with ECSE professionals (Hebbeler et al., 2007). Some children's need for early intervention becomes evident as

they grow. In this case a child's special needs may be first be noticed by a physician, parent, childcare giver, preschool teacher, or a family friend. After a special need is suspected each child goes through some diagnostic process to determine if there are disabilities or developmental delays that warrant intervention (Hebbeler et al., 2007).

Once a child is identified as needing EI/ECSE services, an Individualized Family Service Plan (IFSP) is completed. An essential component of any intervention for young children is the (IFSP). The IFSP is a key component in designing programs to address the unique needs of each child and family. The IFSP addresses the child present level of performance in regards to physical, motor, sensory, cognitive, communication, social-emotional behaviors, or adapted behaviors. The accompanying assessment portion helps to determine if the child is experiencing disabilities or developmental delays in one or more of the categories. The IFSP involves a collaborative effort between families and EI/ECSE professionals to design and implement early interventions.

In terms of identification and provision of services, children who enter early intervention by the age of 2 ½ years the mean age for an initial concern about the child's development was 7.4 months with a initial diagnosis approximately a little over a month later (Hebbeler et al., 2007). The family and team of professionals design an IFSP to assist that child in maximizing his or her ability to develop typical behavior patterns based on professional knowledge and family desires. The selection of interventions is not only impacted by the type and degree of severity of the developmental delay but also by the family's circumstances (Hebbeler et al., 2007). That is some families may need more support in order for early intervention services to be effective.

Families of children in need of EI/ECSE services are as diverse as the general population. However, there are disproportionalities concerns in regard to who receives services. Boys tend to out number girls in early intervention. Approximately 61% of the children receiving early intervention services are boys (Hebbeler et al., 2007). Children from low socioeconomic status homes are also disproportionately represented among those receiving early intervention services. Ethnically, children receiving early intervention are more likely to be from African American families than White families (Habbeler et al., 2007). It is imperative that professionals are culturally sensitive to the unique needs of children and families. Hebbeler and colleagues (2007) report that families overwhelmingly indicate that at least their first encounter with EI/ECSE professionals is positive, 99%.

Early Intervention/Early Childhood Special Education Programming

Programming can be most effective if it targets the skills during the period of early intervention that are predictive of later achievement in reading. The National Early Literacy Panel (2007) presented findings at the 16th Annual National Conference on Family Literacy that are recommendations for practitioners who focus on early language and literacy development. In a meta-analysis that originated with 7300 publications, the Panel sought to identify emergent literacy skills and the predictive relationships between those skills and conventional literacy outcomes. Conventional literacy outcomes were defined as decoding, reading comprehension and spelling. Strong to moderate predictors of later literacy achievement were correlated with the skills of alphabet knowledge, concepts about print, phonological awareness, oral language, name writing and rapid

automatic naming. The results of this meta-analysis support several important points regarding early literacy intervention. Primarily, the evidence supports the building of children's literacy skills during the preschool period. Secondly, this analysis identifies skills that give the children the strongest foundation for learning to read and provides guidelines for assessment of those skills. Finally, it provides allows for service providers to make informed decisions about selecting the best methods to prevent reading deficiencies among preschool children (National Early Literacy Panel, 2007).

Early Reading Interventions

Torgesen marries the importance of early intervention with the prevention of reading disabilities by including conclusions derived from consistent reading research (2002). It has been established that reading is a critical skill that is not only needed for success in school, but also for future opportunities that are available throughout adulthood (Hart & Risley, 1995; Lane, Pullen, Eisele, & Jordan, 2002; McCollin & O'Shea, 2005; Torgesen, 2002; Dickenson & Neuman, 2006; Lyon & Fletcher, 2001). Since reading is such a critical skill, it is necessary to understand what effective reading instruction in order to promote reading success and to prevent reading failure. The National Reading Panel (NRP) (2000) recommends that reading instruction include phonemic awareness, phonological awareness, fluency, vocabulary and comprehension. Torgesen (2002) also asserts that the ultimate goal of reading instruction is to aid children in acquiring all of the skills necessary for comprehension. The NRP (2000) states that comprehension skills are achieved when readers are able to effectively engage in intentional problem solving and thinking processes. Readers should be able to relate the

ideas represented in print to their own knowledge, past experiences or histories, and construct mental representation that allow them to reason strategically in order to overcome barriers in reading (National Reading Panel, 2000; Carbo, 2005). In order to acquire good reading comprehension, Torgesen (2002) states that a child must first have a general level of language comprehension as well as phonological awareness at the word level. In order to have these skills, participants need to have knowledge of specific reading strategies such as those accomplished through phonemic awareness and phonics instruction (Lane, Pullen, Eisele & Jordan, 2002; Snow et. al, 1998). Torgesen (2002) concludes that it is the inclusion of these skills that provide the critical components that are required for effective comprehension of written material but adds that instruction and expectations need to be individualized and take into account the participants general verbal ability and language comprehension skills.

There is a correlation between early and chronic problems in acquiring word identification and phonological skills and children's subsequent ability. These early and continuous problems in prereading skills can lead to several characteristics that define an at-risk reader. This reader often has difficulty applying the alphabetic principle (Neuman, 2006; Foy & Mann, 2006) and being effective in the analysis of new words (Torgesen et al., 2001).

While intervention for struggling readers is needed, it is important to understand how we can shift to prevention of reading problems when it comes to reading. One of the first steps may be to understand the skills that young children possess prior to entering school that may prevent them from acquiring effective reading skills. In looking at

acquiring phonemic awareness, Torgesen (2002) states that children with reading problems can be characterized along a continuum of general verbal ability, from no or little verbal ability to superior verbal ability. Children who are deficient in their general verbal ability will enter school with a greater likelihood of difficulty in learning to read due to their delay in a broader range of prereading skills (Lane et al., 2002; Snow et al., 1998; Torgesen, 2002;). This group of children comprises those that caregivers, school psychologists, interventionists, service providers and teachers often denote as "at-risk."

At-risk Early Intervention

"At-risk" is a difficult term to define because it has been applied in a variety of contexts. Heward (2006) defines at-risk as participants who have a greater-than-usual chance for developing a disability. Neuman (2006) defines at-risk through the economic disparity that exists which can translate into skill and knowledge delays in America's poor children. Economic disparity, measured through socio-economic status has been found to impact the level of family support available and directly influence the literacy gap of young children (Britto et al, 2006; Snow et. al, 1998; Regardless of the definition, what is known is that there is a correlation between young at-risk children who find reading and writing difficult and their performance on academic measures (Nancollis, Lawrie, Dodd, 2005; Lane, Pullen, Eisele & Jordan, 2002).

Blame as to the causation of the knowledge gap has been placed on the U.S. Department of Education, failing schools, and the racial and economic background of participants and their families (Rothstein, 2004). Rothstein (2004) states that all of these factors may attribute to the cause and offers that failing schools and racial and/or

economic background can be misleading. He asserts that there are specific social-class patterns that correlate with specific participant outcomes that result in the current achievement gap. These specific social-class patterns were also found by Hart and Risley (1995).

The knowledge gap between at-risk participants and typically developing participants is often viewed to have origin in two places. One gap is a result of the economic disparity that many of these families face due to a lack of resources that are typically associated with knowledge acquisition (Neuman, 2006; Rothstein, 2004). Resources such as newspapers and books are scarce and developmentally appropriate reading materials for young children are virtually non-existent (Neuman, Celano, Greco & Shue, 2001; Corcoran & Chaudry, 1997; Hart & Risley, 1995). In a summary of research, Britto et al. (2006) surmise that family-, school- and community-level inputs and influences are significantly linked with early literacy outcomes and impact the early reading ability of at-risk participants.

Two, an origin for the knowledge gap is the lack of learning opportunities (Corcoran & Chaudry, 1997; Hart & Risley, 1995). Neuman and Roskos (1993) designed a study that looked at whether or not young children in poverty benefitted from adult-mediated and literacy-rich play settings in the formulation of functional and environmental print tasks. The results of their study show that the traditional method of providing occasions for interaction with environmental contexts wasn't as successful as adult-mediated (i.e., teacher-directed) opportunities for young children in poverty. Suggestions provided by the authors were that children from low-income families may

not have the natural opportunities for exposure and engagement with print. These natural opportunities focus on the need for more explicit direction in reading instruction in order to promote literacy. The authors provided direct experiences with print and exploration of various tools associated with literacy and allowed participants to practice the behaviors associated with those experiences (Neuman & Roskos, 1993). It is through that practice that at-risk participants can begin the journey as that of typically developing participants in constructing meaning and moving towards understanding how literacy and the environment combine to create opportunities for effective reading and other goals.

Reading prevention interventions focus on at-risk populations and designing curriculum and instructional strategies that will meet them at their instructional point of need (Bursuck, Munk, Nelson, Curran, 2002). These interventions have risen in popularity not only because an allocation of funds in this area but also the research that points to the costs of waiting until mid-elementary years to focus on reading instruction for those who are struggling (Bursock & Damer, 2008; Torgesen, 2002). Interventions focused on preventing reading failure are often begun when children are learning pre-readings skills, typically during the preschool years. The preschool population is an important one to target because according to Hodgkinson (1991) (as cited in Kame'enui, 1993) one-third of preschool children are destined for school failure because of poverty, neglect, sickness, and handicapping conditions as well as issues related to a lack of adult protection and nurturance. Therefore, according to Kame'enui, these participants are behind in reading and language development (1993). Unfortunately, the Matthew effect, as applied by Stanovich (1986) to reading means that as the participants rich in language

continue to grow, those that are deficient, remain or continue to become poorer in reading and language opportunities. Supported by Nagy and Anderson (1984), there is an estimated 9,990,000 word difference in the number of words read per year in those who are avid readers and those who have reading difficulties during the late elementary school age years.

Empirical research has also supported the need for a specific reading intervention for at-risk participants. Hindson et al. (2005) reviewed the progress of at-risk preschool participants in comparison of their typical peers (without familial risk). Familial risk is defined as genetic risk of a reading disability which has been validated through research (Hindson et al., 2005). Cognitive and linguistic assessments were used to assess participants and to place them in the at-risk or no risk categories. Children were assessed on phonological awareness: examples of skills tested are phonemic awareness, sensitivity to rhyme, and the ability to read nonsense words. Results showed that those preschool participants defined as being at-risk showed profiles with deficits similar to participants who were in need of remedial interventions later in school.

Prior to understanding what constitutes the label of "at-risk," it is necessary to review the characteristics of a good reader. Lyon and Fletcher (2001) state that a good reader is able to

> "understand how print represents sound of speech, they can apply the phonemic and phonics skills rapidly and fluently and they possess vocabularies and other language abilities sufficient to actively connect what they are reading to their background knowledge and experiences (p. 12)"

Conversely, participants at-risk for a reading disability aren't equipped with sufficient phonological processing skills. Kame'enui (1993) proposes a framework for instruction that can benefit participants at-risk for reading disabilities. Instructional time is valuable and, according to Kame'enui, efficient, explicit instruction should be the goal. That time should be teacher-directed and participant-centered, using participant progress as a guide for decisions on instructional changes. Lastly, Kame'enui suggests, as cited by Stanovich (1986) a *surgical strike* whereby reading interventions should focus on more frequent opportunities to read, opportunities to actively participate in literacy activities and interventions which focus on early development of phonemic awareness and knowledge of letter names (1993).

This *surgical strike* has been occurring in Head Start for just over 40 years (Zill & Resnick, 2006). Initially it was created as a program to provide opportunities for low-income families to combat the lack of stimulation at home and low-quality child care and poor early education experiences. Over the history of the program it has expanded to target literacy and the development of effective reading skills among the population it serves. Head Start should not be discounted as a force in targeting the prevention of reading disabilities for in 2003 services were provided to over 900,000 families with an annual cost of $6 billion (Zill & Resnick, 2006). The reauthorization of Head Start in 1998 provided not only an additional $1billion to improve the quality of services but mandated programming to include explicit instruction in pre-reading skills such as print awareness, phonemic sensitivity, and word-decoding skills.

Although Head Start is quite widespread, it cannot serve all participants and is limited to low-income participants and a small percentage of participants with disabilities. Participants identified as at-risk for a reading disability often need explicit instruction in phonemic awareness in order to jump start their literacy experiences (Mathes & Torgesen, 1998; Kame'enui & Simmons, 2001).

Recommendations for Reading Instruction

Explicit & Systematic Instruction

Explicit instruction is important in allowing participants to be able to relate reading skills and to generalize those skills to various settings (Pullen, Lane, Lloyd, Nowak, 2005). Explicit and systematic instruction is recommended by the National Reading Panel as an effective way to teach beginning reading skills (National Reading Panel, 2000; Torgesen, 2002). Cambourne (2004) defines explicit instruction as the practice of bringing to a reader's mind those skills which they need to improve in order to become an effective reader. Coupled with explicit instruction is the need for instruction to follow a system. Systematic instruction is instruction that is planned prior to the instruction period and reflects the needs of the participants. It is a necessary instructional strategy for participants who are at-risk for reading problems (Bursuck et. al., 2004; McCollin & O'Shea, 2005; Torgesen, 2002). For children who grow up with stable environments in which print, communication and literacy is abundant, they may be able to understand language and how it corresponds to later literacy and reading development. For at-risk readers who haven't necessarily had a print and language-rich environment,

literacy development is severely compromised (Torgesen, 2004; McCollin & O'Shea, 2005).

Literacy Skills for Young Children

The Fundamentals of Literacy

The most fundamental skills are known as the "alphabetic principle," which states that: (a) letters represent speech sounds, (b) letters go together to make words and (c) a change in letters results in a change in sounds and the words (Neuman, 2006; Foy & Mann, 2006). Readers may use several strategies in order to recognize words. These strategies include (a) prediction-using context and knowledge of linguistics in order to guess; (b) decoding- conversion of individual letters and patterns of letters into sounds and blending those sounds; (c) analogy- using word parts including morphemes to analyze the structure of a word and (d) recall- retrieval of a known word from memory (Ehri, 2004; Mesmer & Griffith, 2006) Learning to read doesn't start with words in a book, but it encompasses decoding the alphabetic language, a speech system and a complex writing system (Kame'enui & Simmons, 2001; Santi, Menchetti & Edwards, 2004). Decoding involves many skills, including being able to identify individual phonemes, mapping those phonemes to the appropriate letters as well as using that knowledge to understand novel words (Foy & Mann, 2006; Santi, Menchetti & Edwards, 2004;). That knowledge, according to Ehri (2004), is necessary in order for participants to be able to read words in and out of text. Phonics is a popular instructional method that focuses on teaching participants how to use letter-sound relations to spell or recognize words in order to read (Mesmer & Griffith, 2006; McCollin & O'Shea, 2005; National

Reading Panel, 2000; Santi, Menchetti & Edwards, 2004). Instruction in phonemic awareness and phonics is understood to be essential for learning to read for beginning readers. Children cannot become skilled readers if they do not know this system (Ehri, 2004; Bryant, MacLean, Bradley & Crossland, 1990; McCollin & O'Shea, 2005). Correlational research has also supported the fact that awareness of phonemes and letter knowledge are the best predictors of how well participants will be able to read during the first two years of explicit reading instruction (National Reading Panel, 2000; Foy & Mann, 2006).

It is very difficult to understand the differences between phonemic awareness and phonological awareness and how it relates to the process of reading. Quite often, the confusion between these terms originates with researchers for they are often mistaken for each other in journal articles and other publications geared for teachers and other members of the educational community. It is possible that this confusion accounts for the ineffective interventions or for a teacher's reluctance to target each of these skills explicitly. Some may even question the skills that should be targeted. The National Early Literacy Panel (2007) provided information on the importance of phonological awareness, which encompass the skills of detecting and manipulating rhymes, syllables and phonemes. The report issued by the National Reading Panel also supports the importance of phonological awareness, specifically phonemic awareness, stating that the best training involves explicit and systematic instruction, focusing on one or two phoneme manipulations (2000). In looking at both of these special reports, it indicates that phonological awareness and the supporting skills (e.g., phonemic awareness)

necessary to have that awareness are critical to early reading acquisition and the prevention of reading disabilities for young children (Torgesen, 2002).

Emergent literacy, or pre-reading skills are interdependent, therefore it is necessary to target each of these skills in order to build the reading repertoire of young children (Lonigan, 2006; Foy & Mann, 2006). Reading words includes a variety of skills such as recognition of correct pronunciation, and the meaning and roles of words in spoken language (Ehri & Roberts, 2006). Ehri and Roberts (2006) also expand the process of reading by stating that readers often apply strategies such as decoding, prediction, analogy, and sight word recognition. Simply put, by targeting letter knowledge and phonemic awareness, many beginning readers are able to move into the phase of emergent reading and beyond.

Phonological Awareness

Lonigan (2006) defines phonological awareness as the ability to detect or manipulate the sound structure of oral language. More specifically it is one's ability to manipulate phonemes through having a conscious sensitivity to the letter-sound structure of language (Lane et al., 2002; Rothstein, 2004). Phonological awareness has been shown to be a reliable predictor of reading achievement and a critical part of beginning reading instruction and one of the areas that educators can significantly impact in order to prevent or remediate deficiencies in reading (Lane, Pullen, Eisele & Jordan, 2002; Kame'enui & Simmons, 2001; Torgesen, 2002; National Early Literacy Panel, 2007).

Phonological awareness encompasses many skills and concepts that are associated with early reading acquisition (see Appendix B). Lane, Pullen, Eisele & Jordan (2002)

associate phonological awareness with specific skill sets: word awareness, onset-rime awareness, syllable awareness and phonemic awareness. The difference between phonological and phonemic awareness is based upon the size of the linguistic unit that is being manipulated (Longian, 2006). Phonological awareness also differs from phonemic awareness in that it encompasses not only the awareness of phonemes, but also other concepts and skills such as syllables and rhyming words (Ehri & Roberts, 2006).

In a synthesis of research, Lane et al. (2002) provide 7 main generalizations regarding phonological awareness and its contribution to reading research, acquisition and intervention. Borrowing from the National Reading Panel's (2000) report regarding reading research, Lane and colleagues (2002) firmly believe that phonological awareness is directly and reliably related to reading ability. Supported by several others (Kame'enui & Simmons, 2001; Lonigan, 2006; National Early Literacy Panel, 2007) phonological awareness provides a basis for teachers to explicitly target beginning reading skills across age groups and skill level. The efforts found to be most successful were those that targeted code-related skills, such as phonological awareness and were combined with print training (National Early Literacy Panel, 2007). Teachers are able to target particular skill deficits that one participant may be having and in doing so are able to see generalization in other skill sets (see phonemic awareness). While this reciprocal relationship is established, it is important to note that specific skills emerge and must be mastered prior to instruction on more complex skills being explicitly targeted (Castles & Coltheart, 2004; Lane et al., 2002).

Teaching Phonological Awareness

There are several tasks that can be used to assess and teach phonological awareness. Production of rhyming words and segmenting sentences into words or words into syllables are indicators that participants are phonologically aware (Ehri & Roberts, 2006). Participants who have a strong phonological awareness are also able to detect, blend, match and manipulate speech sounds (Lane, Pullen, Eisele & Jordan, 2002). In using these skills, participants are able to move more efficiently into decoding print (Lane, Pullen, Eisele & Jordan, 2002). Lane, Pullen, Eisele & Jordan (2002) state that phonological awareness tasks are often excellent predictors of whether or not a participant will have a reading disability or impairment.

Targeting only rhyme awareness vs. phoneme awareness may yield an unbalanced approach to reading instruction, especially when explicit instruction isn't the primary means of intervention. Foy and Mann (2006) in an attempt to find the most effective way to teach phonological processing compared a rhyme awareness approach and a phoneme awareness approach to see which where differentially associated with aspects of phonological processing. As supported by previous research, Foy and Mann (2006) found that the approaches associated with phoneme awareness produced the most significant gains in reading.

Lane et al. (2002) suggested several informal ways for caregivers to teach and assess phonological awareness. Teachers can have participants tap words using a rhythm stick or finger for each word in a sentence or phrase. This exercise is especially useful for participants who have trouble distinguishing syllables and words. In order to assess

the more complex skill of segmenting sentences, teachers can have participants count and tally the words in a sentence. Segmentation and the counting/tallying exercises can also be used in order to teach and assess skills associated with syllable awareness (Lane, Pullen, Eisele & Jordan, 2002).

Phonemic Awareness

Although phonemic awareness is thought to be a part of phonological awareness, meaning that it is acquired through phonological awareness training, it is in fact a separate skill that can be taught explicitly (Lonigan, 2006). Pure phonemic awareness training involves using sounds *only* (Kame'enui & Simmons, 2001). That is, phonemic awareness is a skill typically instructed on prior to phonological awareness. The National Reading Panel (2000) also divide phonemic awareness from phonics instruction, stating that unless phonemic awareness involves blending or segmenting sounds in words *using letters,* it isn't included in phonics training (Carbo, 2005; National Reading Panel, 2000). Phonemic awareness consists of the ability to focus on and manipulate phonemes in spoken words (Ehri & Roberts, 2006; National Reading Panel, 2000; Kame'enui & Simmons, 2001; Carbo, 2005). Phonemes are the smallest units found in spoken language and awareness of phonemes is a foundational skill in reading (Kame'enui & Simmons, 2001; Lane, Pullen, Eisele & Jordan, 2002; National Reading Panel, 2000). Kame'enui and Simmons (2001) after a review of research place a lack of phonemic awareness as the blame for reading difficulties because phonemic awareness consists of a specific set of cognitive and linguistic processes that strongly influence early reading skills. Phillips and Torgesen (2006) state that prior to understanding phonemic awareness, clarification is

necessary as to whether it is a skill or a conceptual understanding. This difference may account for how it is approached and taught by teachers. It is argued that it cannot be solely construed as a skill for participants must grasp the concept of phonemic awareness, or the awareness that a single-syllable word such as *bat* can be subdivided into beginning, middle and ending sounds and individual phonemes can be combined to form words (Phillips & Torgesen, 2006). The conceptual notion of phonemic awareness also extends to the idea that manipulation of individual phonemes can create new words that share similarities.

As a child gets older, research states that phonemic awareness improves which suggests that phonemic awareness has the common properties associated with a skill. Therefore, Phillips and Torgesen (2006) offer a definition that accounts for both of these characteristics in that:

> "it involves a more or less explicit understanding that words are composed of segments of sound smaller than a syllable, as well as knowledge, or awareness, of the distinctive features of individual phonemes themselves (p. 102)."

The contribution of phonemic awareness to reading is that it impacts the development of phonemic decoding, a subskill of phonemic awareness. Decoding is defined as a skill that involves sounding out letters and blending them to form recognizable words (Ehri & Roberts, 2006). In terms of reading acquisition, phonemic decoding, as defined by Torgesen et al. (2001) is what teacher's typically report as a participant's ability to "sound-out" words, or more theoretically, the knowledge of the

regular relationships between letters and sounds and the ability to blend phonemes. Another subskill of phonemic awareness is phonemic spelling (Phillips & Torgesen, 2006).

The National Reading Panel's position on the use of phonemic awareness as a part of a treatment package for early literacy programming is quite clear. The Panel states that teaching phonemic awareness instruction provides the children with a foundation that improves their reading beyond that of any other reading instruction that didn't include phonemic awareness (National Reading Panel, 2000). The improvement was found in children from varying ability levels, even including typically developing participants who were not at-risk for developing a reading disability or reading failure. Phonemic awareness training also provided an opportunity for skill maintenance and generalization to other skills. Not only were participants able to maintain the skill after training ceased, but the effects of phonemic awareness training were found in other subgroups of phonological awareness (e.g. onset rime, rhyming) (National Reading Panel, 2000).

Teaching Phonemic Awareness

Teaching children how to manipulate phonemes has been shown to be beneficial under a variety of teaching conditions and across a variety of learners and grade levels (National Reading Panel, 2000). Methods of instruction that include phonemic awareness have also been shown to significantly improve a participant's reading more than any method that doesn't include any phonemic awareness (National Reading Panel, 2000). There are several tasks that can be implemented in teaching phonemic awareness. Many

of the instructional methods include segmentation, isolation, blending and deletion (Ehri & Roberts, 2006). What does phonemic awareness look like? Children that display phonemic awareness often are able to recognize individual sounds in words (e.g. Tell me the first sound in *mat*); listening to a sequence of separately spoken sounds and combining them to form a recognizable word (e.g. What is */mmm/ /aaaaa/ /t/* ?); breaking a word into its sounds by counting out sounds or positioning a marker for each sound (e.g. How many phonemes do you hear in the word *mat*?); and recognizing what word remains when a specific phoneme is removed (e.g. What is mat without */mmm/*? (Kame'enui & Simmons, 2001; National Reading Panel, 2000).

It is critical to understand the difference between phonemic and phonological skills, quite often activities and interventions that are targeted for phonological awareness often teach the independent skills that are included under phonemic awareness (Lonigan, 2006). The importance of phonemic awareness training is marked by Torgesen (2002) as a critical tool in phonics training. He states that if a child has little awareness that phonemes are combined to create new and different words, then the alphabetic principles of our language are lost to that child because it makes no sense and therefore will severely impact their future reading ability. Nichols, Rupley, Rickelman and Algozzine (2004) support Torgesen's claims through their study that sought to find a correlation between the skills of phonemic awareness and concepts of print among a variety of variables such as previous preschool experience, gender, socioeconomic status and race in among kindergarten participants. Their findings suggested that low SES participants

are at a greater risk of not developing phonemic awareness and concepts of print during typical kindergarten instruction (Nichols et al., 2004).

Other Sub-Skills of Phonological Awareness

Phonological awareness, as mentioned previously, consists of not only phonemic awareness but also syllable awareness, onset-rime awareness, word awareness and rhyming and alliteration skills (see Table 1 for a complete presentation of these skills and their contribution to early literacy). Several researchers in early acquisition of reading research have concluded that all of these skills are interdependent and therefore generalization often occurs from one skill to the next or mastery of one skill becomes the gateway to another skill (Kame'enui & Simmons, 2001; Lane et al, 2002; Lonigan, 2006; National Reading Panel, 2000).

Another sub-skill that deserves a lot of attention is rhyme awareness because it is thought to be the first skill associated with phonological awareness that young children master (Lane et al, 2002). Instruction in rhyming has been debated as to its use as a pre-intervention tactic in teaching phonemic awareness. Martin and Byrne (2002) found that simply including instruction in rhyme may not automatically translate into phoneme sensitivity, or the ability to detect subtle differences among phonemes for those groups of children who lack it, such as at-risk participants. Lane et al. (2002) also support Martin & Byrne's (2002) claims in stating that all participants may not have an inherent ability to recognize rhyme and therefore will need explicit instruction as to what constitutes a rhyme as well as careful instruction that includes examples and non-examples of rhymes. In addition, Lane and colleagues (2002) state that instruction on the particulars of rhyme

are not sufficient, but participants also need to consider manipulation skills such as rhyme generation, rhyme oddity detection, matching rhymes and blending onsets and rimes. Rhyme generation, specifically, is a challenging task, but it is an excellent indicator of a child's ability to apply phonological knowledge to novel situations (Lane et al., 2002). Hindson et al. (2005) support the work of Lane et al. (2002), by asserting that explicitly instructing rhyming skills benefits participants in being prepared for phonemic awareness training when intervention occurs. Similarly stated, Shankweiler and Fowler (2004) argue that when a participant readily picks up the skills of rhyme and alliteration, they have very little trouble in learning phonemic awareness and applying it to reading. They suggest a backward approach, which diverts the focus from phonological awareness as a starting point because phonemic awareness usually doesn't follow. Rhyming and even alliteration, when mastered, have been found to later aid reading and even spelling skills (Bryant et al., 1990; Goswami, 2002;).

Early Childhood Literacy Programming

Current Issues

Prior to understanding recommendations for effective literacy programming, it is necessary to understand the problems of current programming. Santi, Menchetti and Edwards (2004) in an overview of phonemic awareness programs, found four major weaknesses among research-based interventions. Among the first weaknesses that precluded teachers from effectively implementing the programs were that not all of the instructional materials were routinely provided and ways to measure that progress weren't included in the curriculum (Santi, Menchetti & Edwards, 2004). Additionally,

teachers were unable to provide feedback to participants or parents because proper supplementary materials weren't provided with the curriculum or specified as to their use (Santi, Menchetti & Edwards, 2004).

This difficulty has not only been seen in phonemic awareness training, but has also been seen in the reading intervention program, Success for All (SFA). Klinger, Cramer, Harry (2006) report difficulties in programming associated with fidelity of treatment implementation that resulted from incorrect placement of participants and participants in need of remedial services being stuck in a cycle of stagnation, the result not knowing enough to move forward in the curriculum. Fidelity was also a concern when teachers adapted the program to meet the needs of their participants, although participant's made more progress toward their goal of reading (Klinger et al., 2006).

Initial Recommendations

One of the biggest obstacles in early literacy programming is the ability to synthesize research and create a learning program appropriate for a target population. Early literacy programming often falls into 3 main categories (Juel & Minden-Cupp, 2000). Juel and Minden-Cupp (2000) in their analysis of early literacy programming state that often teachers and administrators choose programming that can be characterized along three dimensions. In tandem with this analysis, the authors also tested the programs' effectiveness on at-risk kindergarten participants. The first group of programming seeks to emphasize constructivism or the ability of a participant to use personal or contextual meaning to aid with decoding unknown words in text. The second group stresses the importance phonological decoding and the third highlights specific

linguistic units such as the phoneme, onset-rime pattern or syllables. The authors found that programming that combined characteristics from the second and third groups were more appropriate for at-risk participants. The kindergarten group that showed the most growth in word-reading ability was exposed to explicit instruction that concentrated on letter-phoneme, onset-rime and blending relationships.

Simply knowing the type of programming that is most effective and allows participants to make the largest gains isn't enough. Neuman (2006) also introduces five principles that can aid young children on the journey of learning and building basic knowledge frameworks. Several of these principles mirror the recommendation of the National Reading Panel as to how beginning literacy and reading should be taught (National Reading Panel, 2000). Based upon their recommendations and highlighting the themes of explicit and systematic instruction, content-centered classrooms (Neuman & Roskos, 1997) allow for literacy to serve as a framework to support the skills and functions necessary for navigating the beginning stages of reading. Integrated instruction, a concept that is often related to content-centered classrooms, can be defined as the organization of large amounts of content into meaningful concepts that are developmentally appropriate (Schickendanz, Pergantis, Kanosky, Blaney & Ottinger, 1997). Integrated instruction, which can be thought of as thematic teaching provides a more in-depth approach that helps children understand content. Lane et al. (2002) support the use of activities and games during instruction or non-instructional time as a way to explicitly teach skills when a lot of individualized instruction cannot occur on a regular basis. These activities can include singing, play activities, stories, poems, counting

syllables or phonemes in storybook characters or new vocabulary or spelling words. Additionally, modeling is a powerful way for teachers to become engaged and facilitate appropriate learning in the classroom (Lane et al., 2002).

Using another principle as a guide for classroom instruction, Neuman (2006) looks to the role of the teacher as a quality indicator in early literacy programs. Effective teachers not only aid children, but carefully scaffold children's learning, monitor each child's progress and encourage children to work on the edge of their competence (Neuman, 2006). Direct Instruction, a method for teaching that is used in many schools provides the vehicle to involve teachers in a higher concentration in the learning process. High levels of effective teacher and administrative interaction have been shown to be a great influence in helping children reach their potential (Carbo, 2005Kame'enui, 2001; Neuman, 2006).

Direct instruction programming such as Language for Learning, Corrective Reading and Reading Milestones are also methods that are most closely associated with explicit instruction in reading. It is a teaching model that emphasizes well-developed and carefully planned lessons that are clearly defined to facilitate small learning increments for the participant (Hill & MacMillan). The above programs are used in preventative or remedial reading programs. Direct instruction methods have been controversial, especially in comparison to discovery learning procedures (Dean & Kuhn, 2004). Direct Instruction has been proven to provide a variety of participants with the intensive, skill-building instruction that is needed to acquire or remediate participants' learning. It provides the opportunity for clear instruction without misinterpretations as to the learning

task, which leads to an acceleration in learning. Immediate feedback is provided to participants which allow a participant to learn skills, concepts and facts in a very direct manner (Hill & MacMillan). While Direct Instruction has been shown to provide at-risk participants with the boost in learning that is needed, Dean and Kuhn (2004) also found that in a direct instruction only condition, participants were found to have skill acquisition that followed a gradual pattern of acquisition and consolidation. Therefore, the boost in learning was found, but also maintenance of skills was a benefit of the explicit instruction condition

Motivation

Effective teachers look to provide learning experiences that help children become skillful navigators of the content as well as highly motivated to achieve (Guthrie & Humenick, 2004). It should not be forgotten that a child's competence is just as important as what and how a teacher delivers instruction. Motivation in terms of reading achievement can be defined as a multi-faceted set of goals and beliefs that an individual has regarding his or her reading achievement (Guthrie & Wigfield, 1999). This multi-faceted set of goals are grounded in internal and external motivation as well as self-efficacy (Guthrie & Humenick, 2004). As a participant is motivated to read, they learn to depend on systems outside of themselves to deliver reinforcement for reading, they learn to depend on the value and enjoyment found in reading and they begin to believe in their abilities as an efficient reader. Motivation to read cannot be discounted as a viable variable in reading success and Morgan and Fuchs (2007) found that reading skill level has a bi-directional relationship with reading motivation. In an analysis of research, the

authors found consistent support for the relationship in statistically significant correlations between a child's reading skills and competency beliefs. In a more tentative correlation, Morgan and Fuchs' analysis revealed the hypothesis that children's reading achievement and reading motivation predict each other across time (2007).

Reading programs have made the transition to follow the recommendations of the National Reading Panel (2000) and the National Early Literacy Panel (2007) in trying to reach the individual needs of its participants. Juel and Minden-Cupp (2000) found that explicit instruction and opportunities for extended practice with phonemically decodable texts were beneficial for children at-risk for reading failure. In this study, the authors examined the effect of instruction with an emphasis on phonics and phonemic awareness versus the traditional curriculum for participants who were considered at-risk or at grade level according to their reading ability. While the traditional program didn't deter typically-developing participants, those participants at-risk for reading failure were found to be at grade-level after having participated in the explicit instruction condition. Juel and Minden-Cupp (2000) state that their results support the use of differential instruction, explicit instruction in phonics and related skills as well as systematic instruction in all phonological skills.

Monitoring Progress

Assessment in the early childhood setting is neither a new or unique process (Roskos, 2004). Assessment of young at-risk participants gained momentum as the result of the Title I program, which required assessment on skills such as: oral language, alphabet knowledge, one-on-one correspondence, and motor ability. Assessment is

important in all areas of education, for it provides a basis for where to go and evidence of where the participant has been; it is a necessary method for systematically collecting and analyzing information on children's literacy development (Roskos, 2004). Quality assessment strategies are a mark of a high-quality program for it denotes a program's commitment to research-based instruction and a curriculum that reflects the developmental needs of the participant. Some may argue that the appearance of assessment isn't sufficient grounds to assume that instruction is guided, but this paper will look at programs that use assessment to make decisions regarding instruction. It should not be forgotten that the future trends in assessment are making it more the rule than the exception. Funding sources, demand from elementary schools and informed families are pushing the need for quality assessment strategies that can report the progress of children (Roskos, 2004).

Assessment doesn't come without its issues, for it can be a cumbersome and daunting task for the classroom teacher. Some may question the purpose, the reliability (McNamara, Scissions & Dahleau, 2005), and its appropriateness for young children (Roskos, 2004).

Informal Assessment: Progress Monitoring

Progress monitoring, when linked to explicit and direct instruction is an effective aid in making reliable instructional and placement decisions (Stecker & Fuchs, 2000). Curriculum-based measurement, a form of progress monitoring, is an important part of instruction that also satisfies the requirements and demands of a busy classroom by being easy and quick to administer (Vaughn & Roberts, 2007). Progress monitoring provides a

means of tracking the rate of participant achievement against the rate needed for grade-level benchmarks. It affords teachers the ability to repeatedly measure progress in a narrow amount of time without sacrificing validity (Deno, Fuchs, Marston & Shin, 2001; Vaughn & Roberts, 2007).

Monitoring progress serves to provide the classroom teacher with a variety of tools that can be added to his or her arsenal. Assessing instructional effectiveness provides not only an opportunity for the teacher to make curriculum-based decisions, but is also a way for teachers to incorporate participant motivation as a catalyst for achievement. The National Early Literacy Panel (2007) found that not only was assessment important and integral in literacy achievement, but that a stronger relationship was found when assessments happened early, such as during preschool years as opposed to after the beginning of school. Monitoring the progress of participants can be aligned along progressive monitoring or assessing instructional effectiveness.

Formal Assessments

Formal or standardized assessment is growing in popularity as accountability spreads into early childhood education. While there are several formal assessments (see Appendix C) that can test phonological awareness skills, the Early Childhood Research Institute on Measuring Growth and Development authored an assessment that is both quick and easy to use in order to measure beginning literacy skills. The Get It, Got It, Go (Early Childhood Research Institute on Measuring Growth and Development, 1998) is a formal assessment that can be used to assess picture naming, rhyming and alliteration skills. The picture naming section includes a sample picture naming stimulus card which

includes a target photo or line drawing in the center of each card (Appendix H). At each testing session, the participant is assessed for one minute.

The rhyming section includes a sample rhyming stimulus card which includes a target photo or line drawing at the top of each card and a set of photos or drawings, one of which rhymes with the target picture (Appendix I). For example, a photo of bees will be centered on the top line of the card. The bottom line of the stimulus card includes photos of pants, gate, and cheese. At each testing session, the participant is assessed for two-minutes. Prior to the start of the timer, the assessment includes two sample cards. The teacher uses the first as a demonstration and the second provides practice for the participant.

Alliteration skills are assessed much the same way as the rhyming skills for this indicator. The sample alliteration stimulus card includes one image at the top of the card and three images on the second row, one of which starts with the same sound as the target picture (Appendix J). For example, the top image is rose and the images included on the second row will be a shoe, ring and tub. At each testing session, the participant is assessed for two-minutes.

While the Get It, Got It, Go assessment tool isn't the only assessment strategy that will satisfy an easy, effective way to monitor the progress of participants, it provides an easy method to begin the process of monitoring participant progress within the classroom to guide instruction. Assessment strategies, while not new to early childhood education, are beginning to become a daily fixture in educational planning.

Conclusion

Kame'enui and Simmons (2001) state that there are good ideas and bad ideas in reading-the bad ideas centering around the notion that reading comes "naturally." This bad idea regarding reading can be validated empirically as all children do not learn to read naturally; there are children in every American classroom that struggle with reading and reading dependent skills such as spelling and writing. As with any reading instruction, phonics or whole language, it is important to remember that it is a means to an end and not the end in itself because eventually a sight-based strategy is the predominate way a participant's reading skills are refined (Mesmer & Griffith, 2006). Good readers comprehend how print represents speech sounds, phonics and phonemic skills are applied fluently, vocabulary and alternate language skills are effective in that they allow the participant to and through their reading to background knowledge and experiences (Lyon & Fletcher, 2001). Lyon & Fletcher (2001) also assert that those that are at-risk for reading failure tend to not display adequate phonological processing skills (which encompass phonemic awareness) and fail to develop an effective ability to read words. As stated previously, this type of reader is often frustrated and motivation to continue reading is virtually non-existent for the effort exerted to read is not met with excitement and rewarded with learning (Lyon & Fletcher, 2001).

James Thurber stated, "It is better to know some of the questions than all of the answers." While this review did not provide all of the answers in regards to prevention literature, it does provide focus as to which questions to ask in regards to preventing reading failure among at-risk participants. Several questions were presented in order to

concentrate this discussion on issues in reading. The primary question looked at the at-risk population and the assessment as to if special considerations are needed in teaching beginning reading. Subsequent questions highlighted the facilitation of this process. If teachers are to teach the at-risk population, what methods work most effectively, what skills should be targeted and how do educators make the change from reacting to instruction to acting with intent regarding special populations?

The information presented acknowledges that populations of participants who are at-risk for reading failure exist and without intervention they will most certainly become the population of participants that are served in special education programs and will qualify for remedial reading interventions. Through opportunities for interaction and their verbal ability, at-risk children respond best to explicit instruction that is systematic and reflects their individual progress and achievement. Explicit instruction provides the opportunity for error-less learning and intentional learning, providing the participant with the opportunity to learn, with great repetition, academic content. Explicit instruction in pre-reading follows the recommendations of the National Reading Panel and includes components of phonological awareness and building oral language skills. The last question points to one of the future trends of education as a whole, not just improving the reading skills of America's participants. Federal legislation centering on No Child Left Behind not only raised the bar for how children are instructed, but the origin of that instruction. Teachers no longer have the burden of making uninformed decisions regarding instructional aims, but can rely on assessment strategies to make sure that individual concerns are focusing daily instruction.

In an attempt to answer the above questions, this study will propose a comprehensive strategy for enhancing reading instruction. This study will focus on at risk participants and explicit instruction in the some of the skills highlighted by the National Early Literacy Panel (2007) and the National Reading Panel (2000) as critical to reading success (i.e., phonemic awareness, rhyme awareness and alliteration awareness). This study will look at monitoring progress and present a new version of a traditional format of an individual growth and development indicator (IGDI) the Get it, Got it, Go (GGG).

CHAPTER 3

METHOD

Setting

The learning center accepts children from a variety of socio-economic backgrounds. Participants in this study are enrolled in a preschool program with programming supplied by the Early Learning Initiative (ELI). ELI is a low-income program that provides families with quality childcare. ELI follows the same programming guidelines and standards as Head Start and is funded at the state level. Children are accepted into the program because their family meets the 120% poverty criteria established by the state of Ohio. The classroom also contains participants that serve as typical peers and are not qualified as at risk based upon socio-economic status (SES). All participants regardless of their family income receive the same programming in this classroom. A letter of support for the study will be obtained from the director (see Appendix D).

Participants

This study occurred at a preschool in a large metropolitan area. Six participants from a learning center in East Columbus were chosen for the study. Participants range in age from 4.2 years to 4.5 years of age and attend the learning center 5-days a week for the

full day. Participants selected to go through the screening process were recommended by the classroom co-teachers. Participants were recommended for this study based on factors such as regular attendance at school and an observed average or better rate of compliance in comparison to their peers. Participants selected to participate were not chosen based upon the need for support services in reading or other academically-related variables. Socio-economic status (SES) was not considered a requirement for participation except for the fact that participants were members of a classroom that included children who were eligible for subsidized childcare (ELI) and subsidized meal vouchers (Child and Adult Food Care Program [CACFP]). Therefore, participants in this study are from a variety of SES levels.

Screening Procedures

Children selected to participate in this study, (a) were enrolled in an Early Learning Initiative (ELI) classroom, (b) passed the Denver II (developmental screening test), (c) had no documented neurological, speech or emotional problems, and (d) had English as their first language. Comparison peers who were members of the same classroom were also selected for participation in the study. One comparison peer was selected as a typically developing peer (TYP) based upon high SES and a second peer was selected whose first language was Spanish (ELL).

Treatment Participants

This study included 3 boys and 3 girls. More than 75% of the participants were from culturally diverse families, including 3 African Americans, 1 Mult-racial, and 1 Hispanic participant (see Table 3.1). All participants were eligible for free or reduced-

price lunch as identified by the Child and Adult Care Food Program with the exception of one comparison participant. A letter explaining the study and seeking parental permission for their child to participate was given to each parent (see Appendix E). An oral solicitation was used to explain the study to the children and obtain their consent (see Appendix F). Both parents and children were told that their participation was voluntary and they could withdraw at anytime without consequences.

Participant	Age	Gender	Denver	Ethnicity	Free/Reduced Lunch	Study Status
Participant 1	4.2	M	Pass	African American	Free	Treatment
Participant 2	4.4	F	Pass	African American	Free	Treatment
Participant 3	4.5	F	Pass	Multi-Racial	Free	Treatment
Participant 4	4.5	M	Pass	African American	Free	Treatment
Participant 5	4.2	F	Pass	Caucasian	Private Pay	Comparison
Participant 6	4.3	M	Pass	Latino	Free	Comparison

Table 3.1. Demographic information and pretest scores for treatment and control participants.

Data Collectors

Primary Researcher

The primary researcher was a doctoral student in Special Education and applied behavior analysis at The Ohio State University. She completed her bachelor's degree in psychology at Hope College in Holland, Michigan in 2000. She completed a composite degree that incorporated degree programs from the psychology department as well as the education department. The result was a psychology degree with a focus on young elementary school children. During her undergraduate career and upon graduation, she was working as an instructional assistant and teacher at community agencies and parochial schools in the Holland and Grand Haven areas. She was appointed Minister of Children's Programs and served as a teacher in the parochial school. She also worked as a preschool teacher in a program for 4 years old participants and the Young 5's program, which is recognized as a school age program in conjunction with the local schools. During this time period, the Michigan Department of Education placed students who did not meet the age requirement for entrance into kindergarten in a young 5s classroom. Students from this classroom were tested at the end of the year and were granted placement into either kindergarten or first grade.

The primary researcher then began her career in Head Start as an advocate for children's services. In this position, she worked in tandem with the classroom teacher as the social service representative for the family in consultation meetings in the agency and for the agency if it was required. She enrolled in and graduated from Grand Valley State University. It was at this time that the primary researcher began to work solely in three

local school systems in the joint vocational system as the advocate and program coordinator for the pregnant teen and teen parent population who were enrolled in Early Head Start. Her primary research responsibilities were to work with teen parents and their children as well as pregnant teens and fathers-to-be in the areas literacy development and support, parenting as well as meeting the academic needs for parent and child.

In 2005, the primary researcher entered doctoral study at The Ohio State University. Prior to the beginning of study, she had relocated to central Ohio to create and implement a nationally accredited and state-rated (NAEYC & Step Up to Quality) program for young children. This program served children ages 6 weeks to 12 years of age. It is at this site where this research study took place. The primary researcher has been conducting descriptive studies and academic interventions in the areas of psychology and education since 1999.

Second Observer

The second observer for this study is a graduate of The Ohio State University (2005). She was a student in the department of Human Ecology and Child Development and was completing graduate work at The University of Phoenix in Early Childhood Education . She is the current administrator of the program.

Dependent Variables

The dependent variables for this study were participants' phonological skills (i.e., phonemic awareness, alliteration and rhyming skills), participants' maintenance of phonological skills, computer based skills and participants' attitudes. Phonological awareness skills were collected using a curriculum based measure (untimed). The Get It,

Got It, Go assessments (one and two minute timings) were conducted an average of third session for the rhyming and alliteration measures.

Phonological Awareness Skills

Phonological awareness encompasses many skills and concepts that are associated with early reading acquisition. Lane and colleagues (2002) associate phonological awareness with the ability of a participant to have awareness of words, syllables and phonemes. Lonigan (2006) defines phonological awareness as the ability to detect or manipulate the sound structure of language. Students who are found to be phonologically aware have the ability to produce rhyming words and segment words into syllables or onset-rimes. For this study, phonological awareness skills were defined across the categories of phonemic awareness, rhyming and alliteration skills. This study also employed a single skill instructional format (i.e., teaching phonemic awareness, rhyming and alliteration skills separately) and a multiple skill or discrimination instructional format (i.e., teaching the participant to discriminate the relationships among all of the skills).

Phonemic Awareness. Phonemic awareness is a skill that can be taught explicitly and separately from the overall skill of phonological awareness (Lonigan, 2006). Both Kame'enui and Simmons (2001) and the National Reading Panel (2000 define pure phonemic awareness training as involving the sounds of English (i.e., not letter-sound relationships).

Beginning phonemic awareness skills were measured by the ability of the participant to produce the correct phoneme or sound when presented with the vocal

prompt of the letter. The twenty-six short vowel sounds of the letters of the alphabet were used in this study. The experimenter presented participants with the vocal prompt (i.e. "A") and waiting 3 seconds for emission of the sound /a/. If participants responded correctly within 3 seconds, a response was recorded in the column marked corrects (see Appendix G). If participants responded incorrectly or after 3 seconds, a response was recorded in the column marked incorrects.

Rhyming. Rhyming skills are defined as when a participant is able to correctly identify words that have the same ending sound (e.g., cat, bat). The Get It, Got It, Go (Early Childhood Research Institute on Measuring Growth and Development, 1998) (see Appendix I), an Individual Growth and Development Indicator (IGDI) was used to assess rhyming skills. The IGDI used was the Get it, Got it, Go (GGG) assessment tool. The GGG involves three distinct parts: a model component, a sample assessment component and the formal assessment component. Each component involves the same card format. For example, a sample rhyming stimulus card included a target photo or line drawing at the top of each card and a set of photos or drawings, one of which rhymed with the target picture. For example, a photo of bees is centered on the top line of the card. The bottom line of the stimulus card includes photos of pants, gate, and cheese. If the participant pointed to (or pointed to and said) "cheese", the experimenter marked a correct response on the data collection sheet (see Appendix G). If the participant pointed to (or pointed to and said) "pants" or "gate" the experimenter marked an incorrect response. If the participant failed to respond then an incorrect response was recorded. At each testing session, the participant was assessed for two-minutes, which was calculated using a

timer/stopwatch. Prior to the start of the timer, the researcher used two sample rhyming cards for examples. The researcher modeled how to correctly respond to the card for the participant. The second sample card provided an additional model for each participant. Following the presentation of the sample cards, the experimenter selected four cards at random to present to the participant. Instructions accompanying the assessment recommended shuffling the cards prior to test administration to randomize presentation of the sample and test cards. The experimenter followed the above recommendation for test administration. Two cards were used to provide corrected feedback and two were used to provide uncorrected feedback according to administration guidelines. For corrected feedback the experimenter provided the correct answer to the cards answered incorrectly by the participant. No feedback was provided for the cards marked as uncorrected feedback. If the participant was unable to provide a correct answer to two or more cards, the notation of UNS (unable to sample) was recorded on the data sheet. Test administrators suggest that N/A be recorded on the recording sheet if the participant was unable to pass the sample assessment component. UNS (unable to sample) was used in this study in order to align with how Head Start reporting of scores is done through parent Head Start/ELI agency affiliated with this learning center. In an effort to discriminate between the difference of a participant who was not able to pass the initial sample assessment and a participant who received 0 corrects and 0 incorrects during a testing trial, the data points on the graph are different. For example, a solid/filled square (■) was used to denote an UNS assessment attempt and the traditional data point selected for incorrect responses, an unfilled circle (○) was used to denote a participant who passed the

sample assessment. The placement of the traditional data point (○) at the horizontal value denotes their score. Correct responses were denoted with a filled diamond (♦). Each correct and incorrect item the participant answers during the test session was recorded at the end of each assessment session.

Alliteration. Alliteration is the ability of the participant to correctly identify the words that begin with the same sound. Alliteration was measured using the Get It, Got it, Go assessment tool. The sample alliteration stimulus card included one image at the top of the card and three images on the second row, one of which started with the same sound as the target picture (see Appendix J). For example, the top image is a rose and the images included on the second row are a shoe, ring and tub. If the participant pointed to (or pointed to and said) "ring", the experimenter marked a correct response. If the participant pointed to (or pointed to and said) "shoe" or "tub" the experimenter marked an incorrect response. If the participant failed to respond then an incorrect response was recorded. At each testing session, the participant was assessed for two minutes, which was calculated using a timer/stopwatch. Prior to the start of the timer, the researcher used two sample alliteration cards for examples. The researcher modeled how to correctly respond to the card for the participant. The second sample card provided an additional model for each participant. Following the presentation of the sample cards, the experimenter selected four cards at random to present to the participant. Instructions accompanying the assessment recommended shuffling the cards prior to test administration to randomize presentation of the sample and test cards. The experimenter followed the above recommendations for test administration. Two cards were used to

provide corrected feedback and two were used to provide uncorrected feedback according to administration guidelines. For corrected feedback the experimenter provided the correct answer to the cards answered incorrectly by the participant. No feedback was provided for the cards marked as uncorrected feedback. If the participant was unable to provide a correct answer to two or more cards, the notation of UNS (unable to sample) was recorded on the data sheet. Test administrators suggest that N/A be recorded on the recording sheet if the participant was unable to pass the sample assessment component. UNS (unable to sample) was used in this study in order to align with how Head Start reporting of scores is done through parent Head Start/ELI agency affiliated with this learning center. In an effort to discriminate between the difference of a participant who was not able to pass the initial sample assessment and a participant who received 0 corrects and 0 incorrects during a testing trial, the data points on the graph are different. For example, a solid/filled square (■) was used to denote an UNS assessment attempt and the traditional data point selected for incorrect responses, an unfilled circle (○) was used to denote a participant who passed the sample assessment. The placement of the traditional data point (○) at the horizontal value denotes their score. Correct responses were denoted with a filled diamond (♦). Each correct and incorrect item the participant answers during the test session was recorded at the end of each assessment session.

Computer IGDI

A computerized version of the Get it, Got it, Go was developed by the researcher for use in this study (see Appendix K). The computerized version featured the same set of sample cards and test cards included in the study. The computerized version also

included a data collection feature and the ability to save the session of each participant. IOA data was collected for each session when the computerized version was used. Approximately 80% of the sessions involved only the primary observer/researcher collecting IOA and comparing it item by item to the computer records. Twenty percent of the sessions involved both observers collecting IOA data and comparing their results to the computer's results. The correct and incorrect participants' responses per condition were compared to determine the differences between the researcher's traditional use of Get it Got It Go and the computerized version. The computer IOA allowed for an analysis of the accuracy of the computer in collecting the data. The participants' dependent variable performances allowed for an analysis of any novelty effect that might occur.

Multiple Skill Instruction

Multiple skill instruction (or Discrimination training) involved explicitly teaching the participants how to differentiate between the three component phonological skills (phonemic awareness, rhyme awareness and awareness of alliteration) measured in this study. Previously each phonological skill was instructed in isolation. For 8 of the 10 trials per session, participants will be required to answer single opportunity cards. These cards will contain both rhyme opportunities and alliteration opportunities. Phoneme production opportunities were imbedded into the alliteration cards. Each participant was presented with a rhyme card (just like in the explicit instruction for rhyming). If the participant was presented was able to identify the two pictures on the card that ended with the same wound, his or her response was considered correct. All other responses or no response were considered incorrect. For alliteration cards, the participant was asked to first say the

sound of the first letter of the picture at the top of the card (i.e. /t/ for teeth) (see Appendix J). Each participant was asked (just like in the explicit instruction for alliteration) to identify the two pictures on the card that began with the same sound, if he or she correctly identified "teeth" and "tire," the response was recorded as correct. All other responses or no response were considered incorrect. For 2 of 10 trials, participants were required to answer triple opportunity cards. The three opportunities correspond with the opportunity to produce a beginning phoneme, an alliteration match and rhyming words.

Picture Naming

The Get it, Got it, Go (GGG) also includes a picture naming test which is used to assess the expressive language of participants through picture recognition. This variable was tracked for each participant for three reasons. Primarily, the picture naming measure was used to initially make the decision regarding implementation of the first intervention variable (phonemic awareness). This was done because most of the participants did not exhibit the ability to produce phonemes, rhyme or alliterate and therefore decisions based on stable responding could be strengthened using picture naming. Secondly, the picture naming measure was used to show a baseline measure for a variable throughout the entire study. This would reveal supportive information regarding a participants behavior if abnormal responding occurred. Lastly, this measure was used to see any auxiliary effects, if any, that the explicit instruction in the phonological awareness skills had on the ability of participants to correctly name picture or any effects that shared icons between the three

tests (picture naming, rhyming and alliteration) had on the ability of participants to recognize the icons.

The picture naming variable was measured by asking participants to correctly identify the picture or line drawing that was represented on the flash card. For example a flashcard would include the icon of a "fish" on one side and the word fish on the other (see Appendix H). This variable also included a model/sample assessment component and the assessment component. The directions accompanying the assessment stated that the four sample cards included with the assessment be used for the teacher to model the correct way to answer as well as the correct answer for each item. If the participant answered all four of the picture naming cards correctly during the sample assessment component, they were able to proceed with assessment administration. Instructions accompanying the assessment recommended shuffling the cards prior to test administration to randomize presentation of the sample and test cards. The experimenter followed the above recommendations for test administration. The four sample cards were used to model correct responding as well as the sample assessment for each participant. For corrected feedback the experimenter provided the correct answer to the cards answered incorrectly by the participant. If the participant was unable to provide a correct answer to two or more cards, the notation of UNS (unable to sample) was recorded on the data sheet. Test administrators suggest that N/A be recorded on the recording sheet if the participant was unable to pass the sample assessment component. UNS (unable to sample) was used in this study in order to align with how Head Start reporting of scores is done through parent Head Start/ELI agency affiliated with this learning center. In an

effort to discriminate between the difference of a participant who was not able to pass the initial sample assessment and a participant who received 0 corrects and 0 incorrects during a testing trial, the data points on the graph are different. For example, a solid/filled square (■) was used to denote an UNS assessment attempt and the traditional data point selected for incorrect responses, an unfilled circle (○) was used to denote a participant who passed the sample assessment. The placement of the traditional data point (○) at the horizontal value denotes their score. Correct responses were denoted with a filled diamond (♦). Each correct and incorrect item the participant answers during the test session was recorded at the end of each assessment session.

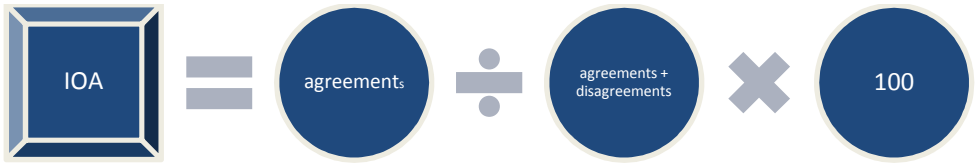
Maintenance

The maintenance of skills learned by the participants was measured using the same methods as described previously in regards to phonemic and phonological awareness using the curriculum based measures and Get It, Got It, Go. Maintenance data was taken for the phonemic and rhyme awareness conditions immediately after the conclusion of the respective conditions and alliteration skills were measured two weeks after the conclusion of the alliteration condition for each participant.

Interobserver Agreement (IOA)

IOA was collected by having a second observer present during the assessment of the dependent variables for approximately 50% of all assessments. The two observers sat so they both could see and hear the participant but so they could not see how each scored the participant's responses. The first and second observer then compared responses and disagreements were discussed item by item and recorded on the data sheet. For the

computer assessment when two observers participated in the session, IOA was calculated in the same manner. When a single observer used the computer, the observer marked correct responses as the assessment was being given and then compared the responses with those provided by the computer in order to determine agreements and disagreements. The calculation for IOA was as follows to determine the percentage of agreement for that session:



Questionnaires

Participant Questionnaire. At the conclusion of the study, the participants were asked a series of questions by a teacher at their learning center (see Appendix L). The social validity questionnaire involved the participants being asked 5 questions regarding the study. Participants were then asked to respond to the questions by point to a response card. This response card contained three responses that related to responses similar to "yes," "no" and "indifferent." Participants were given 3 faces to represent the above responses and were told the faces represented happy/liked it, sad/did not like it and no response (see Appendix M). The differences in the meaning were adjusted depending upon the question.

Teacher Questionnaire. At the conclusion of the study, the classroom teachers were given a questionnaire by the experimenter (see Appendix N). The experimenter obtained the answers from the teachers because the second observer and other support

personnel were in supervisory roles in relationship to the classroom teachers. This was done in an effort to reduce any confounding variables that might be obtained from the supervisor-employee relationship. Social validity involved the teachers being asked to respond to a Lickert-type questionnaire approximately 1 month after the conclusion of all study components (i.e., intervention and maintenance conditions).

Materials

1. *Get It, Got It, Go Assessment Tool*. This tool was available from the Get it, Got it, Go website (www.ggg.umn.edu). This assessment was used to measure rhyme and alliteration awareness for the study. The researcher obtained the tool at an administration training offered at the local special education resource and referral center. The tool can also be downloaded from the website and used without the training. The materials included are the rhyming cards, alliteration cards and picture naming cards as well as instruction for use and procedural checklists.

2. *Denver II Assessment Tool.* This tool was available from the local Head Start office. It was used as a prescreen for all participants to rule out developmental issues that may impact the outcome of the study. This tool was completed within 1 month prior to the start of the study.
3. *Locked File Cabinet for Assessment Data & Curriculum.* A locked file cabinet was used in order to keep confidential files and test materials safe. This locked file cabinet was provided by the site for use by the researcher. The researcher was provided a key for the cabinet.

4. *Computer Assessment Tool*. The computer assessment tool was created for use by this study. It was programmed to include exact replications of the traditional flashcards. Also included in the program are the options to use rhyming and alliteration cards sets, pre-randomized card presentation, participant selection for 10 participants (labeled A-J for re-use), data output of session and a save as feature for that data file.
5. *Computer for computer assessment*. An HP touchscreen laptop was used with the program. This type of computer was suggested by the original test creator.
6. *Timer/Stopwatch.* A stopwatch was used to time sessions for the rhyming and alliteration conditions. The stopwatch was started after simultaneously as the test administrator read the stimulus icon on the first card for the testing session.
7. *Data Sheet.* The data sheet used for the study included opportunities for recording procedural integrity data, participant and session information. The data sheet also included the opportunity to include IOA data. The data sheets were kept in a 3-ring notebook divided by participant for easy calculation and reference.
8. *Picture cards.* Picture cards were used for the rhyme and alliteration explicit instruction sessions. Picture cards were approximately 4" x 4" in size and included a single icon that represented a word. Picture cards were laminated.
9. *Game tokens.* Game tokens were used as an incentive after correct responses in instructional trials as well as to track correct responses during each 10-opportunity trials.

10. *Stickers.* Stickers were used as a incentive during the study. Participants were allowed to trade their game tokens for a sticker at the conclusion of each session with the researcher.
11. *Instructional Setting.* A separate room was used for this study session. Participants were pulled from the classroom and taken to this room for instructional and testing sessions through the study. This setting provided a quiet, distraction-free environment to carry out the study.

Independent Variables

The following section describes the instructional method for the explicit instruction in phonological awareness skills.

Explicit Phonemic Awareness Instruction

Beginning phonemic awareness skills were measured by the ability of the participant to produce the correct phoneme or sound when presented with the vocal prompt of the letter. The twenty-six sounds of the letters of the alphabet were used in this study. The instruction was presented in two phases: instruction and review. During the instruction format, the experimenter presented participants with a "song" which presents the name of the letter and then the correct pronunciation of the phoneme associated with the letter name ("A" goes "*/aaa/*", "B" goes "*/bbb/*"). This song was sung one time during each instructional period. During the review period, the presenter started with the vocal prompt (i.e. "A") and waiting 3 seconds for emission of the sound /a/. If participants responded correctly within 3 seconds, feedback in the form of verbal praise and the repetition of the pair ("A" goes "*/aaa/*") was given. If participants responded

incorrectly or after 3 seconds, correction was presented (i.e., the instructor modeled the correct response) and the participant was instructed to repeat the correct pair. When the participant said the correct response the researcher praised the participant. Participants were required to maintain responding at 15 correct phonemes for two consecutive sessions prior to moving to the rhyming condition.

Explicit Rhyming Instruction

Rhyming instruction involved rhyme matching and rhyme oddity training. This training used a game format. Rhyme matching, as explained by Troia, Roth and Graham (1998) involved the participant selecting out of four picture cards, or 1 card with four pictures, the two pictures whose names rhyme or "end with the same sound(s)." Participants were brought in to the room, one at a time and the researcher and participant sat across from each other at a small table. The researcher told the participant whether they were working on rhyme matching or oddity training. Oddity training related to identifying one picture whose name does not end in the same sound as the other pictures Troia, Roth & Graham, 1998). Prior to beginning the rhyme matching session, the participants were told that they would see a card and that there would be 4 pictures on the card (or 4 separate pictures) (see Appendix I). The participants were also told that the researcher would point to each picture and that after pointing to the picture the participant should say the name of the picture. The participants were also instructed that the researcher would ask them which pictures rhymed (i.e., have the same ending sound). Each trial started with the presentation of the card (or icons). The researcher pointed to each icon (for example, the picture of the house) and waited for the participant's

response. Correct responses prompted the researcher to move to the next icon. Incorrect responses prompted implementation of the correction procedure. If the participant responded incorrectly, the researcher said the name of the icon ("house") and asked the participant to repeat it ("say house)". If the participant's repetition was correct, the researcher praised the participant and moved to the next icon (i.e., mouse, desk and rake). Correction procedures were repeated for an incorrect response. After the icons or pictures were identified, the researcher asked the participant, "What rhymes with house?" Each trial consisted of two practice trials and 10 test trials. Participants were also tested on a rhyme oddity task which used the same picture word cards as above. Icon identification procedures followed the same format as above. At the end of the identification of icons, the researcher asked "which picture does not rhyme or sound the same?" Each trial consisted of two practice trials and 10 test trials. For each trial answered correctly, the participant was given a game token. At the end of the training period, the number of correct answers was graphed and along with incorrect responses by the participant. Participants were tested on rhyme oddity tasks one day, followed by rhyme matching the following day. This cycle continued throughout the rhyming condition. The game tokens were used to trade for a sticker at the end of the training session. Participants were required to establish stable responding to move from the rhyming condition into the alliteration condition.

Explicit Alliteration Instruction

Alliteration instruction involved matching and oddity training. This training used a game format. Participants were brought in to the room, one at a time and the researcher

and participant sat across from each other at a small table. The researcher told the participant whether they were working on matching or oddity training. Oddity training related to identification of the picture whose name did not begin with the same sound. Prior to beginning the matching session, participants were told that they would see a card and that there would be 4 pictures on the card (or 4 separate pictures) (see Appendix J). The participants were also told that the researcher would point to each picture and say the name of that picture. The participants were also instructed that the researcher would ask them which pictures showed words that alliterate (i.e., begin with the same sound). Each trial started with the presentation of the card (or icons). The researcher pointed to each icon (e.g., the picture of teeth) and waited for the participant's response. Correct responses prompted the researcher to move to the next icon. Incorrect responses prompted implementation of the correction procedure. If the participant responded incorrectly, the researcher said the name of the icon ("teeth") and asked the participant to repeat it ("say teeth)". If the participant's repetition was correct, the researcher praised the participant and moved to the next icon (i.e., phone, tire and blocks). Correction procedures were repeated for an incorrect response. After the icons or pictures were identified, the researcher asked the participant, "What alliterates with teeth?" Each trial consisted of two practice trials and 10 test trials. Participants were also tested on an alliteration oddity task which used the same picture word cards as above. Icon identification procedures followed the same format as above. At the end of the identification of icons, the researcher asked "which picture does not alliterate or start with the same sound?" Each trial consisted of two practice trials and 10 test trials. For each

trial answered correctly, the participant was given a game token. At the end of the training period, the number of correct answers was graphed and along with incorrect responses by the participant. Participants were tested on alliteration oddity tasks one day, followed by alliteration matching the following day. This cycle continued throughout the alliteration condition. The game tokens were used to trade for a sticker at the end of the training session. Participants were required to establish stable responding to move from the alliteration training into discrimination training.

Discrimination Training

Discrimination or multiple skill training among the phonological skills was the final intervention phase in the study. Instruction followed the same pattern as outlined in the separate intervention phases prior to this condition. Additionally the participants were taught the difference between each of the component skills (i.e., phonemic awareness, rhyming awareness and awareness of alliteration). For the first part of this training session, participants were told that they would have to rhyme, alliterate and produce the correct phoneme at the introduction of the alliteration cards. The participants were presented with the same cards used for explicit instruction in the rhyme and alliteration phases (see Appendices I & J). In this condition the cards were mixed and shuffled and randomly presented. In order to re-train phoneme production, an additional step was required for the alliteration cards. This was the compound skill required during this training. For example, if the card had picture icons of a "rose" as the stimulus picture and "ring", "ball", "cup" on the second row, the experimenter read the stimulus picture and then added the prompt, "R goes /r/" and waited for the participant to produce a response.

The correction procedures for the phoneme training were followed. After this step, the stimulus word was repeated and the three pictures at the bottom of the card were read. The researcher asked the participant which picture names start with the same sound? The correction procedures for the alliteration training were followed. This phase of training consisted of eight trials.

The last two cards in the trial were introduced as the daily double cards. On these cards, there were words that required discrimination of rhyming skills and alliteration skills. The participants were required to find each of the skills in the card. For example, a trial card would have the stimulus word "ring" and the images of a "rose," "swing" and "cat." The participant would have to first produce the initial phoneme represented by the stimulus icon and then find the picture that began with the same sound (alliteration skill) and the picture that ended with the same sound (rhyming skill) with the stimulus icon. The participant was not required to produce each skill (i.e., rhyme and alliteration) in a particular order after the production of the phoneme.

Treatment Integrity (TI)

Treatment integrity, or procedural fidelity offer readers information as to the extent that the independent variables were applied during treatment phases (Cooper, Heron, Heward, 2008). In order to accomplish this goal, a procedural checklist was completed during each session by the researcher and recorded on the corresponding data sheet (see Appendices G & O). The data sheet used by the second observer had the treatment integrity checklist on one side and the data sheet on the other. Checklists for the curriculum-based measure were created by the researcher. The checklists for rhyme and

alliteration awareness were taken from the materials available with the GGG assessment tool. On approximately 50% of the sessions the second observer completed the respective checklists. That is, the second observer would check-off each behavior as it was completed. The two checklists for that session were compared on an item by item basis to determine procedural integrity (i.e., item-by-item agreement on the number of steps completed). Procedural integrity was calculated as follows to determine the percentage of agreement for that session.

Experimental Design

A multiple baseline design across skills was used in this study. The multiple baseline design is one of the most widely used designs for evaluating treatment effects in applied behavior analysis (Cooper, Heron & Heward, 2007). The authors characterize this design as having a time-lagged application of the treatment variable across technically different or independent behaviors. Each participant entered the first condition, baseline, after assessment using the Denver II and Get it, Got it, Go. The primary intervention phase consisted of explicit phonemic awareness training (PA). After stable responding had occurred, each participant entered the 2nd intervention phase, explicit rhyming awareness (REI). Stable responding is defined as a consistent data pattern that allows the researcher to predict future data within a range if the experimental conditions remain the

same (Cooper, Heron & Heward, 2007). The 3rd, intervention phase included explicit alliteration training (AEI).

The researcher also embedded an ABAC design for two of the dependent variables (phonemic awareness and rhyme awareness), prior to the final intervention condition (i.e., discrimination instruction) and maintenance. This design is characterized by four consecutive phases: (A) an initial phase prior to intervention application, (B) the application of the 1st intervention and (A) the removal of the intervention or a return to baseline and, (C) the application of the 2nd intervention (Cooper, Heron & Heward, 2007). The return to baseline design will be denoted with ABAC for the phonemic awareness and rhyme awareness conditions.

For the alliteration awareness condition, an ABC design was used. This design is characterized by three consecutive phases: (A) an initial phase prior to intervention application, (B) the application of the 1st intervention and (C) the application of the 2nd intervention. The return to baseline design will be denoted by ABC for the alliteration awareness condition. Each participant entered the first condition baseline after assessment using the Denver II. The study was conducted over a 25-week period.

General Procedures

Initial assessments

The initial assessment was the Denver II in order to determine if the participant has developmental issues that would prohibit their participation in the study. For example, attention deficiencies that prevented the child from being able to focus on instructional stimuli. After a participant passes the Denver II, they were assessed with the

Get It, Got It, Go assessment tool in order to determine their skill level prior to intervention.

Training data collectors

Data collectors were trained prior to the beginning of the study. The researcher was the primary data collector for this study. Secondary data collectors were a program assistant/administrator who had gone through OSU-IRB training and were trained for reliability purposes. The researcher introduced the concept of phonemic awareness. The training focused on how to set up the small group or individual instruction group, how to teach the lesson as well as reviewing the performance measures outlined prior to the beginning of the study. Mastery will be measured by the researcher based upon the five sessions in which all 26 sounds were scored correctly. The observer will also have to produce all sounds in five sessions.

Rhyming and alliteration training began with explaining each skill. For example, a rhyming match was explained as a pair of words that ended with the same sound (i.e., bat, cat). An alliteration match was described as a pair of words that began with the same sound (i.e., ring,rose). The researcher trained each observer on being able to decipher between rhyming oddity, rhyming matching, alliteration oddity and alliteration matching tasks. Each data collector was trained on how to implement the game format. Data collectors were trained on correct (in middle of table) or incorrect (cards overlapping) card placement, how to pose the question as it pertains to the specific skill ("ring rhymes with _____). Finally, each observer was trained to teach each child to graph participant progress.

Baseline

Data during the initial baseline was taken for several weeks to establish the skill level for each participant as a result of the current literacy and reading instructional practices in the classroom. Literacy practices in the classroom were comprised of having books available to read, recognition of names (self and friends) and fingerplays that were done at circle time. Fingerplays are songs in which children also have arm movements that accompany the words of the song. After stable responding occurred in this condition, each participant was allowed to enter the intervention phase. Each participant was assessed each session on phoneme production, rhyming and alliteration skills using the curriculum-based measure or the Get it, Got it, Go.

Explicit Instruction Interventions

Intervention consisted of implementation of the explicit instruction conditions starting with phonemic awareness and then rhyming and alliteration. For the phonemic awareness condition, participants were required to maintain responding at 15 correct phonemes for two consecutive sessions prior to moving to the rhyming condition. Participants were required to maintain stable responding to move from the rhyming condition into the alliteration condition and to move out of the alliteration condition into the discrimination condition. The discrimination condition required the participant to meet stable responding as well as a level of 15 correct phonemes for two consecutive sessions before training ceased. Participants could earn tokens for correct responding that could be traded in for stickers at the end of each session. For each correct response the participant could earn a token.

Each session followed the same format throughout the study. Prior to getting each participant from the classroom, the researcher set out that session's materials. Session materials for phoneme training are defined as the stopwatch, the notebook with data sheets and game tokens. Session materials for the rhyme, alliteration and discrimination training constituted a stopwatch, notebook with data sheets, game tokens and picture cards. Materials for assessment sessions included a stopwatch, notebook with data sheets, computer, computerized GGG and traditional format of the GGG.

Phoneme instruction. During the instruction format, the researcher engaged each participant in singing the letter-sound song. The researcher presents the name of the letter and then the correct pronunciation of the phoneme associated with the letter name ("A" goes "/aaa/", "B" goes "/bbb/"). This song was sung twice during each instructional period. During the review period, the presenter stated with the vocal prompt (i.e., "A") and waited 3 seconds for the emission of the sound /a/. If participants responded correctly within 3 seconds, feedback in the form of verbal praise and repetition of the pair ("A" goes "/a/") was given. If participants responded incorrectly or after 3 seconds, correction was presented (i.e., the researcher modeled the correct response) and the participant was instructed to repeat the correct pair. When the participant said the correct response the researcher praised the participant. The researcher would assess each participant at the end of each session on phonemes. Finally, the researcher would return the participant to his or her classroom and bring another participant to the room for instruction.

Rhyming instruction. Each participant was brought into the room and the researcher and participant sat across from each other at a small table. The researcher told

the participant whether they were working on rhyme matching or oddity training. Oddity training meaning identification of the picture whose name did not end in the same sound as the other pictures. The researcher would model the skill and then have the participant practice responding to the picture cards. The researcher pointed to each icon (for example, the picture of the house) and waited for the participant's response. Correct responses prompted the researcher to move to the next icon. Incorrect responses prompted implementation of the correction procedure. If the participant responded incorrectly, the researcher said the name of the icon ("house") and asked the participant to repeat it ("say house)". If the participant's repetition was correct, the researcher praised the participant and moved to the next icon (i.e., mouse, desk and rake). Correction procedures were repeated for an incorrect response. After the icons or pictures were identified, the researcher asked the participant, "What rhymes with house?" Each trial consisted of two practice trials and 10 test trials.

Alliteration instruction. The researcher told the participant whether they were working on alliteration matching or oddity training. Oddity training meaning identification of the picture whose name did not begin with the same sound. The researcher would model the skill and then have the participant practice responding to the picture cards. The researcher pointed to each icon (for example, the picture of teeth) and waited for the participant's response. Correct responses prompted the researcher to move to the next icon. Incorrect responses prompted implementation of the correction procedure. If the participant responded incorrectly, the researcher said the name of the icon ("teeth") and asked the participant to repeat it ("say teeth)". If the participant's

repetition was correct, the researcher praised the participant and moved to the next icon (i.e., phone, tire, blocks). Correction procedures were repeated for an incorrect response. After the icons or pictures were identified, the researcher asked the participant, "What starts with the same sound as teeth?" Each trial consisted of two practice trials and 10 test trials.

Baseline 2

After explicit instruction concluded in phonemic awareness and rhyme awareness, the participants were moved in to their second baseline condition. The baseline 2 conditions were the same as the initial baseline condition. After the phonemic awareness explicit instruction condition, participants were being instructed in rhyme awareness and therefore were not receiving training in production of phonemes. Baseline 2 also occurred after the conclusion of rhyme awareness training when participants were being instruction in awareness of alliteration. Participants did not enter another baseline condition after the conclusion of alliteration instruction and instead went directly into discrimination training. The criteria for movement into the next phase were stable responding in the skill being trained. Data was also collected in the dependent variables not being trained at the time. Session materials for data collection were the computerized GGG, the traditional format of the GGG, stopwatch/timer, notebook with data sheets and computer.

Discrimination Training

Discrimination or multiple skill training included the explicit instruction of the three component phonological awareness skills in this study (phonemic awareness, rhyme

awareness and awareness of alliteration). Participants were also taught the difference between the three skills as well as the characteristics of their relationship (i.e., when doing alliteration you are matching the initial sounds in word which are a phoneme). The relational aspects between phoneme production and alliteration skill were referred to as compound skill training. Each participant was presented with a rhyme card and asked to identify the two pictures on the card that ended with the same sound his or her response was considered correct. All other responses or no response were considered incorrect. The correction procedure of the researcher modeling the correct response and then requesting the participant to repeat that correct response was used. For alliteration cards the participant was asked to first say the sound of the first letter of the picture at the top of the card (i.e, /t/ for teeth) (see Appendix J). Each participant was asked to identify the two pictures on the card that began with the same sound, if he or she correctly identified "teeth" and "tire" the response was recorded as correct. All other responses or no response were considered incorrect. The correction procedure was implemented for wrong or no response. For 2 of 10 trails, participants will be required to answer triple opportunity cards. The three opportunities per instructional card correspond with the opportunity to produce a beginning phoneme, an alliteration match, and rhyming words.

Criteria for this phase were the same for the explicit instruction interventions such as two sessions at 15 phonemes correct or higher and stable responding for rhyme and alliteration responding. Session materials constituted a stopwatch, notebook with data sheets, game tokens and picture cards. Materials for assessment sessions included a

stopwatch, notebook with data sheets, computer, computerized GGG and traditional format of the GGG.

Maintenance

Maintenance conditions were the same as baseline conditions. At the conclusion of the study, each participant was assessed by the Get it, Got it, Go in order to determine their current level of phoneme production, rhyming and alliteration. Maintenance for phoneme production and rhyming occurred immediately following the end of intervention during the subsequent commencement of the next skill selected for instruction. Maintenance for alliteration skills were assessed 2-3 weeks following the conclusion of all intervention sessions (with the exception of Participant 6 who suspended his participation in the study for 6 weeks while in the Dominican Republic). The other component phonological skills were also tested at this time.

Social Validity

The participants and teachers were given a confidential questionnaire in order to determine whether or not this intervention works well in the preschool classroom (see Appendices L & M). Schwartz and Baer (1991) state the purpose of taking social validity measures will be to determine whether or not this intervention is acceptable or viable according to the consumers (i.e., participants & teachers). According to their recommendations, assessment of the program was collected from the direct and indirect consumers. This information was used to answer the research questions of whether this intervention is a viable option for use in at-risk preschool programs.

CHAPTER 4

RESULTS

This chapter represents the results of the study. This chapter addresses the effect of the explicit instruction in phonological skills on the academic skills of the participants. This chapter will also address the result of the social validity assessments requested of the classroom teachers and participants. This chapter will be presented in the following sections: (1) interobserver agreement data (2) procedural integrity checks (3) general results for phonemic awareness instruction (PEI), rhyming explicit instruction (REI) and alliteration explicit instruction (AEI) with the inclusion of the social validity measures and (4) computer assisted technology results and (5) maintenance results of the instructed skills.

Interobserver Agreement (IOA)

Interobserver agreement (IOA) data were collected by the second observer for all participating participants across all conditions. IOA was conducted for at least 50% of the observational sessions across all conditions. All maintenance data were observed by the second observer. Table 4.1 summarizes interobserver agreements for all conditions in the study. For some participants, the skill was unable to be sampled (UNS) in the initial baseline condition before explicit instruction occurred. The second observer was present to check for integrity of administration of the assessment of skills. No interobserver

agreement is reported for the conditions that were marked UNS. Participant 6 was not able to pass the initial testing and therefore does not have any IOA to report for the rhyming condition. Baseline sessions are identified as the original baseline phase as well as the return to baseline condition following removal of the independent variable. Intervention sessions are identified as the initial explicit instruction condition as well as the phase containing discrimination training. Maintenance sessions are identified as the 2 sessions following the completion of all training at the conclusion of the intervention phases of the study.

Phonemic Awareness

Participant 1. The baseline data for Participant 1 was observed for 13 out of 18 sessions (72.2%) of the sessions. Mean agreement was calculated at 97.1% with a range of 80% - 100%. The second observer viewed 5 of 8 or 62.5% of sessions during explicit phonemic awareness instruction and discrimination training. Agreement of 98% for Participant 1 was obtained with a range of 90% - 100%. All maintenance sessions were observed for Participant 1 and agreement was calculated at 100%.

Participant 2. The baseline data for Participant 2 was observed for 19 out of 22 sessions (90.9%) of the sessions. Mean agreement was calculated at 98.3% with a range of 66.7% - 100%. The second observer viewed 6 of 11 or 54.5% of sessions during explicit phonemic awareness instruction and discrimination training. Agreement of 92.1% for Participant 2 was obtained with a range of 60% - 100%. Ninety-five percent of maintenance sessions were observed for Participant 2 and agreement was calculated at 90.9%-100%.

Participant 3. The baseline data for Participant 3 was observed for 15 out of 18 sessions (83.3%) of the sessions. Mean agreement was calculated at 99.3% with a range of 91.6% - 100%. The second observer viewed 5 of 8 or 63.6% of sessions during explicit phonemic awareness instruction and discrimination training. Agreement of 100% for Participant 3 was obtained. All maintenance sessions were observed for Participant 3 and agreement was calculated at 100%.

Participant 4. The baseline data for Participant 4 was observed for 8 out of 13 sessions (61.5%) of the sessions. Mean agreement was calculated at 100%. The second observer viewed 3 of 5 or 60% of sessions during explicit phonemic awareness instruction. Agreement of 100% for Participant 4 was obtained. Participant 4 was not available for maintenance sessions.

Participant 5. The baseline data for Participant 5 was observed for 13 out of 23 sessions (56.5%) of the sessions. Mean agreement was calculated at 99% with a range of 87.5% - 100%. The second observer viewed 6 of 10 or 60% of sessions during explicit phonemic awareness instruction and discrimination training. Agreement of 97.6% for Participant 5 was obtained with a range of 95.2% - 100%. All maintenance sessions were observed for Participant 5 and agreement was calculated at 100%.

Participant 6. The baseline data for Participant 6 was observed for 13 out of 17 sessions (76.5%) of the sessions. Mean agreement was calculated at 92.3% with a range of 93.8% - 100%. The second observer viewed 7 of 10 or 70% of sessions during explicit phonemic awareness instruction and discrimination training. Agreement of 92.8% for Participant 6 was obtained with a range of 50% - 100%.

Participant Name	Baseline Sessions;mean(range)	Intervention Sessions;mean(range)	Maintenance Sessions; mean(range)
Phonemic Awareness			
Participant 1	72.2; 97.1 (80-100)	62.5; 98 (90-100)	100; 100
Participant 2	90.9; 98.3 (66.7-100)	54.5; 92.1 (60-100)	100; 95.5(90.9-100)
Participant 3	88.3; 99.3(91.6-100)	63.6; 100	100;100
Participant 4	61.5;100	60;100	n/a
Participant 5	56.5; 99(87.5-100)	60; 97.6 (95.2-100)	100;100
Participant 6	76.5;92.3(93.8-100)	70; 92.8(50-100)	100;100
Rhyming			
Participant 1	53.8; 98.5 (90.0-100)	100; 99.7 (96.1-100)	100;100
Participant 2	100;100	100;100	100;100
Participant 3	100; 97.9 (93.7-100)	100: 100	100;100
Participant 4	UNS;n/d	75; 99.2 (94.7-100)	
Participant 5	44.4;100	86.6; 95 (95.4-100)	100; 100
Participant 6	UNS	UNS	UNS
Alliteration			
Participant 1	53.8;100	77.7; 100	100;100
Participant 2	UNS	100;99.1 (99.6-100)	100;100
Participant 3	UNS	100;98.5 (94.1-100)	100;100
Participant 5	60;98.9 (87.5-100)	66.6;100	100;100
Participant 6	UNS	50;100	100;100

Table 4.1. Interobserver agreement scores for each participant by dependent variable.

Rhyming Instruction

Participant 1. Fifty-four percent of sessions were observed for baseline conditions for Participant 1. The second observer was present for 7 of 13 sessions. IOA data were calculated at 98.5 (90%-100%). Thirteen sessions included rhyming instruction (including discrimination training) and the second observer was present for all sessions. The agreement was 99.7% with the range from 96.1 to 100 percent. Maintenance agreement was 100% and all sessions were observed.

Participant 2. All six of Participant 2's sessions were observed for all rhyming conditions. Agreement for these sessions was 100%.

Participant 3. The second observer was present for all sessions during all conditions. IOA data were calculated at 97.9% (93.7%-100%) for Participant 3's baseline conditions. Interobserver agreement was 100% for the resulting conditions.

Participant 4. Participant 4 was not present for the return to baseline condition and did not exhibit the skill during the original baseline. Sixty-seven percent of training sessions were observed by the second observer. Agreement was obtained at 99.2% with a range of 97.4% - 100%.

Participant 5. Forty-four percent of sessions were observed for baseline conditions for Participant 5. The second observer was present for 8 of 18 sessions. IOA data were calculated at 100% for baseline and instructional conditions. All of Participant 5's instructional sessions were attended by the second observer. Maintenance agreement was 100% and all sessions were observed.

Participant 6. Participant 6's scores for this skill were unable to be sampled.

Alliteration Instruction

Participant 1. Fifty-four percent of sessions were observed for baseline conditions for Participant 1. The second observer was present for 11 of 17 sessions. IOA data were calculated at 100%. Nine sessions included alliteration instruction (including discrimination training) and the second observer was present for seven of those sessions. The agreement was 100%. Maintenance agreement was 100% and both sessions were observed.

Participant 2. All 10 of Participant 2's sessions were observed for all alliteration conditions. Agreement for these sessions was 99.1% and the range was 99.6%-100%). Maintenance agreement was also calculated at 100% for both of Participant 2's sessions.

Participant 3. The second observer was present for all sessions during the alliteration and training discrimination conditions. Participant 3 had 10 alliteration sessions and 2 maintenance sessions. IOA data for intervention were calculated at 91% with a range of 94.1%-100%. Interobserver agreement was 100% for maintenance.

Participant 4. Participant 4 did not participate in this condition.

Participant 5. Sixty percent of sessions were observed for baseline conditions for Participant 5. The second observer was present for 12 of 20 sessions. IOA data were calculated at 98.9% for baseline and instructional conditions; the range was from 87.5% to 100%. Sixty-six percent of Participant 5's instructional sessions were attended by the second observer. Maintenance agreement was 100% and both sessions were observed.

Participant 6. The second observer was present for 50% of sessions across the alliteration and discrimination training conditions. Agreement was calculated at 100% for these sessions. Maintenance agreement was 100% and both sessions were observed.

Independent Variables

This section provides results of the treatment integrity measures as well as individual participant results. This section is organized by first presenting the fidelity of the independent variable. Next, individual participant data and mean scores of performance are addressed.

Treatment Integrity

Treatment integrity was assessed at the same time that interobserver agreement sessions were planned. Treatment integrity was assessed by the second observer completing the same checklist as the experimenter and recording the number of steps completed for each participant per session. The second observer completed the fidelity checklists as well as took data during the sessions. The second observer was present for 72.4% of sessions and agreement as to the percentage of steps completed per session was calculated at 100%.

Participant 1

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 1 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 1 was unable to produce phonemes. Therefore his mean was zero with a range of zero.

Intervention. Following a baseline condition of 4 sessions, intervention began for Participant 1 on the 5th session of the study (see Figure 4.1). Instruction on phoneme production lasted for 4 sessions. Participant 1's mean score was 10 correct phonemes out of 26 phonemes, his range was 0-18. Participant 1's 4 sessions lasted over a 2-3 week period as he had an extended absence due to illness. That same extended absence occurred between the last instructional session and the beginning of Participant 1's return to baseline.

Baseline 2. Participant 1's mean score for the return to baseline was 6.8 correctly identified phonemes, his range was 3 to 14, over 14 sessions.

Discrimination Training. Following Baseline 2, Participant 1 was explicitly instructed in accurately discriminating between the component phonological skills which included more explicit instruction in phonemic awareness. During 4 discrimination training sessions, Participant 1 scored a mean of 14.25 phonemes correctly with a range of 10 to 19.

Maintenance. Maintenance conditions were the same as Baseline conditions. Maintenance occurred 2 weeks after the last intervention session. Participant 1's mean score during 2 maintenance sessions was 17.5 with a range of 17-18.

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 1's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This

assessment was used for all sessions and across all conditions. He was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. He received a UNS when he was unable to answer the 4 card sample (see Figure 4.1). Participant 1 received a numeric score representing his performance in terms of correct and incorrect responses when he passed the sample card and began test administration.

Baseline. Participant 1's mean baseline score for 8 sessions was 4.8 corrects and 5.1 incorrect responses, his range was 2 to 7 for corrects and 2-13 for incorrects.

Intervention. After the beginning of explicit instruction in rhyme, Participant 1 was able to increase his mean score to 11.4 correct responses (range 8-18) and an average of 2 incorrect responses (range 0-3). Intervention lasted for 9 sessions.

Baseline 2. After intervention, Participant 1 was in Baseline 2 for 5 sessions and his responding decreased to an average of 7.4 correctly identified matches (range 6-9) and 2.6 incorrect responses (range 1-4).

Discrimination Training. Discrimination training was implemented for 4 sessions, Participant 1's mean increased to 21.3 correct responses (range 19-25) and 1.3 incorrectly paired matches (range 1-2).

Maintenance. During Maintenance conditions, Participant 1's responding demonstrated a small decrease to 17.5 correct responses (range 16-19) and a rate of 0 (range 0) incorrect responses for 2 sessions that occurred 2-3 weeks after the conclusion of discrimination training.

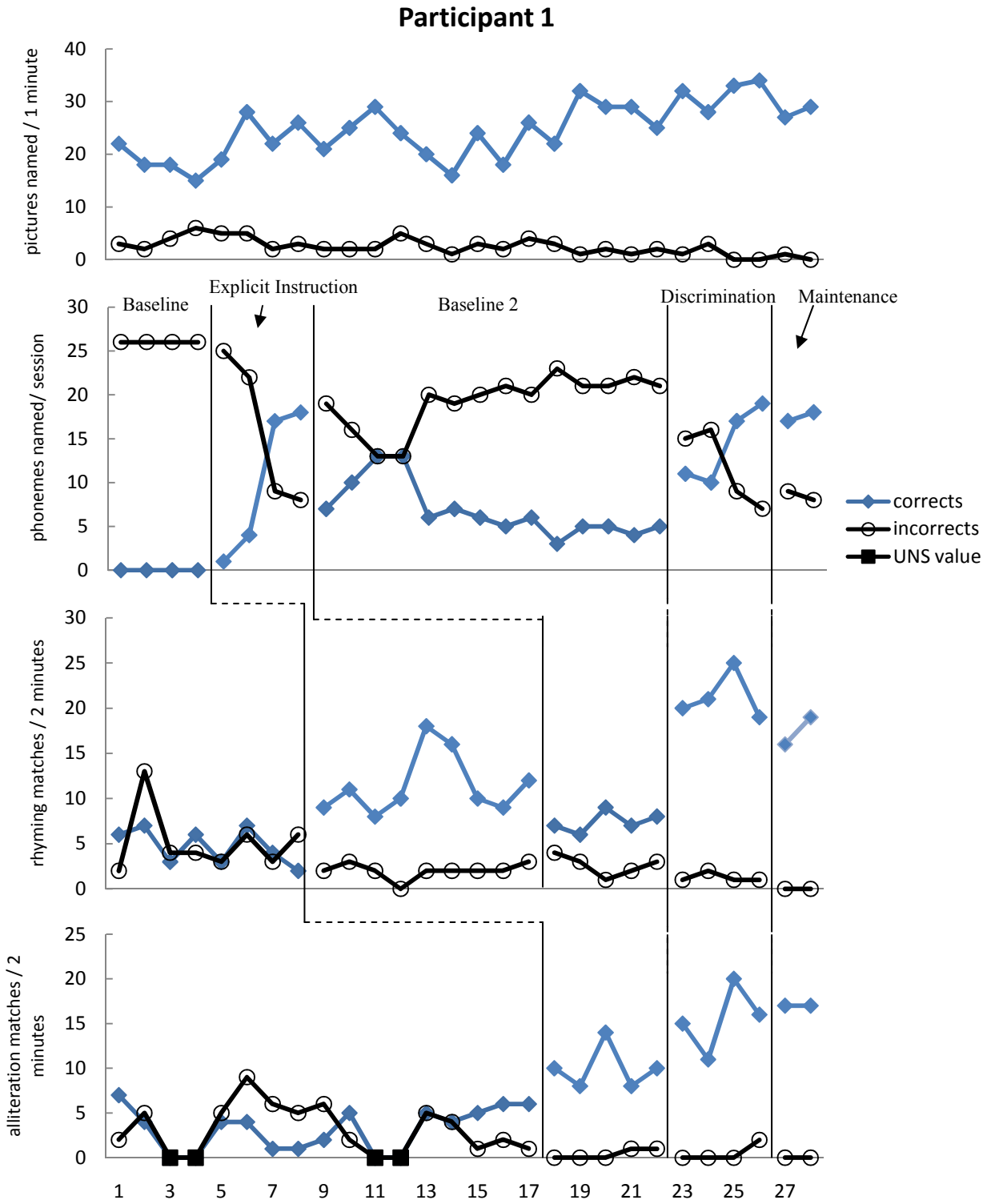


Figure 4.1. Participant 1's Overall Data

Notes: UNS – did not pass sample assessment

Alliteration Explicit Instruction

Alliteration skill was measured through Participant 1's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. He was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 1 received a UNS when he was unable to answer the 4 card sample (see Figure 4.1). Participant 1 received a numeric score representing his performance in terms of correct and incorrect responses when he passed the sample card and began test administration.

Participant 1. Participant 1's mean score across 17 sessions was 4.2 correctly identified matches (range 0-7) with an error average of 4 (range 0-9) per session.

Intervention. On the 18th session of the study, Participant 1 began explicit instruction in alliteration. Across the next 5 sessions, Participant 1 more than doubled his mean score from baseline with an average score of 10 correct responses, with a range of 8-14, and less than an average of 1(.4, range 0-1) incorrect response across those sessions.

Baseline 2. The explicit instruction condition was immediately followed by discrimination training and therefore there was no removal of instruction (i.e., Baseline 2) on alliteration.

Discrimination Training. Discrimination training was implemented for 4 sessions, Participant 1's mean increased to 21.3 correct responses (range 19-25) and 1.3 incorrectly paired matches (range 1-2).

Maintenance. Maintenance revealed an actual score of 17 correct alliteration matches for both sessions and no incorrect responses observed during the assessment periods.

Multiple Skill Training

Figure 4.2 shows the results of the component phonological awareness intervention on Participant 1's skill level in comparison with the discrimination training. In terms of his ability to produce phonemes when presented with the vocal prompt, during the explicit instruction condition, Participant 1's mean score was 10 phonemes correctly produced per session, his range was 1 to 18. Participant 1's mean incorrect score was 16, with a range of 8 to 25. With the introduction of discrimination training, Participant 1's mean of correct responses increased to 14.3, with a range of 10 to 19, and his incorrect productions fell to 11.8 (range 16 to 7). Participant 1 saw similar results with his ability to select rhyme matches after the discrimination training. His skill level during explicit instruction was an average of 11.4, with a range of 8-18 correct responses and that almost doubled resulting in a 21.3 mean score of correct responses (range 19 to 25) during discrimination training. Incorrect responses only saw a small decrease from explicit instruction to discrimination with mean scores of 2.0 (range 8 to 18) and 1.3 (range 1 to 7) respectively. Participant 1's alliteration difference for correct responses was 5.5 with 10.0 correct responses (a range of 8 to 14) being his average during explicit instruction and 15.5 (range of 11 to 20) being his mean score for discrimination training. His incorrect responding saw a difference of .01 as a mean as Participant 1 received less

than 1 as an average score for incorrects during both explicit instruction (range 0 to 1) and discrimination training (range 0 to 2).

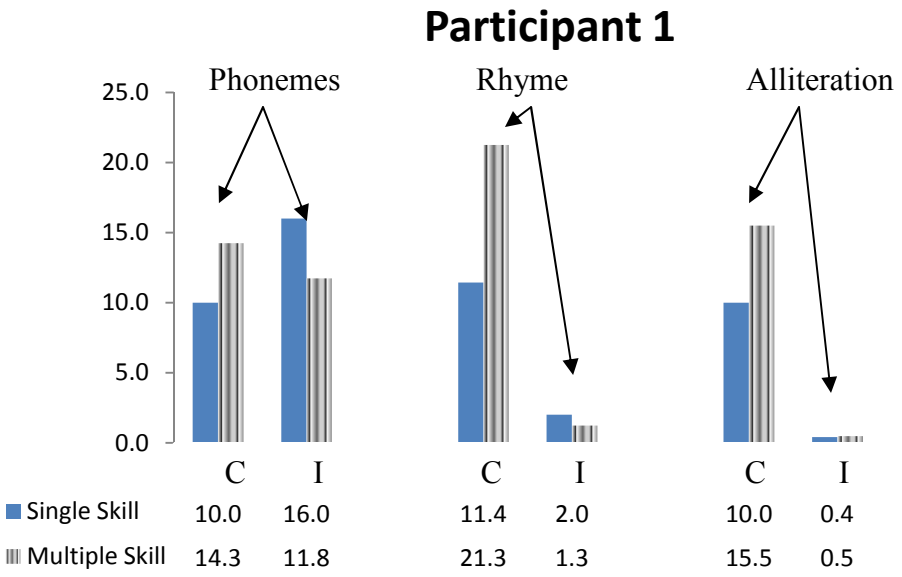


Figure 4.2. Participant 1's difference in responding between single and multiple skill instruction.

Participant 2

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 2 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 2 was unable to produce phonemes. Therefore her mean was zero with a range of zero.

Intervention. Intervention began for Participant 2 on the 5th session of the study after 4 sessions in baseline. Participant 2's mean score was 9.7 correct phonemes with a range of 1 to 20, across the 7 instructional sessions.

Baseline 2. Participant 2's score for the return to baseline for 18 sessions reflected a mean score of 6.7 correctly identified phonemes, the range was 0 to 11.

Discrimination Training. During 4 discrimination training sessions, Participant 2 scored a mean of 14.5 phonemes correctly produced, with a range of 14 to 15

Maintenance. Her mean during two maintenance sessions was 11.5 phonemes identified correctly with a range of 11 to 12.

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 2's performance on the Get it, Got it, Go (GGG), an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 2 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 2 received a UNS when she was unable to answer the 4 card sample (see Table 4.3 for summarized data). Participant 2 received a numeric score representing her performance in terms of correct and incorrect responses when she passed the sample card and began test administration.

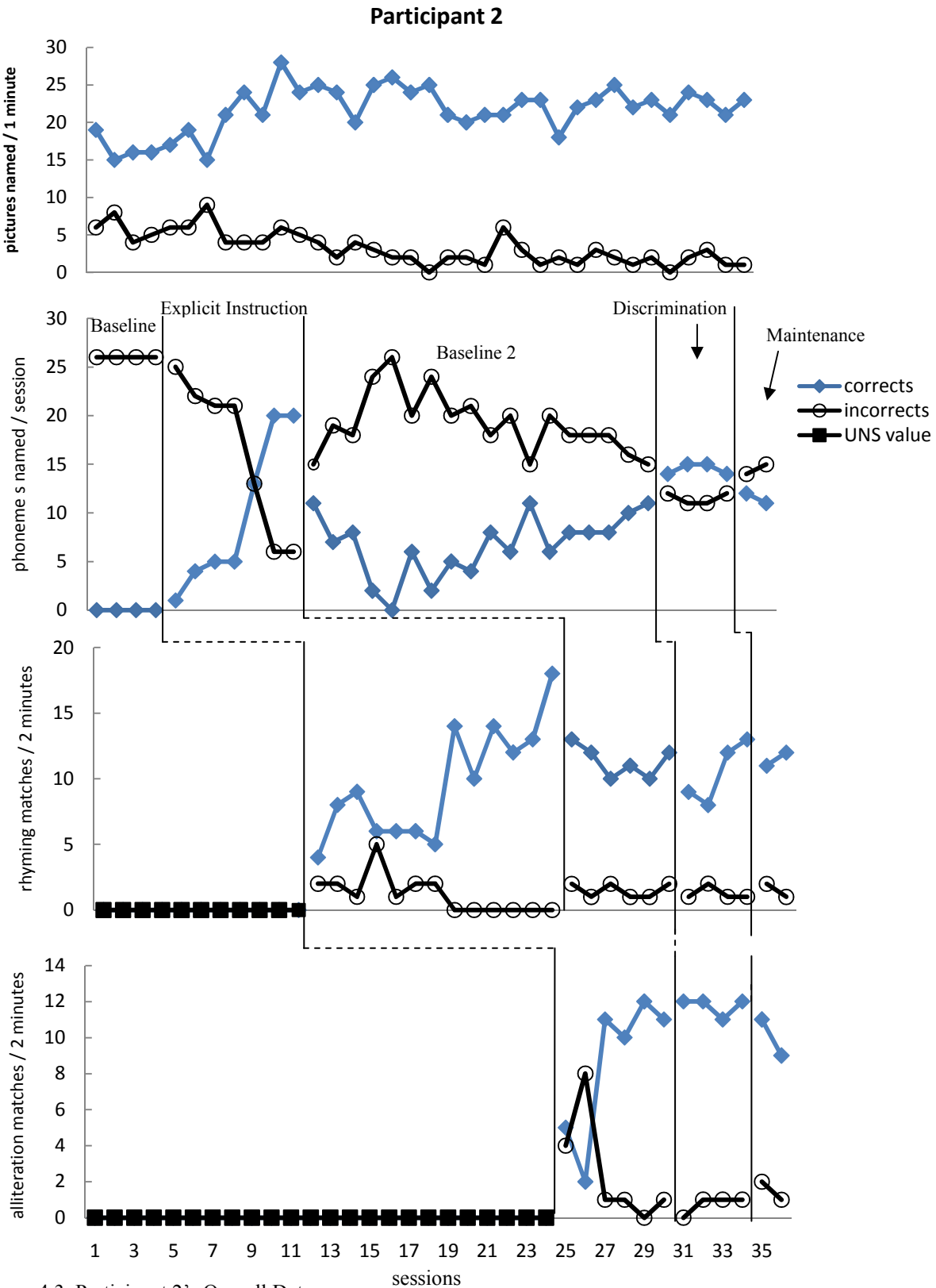


Figure 4.3. Participant 2's Overall Data

Note: UNS – did not pass sample assessment

Baseline. Participant 2, was tested across 11 sessions prior to explicit instruction and no evidence of rhyming ability was detected by the assessment tool. Her score for this phase was a UNS (see Figure 4.3).

Intervention. After the beginning of explicit instruction in rhyme, Participant 2 was able to secure a mean score of 9.6 correct responses, with a range of 4 to 18, and an average of 1.2 incorrect responses (range 0 to 5). Intervention lasted for 13 sessions.

Post-intervention, Participant 2 did not receive instruction for 6 sessions, but her mean score increased to 11.3 responses (range 10 to 13) and there was also an increase in mean incorrect responding to an average of 1.5 with a range of 1 to 2.

When discrimination training was in effect for 4 sessions, Participant 2's mean decreased to 10.3 correct responses with a range of 8 to 13. Her mean score of 1.3 incorrectly paired matches had a range of 1 to 2. Her mean score during 2 maintenance sessions was 11.5 correct responses (range 11 to 12) and a rate of 1.5 incorrect responses with a range of 1 to 2.

Alliteration Explicit Instruction

Alliteration skill was measured through Participant 2's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 2 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 2 received a UNS when she was unable to answer the 4 card sample (see Figure (graph). Participant 2 received a numeric score representing her

performance in terms of correct and incorrect responses when she passed the sample card pretest and began test administration.

Baseline. Participant 2 was tested across 24 sessions prior to explicit instruction and no evidence of the ability to alliterate was detected by the assessment tool. Her score for this phase was unable to sample (see Figure 4.3).

Intervention. Following 24 sessions of participation in the study, Participant 2 began explicit instruction in alliteration. Across the next 6 sessions, an observed mean score of 8.5 correct responses, with a range of 2 to 12, and 2.5 incorrect alliteration matches (range 0 to 8) occurred.

Discrimination Training. The explicit instruction condition was immediately followed by discrimination training and therefore there was no removal of instruction on alliteration (i.e., Baseline 2). Discrimination training yielded a mean score of 11.8 correct (range 11 to 12) and less than 1 (.75; range 0 to 1) incorrect matches across 4 sessions.

Maintenance. Two maintenance revealed a decreased mean score of 10 correct matches, with a range of 9 to 11. Her mean score for this phase was 1.5 average incorrect responses and her range was from 1 to 2.

Discrimination Training

Figure 4.4 represents the results of the component phonological awareness intervention on Participant 2's skill level in comparison with discrimination training. In terms of her ability to produce phonemes when presented with the vocal prompt, during the explicit instruction condition, Participant 2's mean score was 9.7 phonemes correctly produced per session with a range of 1 to 20. Participant 2's mean incorrect score was

16.3 and her range was 6 to 25. With the introduction of discrimination training, Participant 2's mean of correct responses increased to 14.5, with a range of 0 to 11, her incorrect productions fell to 11.5 (range 15 to 26). Participant 2 saw similar results with her ability to select rhyme matches after the discrimination training. Her skill level during explicit instruction was an average of 9.6 correct responses with a range of 4 to 18 and her mean score for incorrect responses was 1.2 (range of 1 to 2). Discrimination training provided a slight increase in a mean sore of 10.5 (range 8 to 13) and her incorrect responses were 1.3 with a range of 1 to 2. Participant 2's alliteration difference for correct responses was 3.1 with 8.5 correct responses being her average during explicit instruction with a range of 2 to 12 and 11.6 with a range of 11 to 12 being her mean score for discrimination training. Her incorrect responding for explicit instruction was 2.5 (range 0 to 8) and discrimination training brought an average score of .75 (range 0-1).

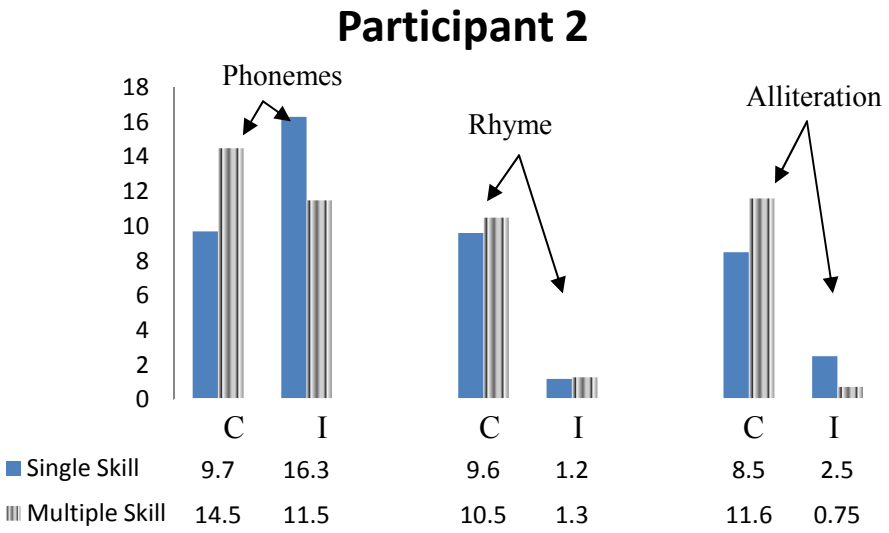


Figure 4.4. Participant 2's difference in responding between single and multiple skill instruction.

Participant 3

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 3 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 3 was unable to produce phonemes. Therefore her mean was zero with a range of zero.

Intervention. Following a baseline condition of 3 sessions, intervention began for Participant 3 on the 4th session of the study. Instruction on phoneme production lasted for 7 sessions. Participant 3's mean score was 10 correct phonemes, with a range of 1 to 20, out of 26 phonemes for those sessions.

Baseline 2. Participant 3's score for the return to baseline reflected a mean score of 10.8 correctly identified phonemes, and her range was 6 to 15, over 15 sessions.

Discrimination Training. Participant 3 scored a mean of 19.75 phonemes correctly produced, with a range of 25 to 24, during 4 discrimination training sessions.

Maintenance. Her mean increased to 23 phonemes identified correctly (range 23) during two maintenance sessions held at the conclusion of the study.

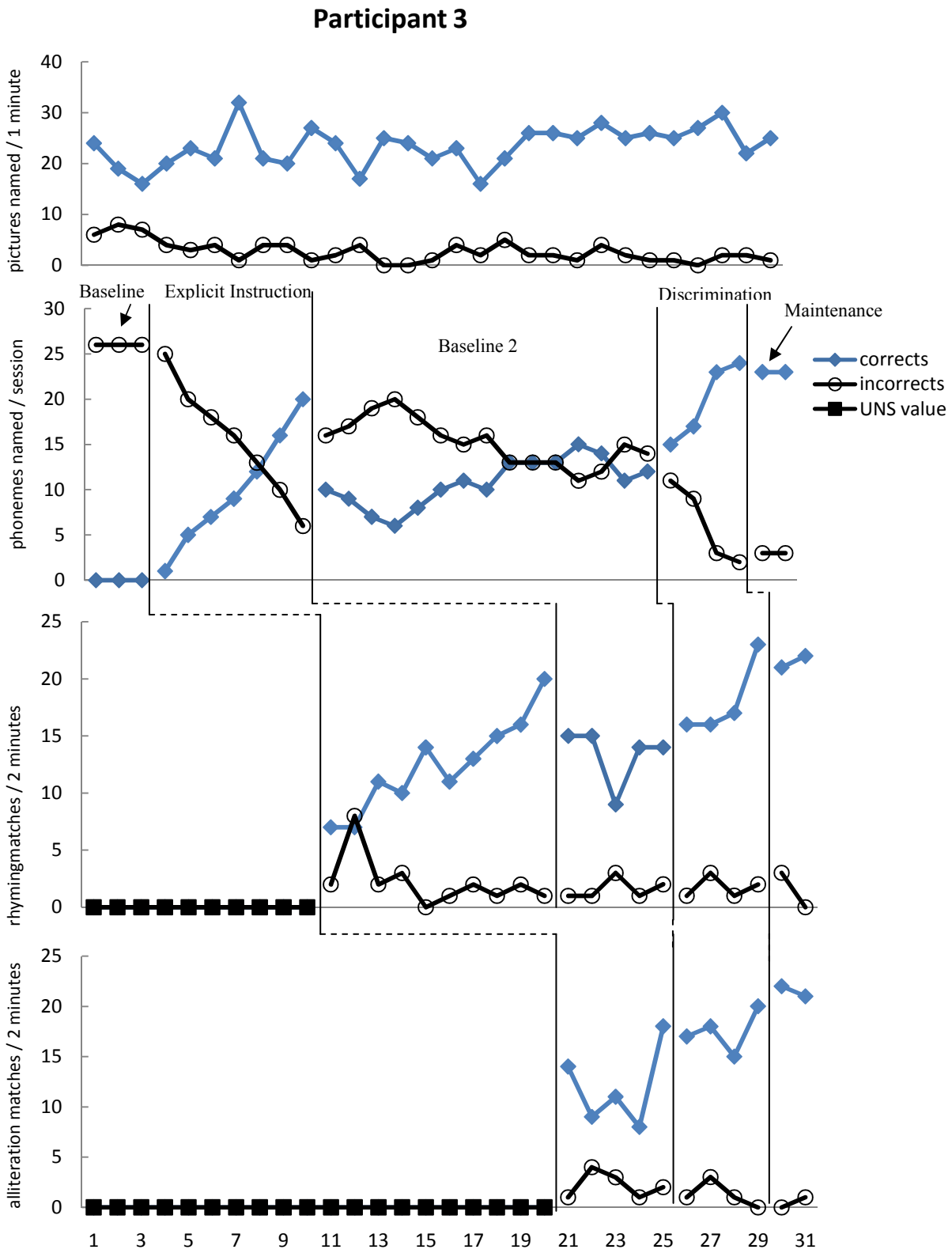


Figure 4.5. Participant 3's Overall Data

Note: UNS – did not pass sample assessment

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 3's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 3 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 3 received a UNS if they were unable to answer the 4 card sample (see Figure 4.5). She received a numeric score representing her performance in terms of correct and incorrect responses if they passed the sample card and began test administration.

Baseline. Participant 3 was tested for 10 sessions prior to explicit instruction and no evidence of rhyming ability was detected by the assessment tool. Her score was an unable to sample (UNS) for all sessions (see Figure 4.5)

Intervention. Participant 3 was able to increase her mean score to 11.4 correct responses with a range of 7 to 20 and an average of 2 incorrect responses (range 0 to 8) after beginning explicit rhyming instruction. Intervention lasted for 9 sessions.

Baseline 2. Post-intervention, Participant 3 did not receive instruction for 5 sessions and her responding decreased to an average of 7.4 correctly identified matches with a range of 8 to 19 and 2.6 incorrect responses (range 1 to 3).

Discrimination Training. When discrimination training was in effect for 4 sessions, Participant 3's mean increased to 21.3 correct responses (range 16 to 23) and 1.3 incorrectly paired matches with a range of 1 to 3.

Maintenance. Across 2 maintenance session, Participant 3's responding was 21.5 correct matches and her range was 21 to 22. Her incorrect responding was 1.5 with a range of 0 to 3.

Alliteration Explicit Instruction

Alliteration skill was measured through Participant 3's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 3 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 3 received a UNS if she was unable to answer the 4 card sample (see Figure 4.5). She received a numeric score representing her performance in terms of correct and incorrect responses when she passed the sample card and began test administration.

Baseline. Participant 3 was tested across 20 sessions prior to explicit instruction and no evidence of the ability to alliterate was detected by the assessment tool. Participant 3 received an unable to sample (UNS) score for this phase.

Intervention. Explicit instruction began with Participant 3 21 sessions after the beginning of the study. Across the next 5 sessions, Participant 3's scores averaged 12 correct alliteration matches, with a range of 8 to 18, and she incorrectly identified matches 2.2 times per session (range 1 to 4).

Discrimination Training. The explicit instruction condition was immediately followed by discrimination training and therefore there was no removal of instruction on alliteration (i.e., Baseline 2). Discrimination training added a little over 5 more matches

to her mean score, with 17.5 average correct matches (range 15-20) and 1.25 incorrect matches (range 0-3) for this phase.

Maintenance. Maintenance revealed 21.5 correct alliteration matches, with a range from 21-22, across 2 sessions and less than 1 (.5; range 1-2) incorrect responses observed during the assessment period.

Discrimination Training

Figure 4.6 shows the results of the component phonological awareness intervention on Participant 3's skill level in comparison with the discrimination training. In terms of her ability to produce phonemes when presented with the vocal prompt, during the explicit instruction condition, Participant 3's mean score was 10 phonemes correctly produced per session with a range of 1 to 20. Participant 3's mean incorrect score was 15.4 (range 6 to 25). With the introduction of discrimination training, Participant 3's mean of correct responses increased to 19.8, with a range of 15 to 24, and her incorrect productions fell to 6.3 (range 2 to 11). Participant 3 saw similar results with her ability to select rhyme matches after the discrimination training. Her skill level during explicit instruction was an average of 12.4 correct responses, with a range from 7 to 20, and the increase of an 18.3 mean score, with a range of 16 to 23, of correct responses during discrimination training was observed. Incorrect responses only saw a small decrease from explicit instruction to discrimination with mean scores of 2.2 (range 0 to 8) and 1.8 (range 1-3) respectively. Participant 3's alliteration difference for correct responses was 5.5 with 12 correct responses, with a range of 8 to 18, being her average during explicit instruction and 17.5 being her mean score, with a range of 15-20, for

discrimination. Participant 3's incorrect responding for explicit instruction was 2.2 times per session (range 1 to 4) and 1.25 incorrect matches (range 0-3) for discrimination training.

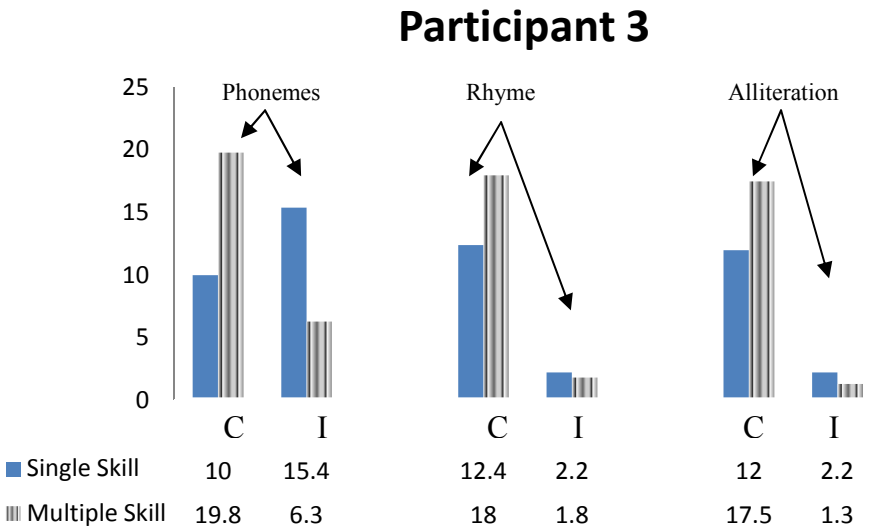


Figure 4.6. Participant 3's difference in responding between single and multiple skill instruction.

Participant 4

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 4 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 4 was unable to produce phonemes. Therefore his mean was zero with a range of zero.

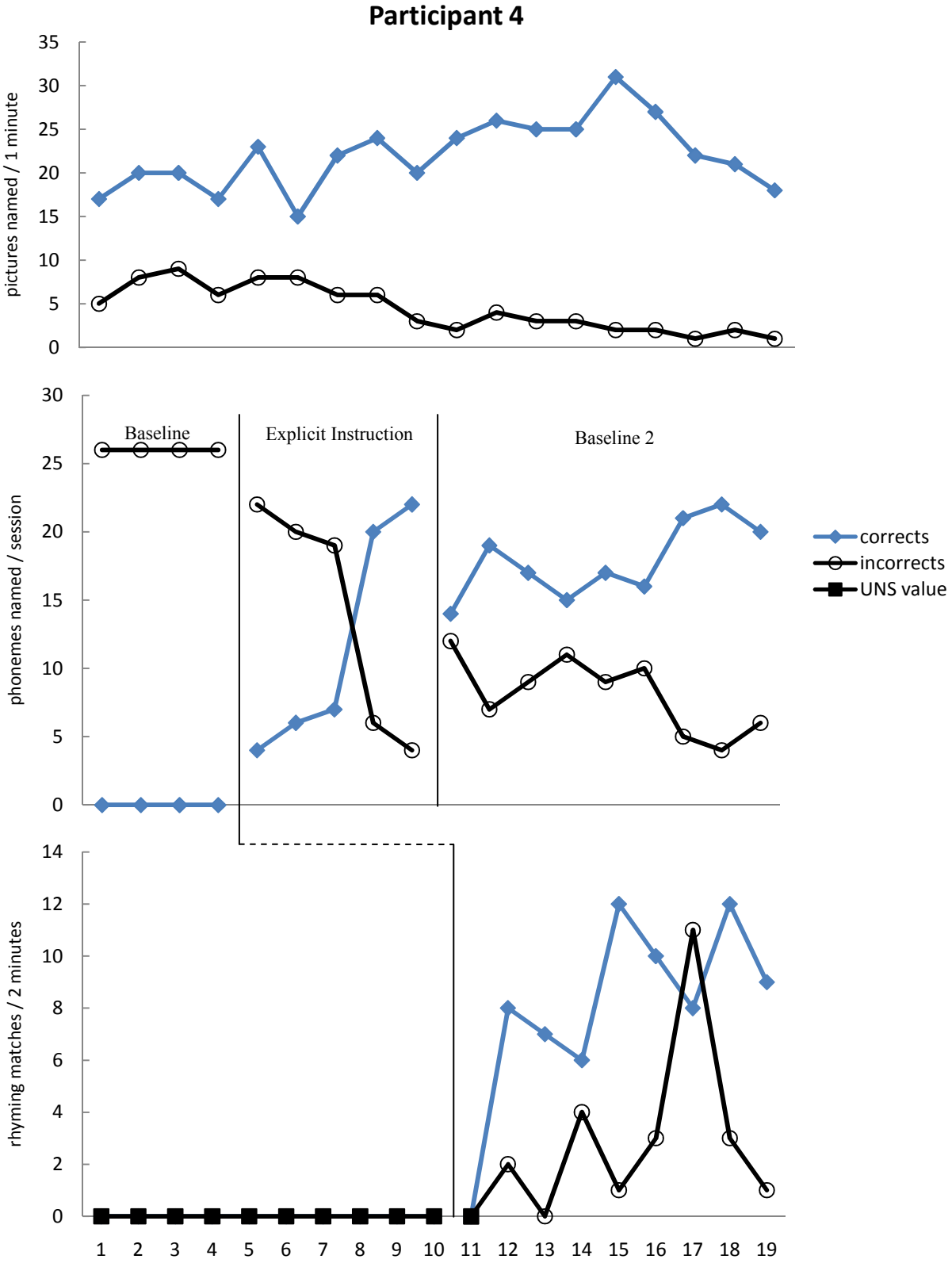


Figure 4.7. Participant 4's Overall Data

Note: UNS – did not pass pretest

Intervention. Following a baseline condition of 4 sessions, intervention began for Participant 4 on the 5th session of the study (see Figure 4.7). Instruction on phoneme production lasted for 5 sessions. Participant 4's mean score was 11.8 correct phonemes, with a range of 4 to 22, out of 26 phonemes.

Baseline 2. Participant 4's score for the return to baseline reflected a mean score of 17.9 correctly identified phonemes (range 14 to 22) over 9 sessions. Participant 4 was unavailable for discrimation training as well as maintenance checks at the conclusion of the study.

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 4's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 4 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 4 received a UNS if they were unable to answer the 4 card sample (see Figure 4.7). Participant 4 received a numeric score representing their performance in terms of correct and incorrect responses if they passed the sample card and began test administration. *Baseline.* Participant 4 was tested across 10 sessions respectively prior to explicit instruction and no evidence of rhyming ability was detected by the assessment tool. He received a score of an unable to sample (UNS) (see Figure 4.7)

Intervention. After the beginning of explicit instruction in rhyme, Participant 4 was able to increase his mean score to 9 correct responses, with a range of UNS to 12,

and an average of 3.1 incorrect responses (range 0-11) across 9 sessions. Participant 4 was no longer a participant into this study due to an abrupt disenrollment from school initiated by the parent.

Participant 5

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 5 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 5 was unable to produce phonemes. Therefore her mean was zero with a range of zero.

Intervention. Intervention began for Participant 5 on the 5th session of the study after 4 baseline sessions (see Figure 4.8). Instruction on phoneme production lasted for 6 sessions and Participant 5's mean score was 13.5 correct phonemes, with a range from 6 to 21, out of 26 phonemes.

Baseline 2. Participant 5's score for the return to baseline reflected a mean score of 14.2 correctly identified phonemes, her range was 8 to 19, over 19 sessions.

Discrimination Training. During 4 discrimination training sessions, Participant 5 scored a mean of 18.8 phonemes (range 16 to 24) correctly produced.

Maintenance. Participant 5's mean increased to 24.5 phonemes (range 24 to 25) identified correctly during two maintenance sessions held at the conclusion of the study.

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 5's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 5 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 5 received a UNS if she was unable to answer the 4 card sample (see Figure 4.8). Participant 5 received a numeric score representing her performance in terms of correct and incorrect responses she passed the sample card pretest and began test administration.

Baseline. In 10 sessions, Participant 5 had an average of 8.8 correct rhyming pairs (range 6 to 12) and 2.3 incorrect pairs (range 0-9) prior to the start of instruction.

Intervention. After the beginning of explicit instruction in rhyme, Participant 5 was able to increase her mean score to 18.9 correct responses, with a range of 10 to 27, and an average of less than 1 (.18; range 0-1) incorrect rhyming matches during this phase. Intervention lasted for 11 sessions.

Baseline 2. After intervention, Participant 5 did not receive instruction for 5 sessions and her responding decreased to an average of 10.3 correctly identified matches with a range of 8 to 12) and no incorrect responses (range zero).

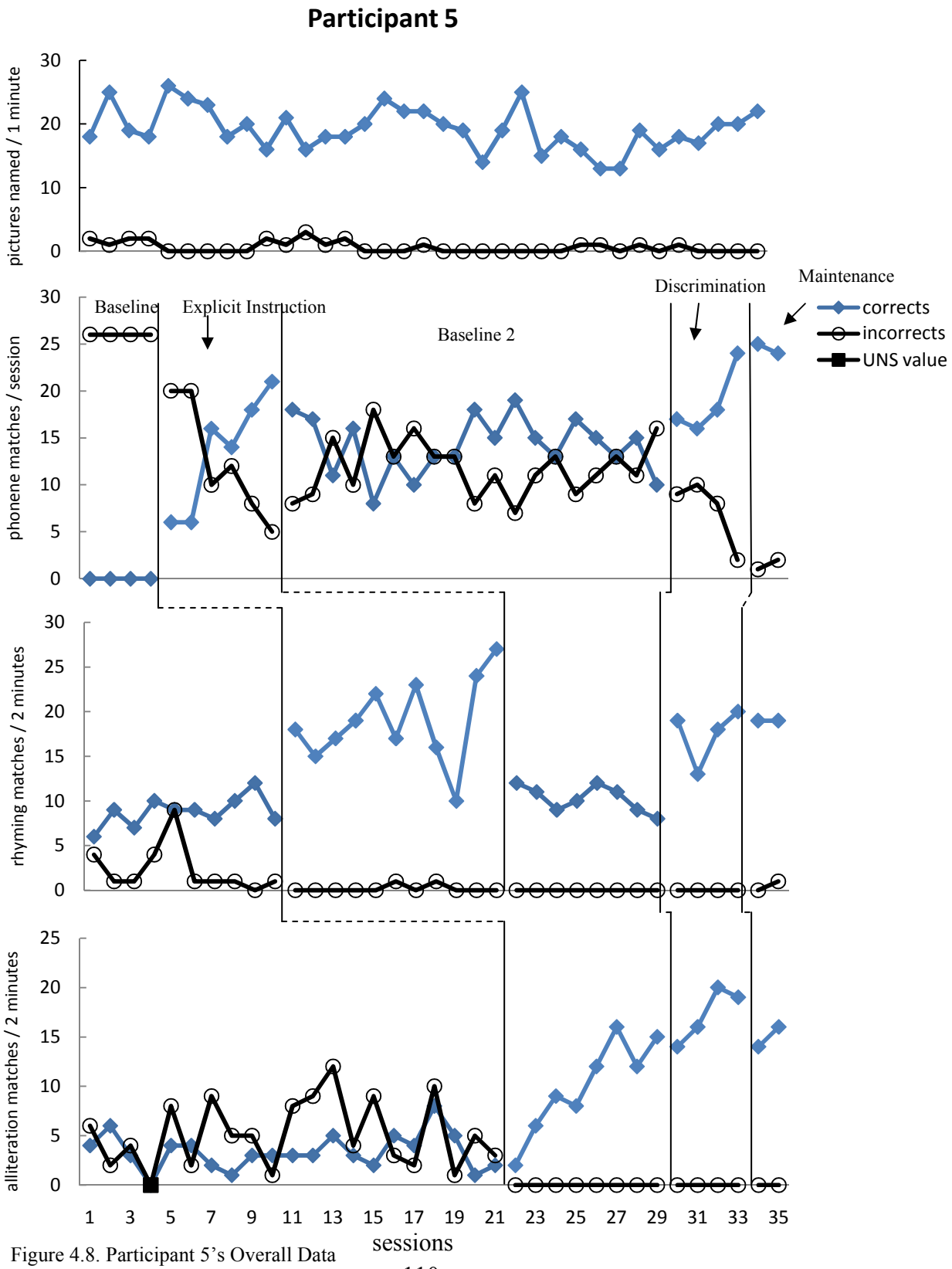


Figure 4.8. Participant 5's Overall Data

Note: UNS- did not pass sample assessment

Discrimination Training. When discrimination training was in effect for 4 sessions, Participant 5's mean increased to 17.5 correct responses and her range was from 13 to 20, and no incorrectly paired matches (range zero).

Maintenance. She maintained this responding with an increase to 19 correct responses with a range of 19, and a rate of .5 incorrect responses (range 0 to 1).

Alliteration Explicit Instruction

Alliteration skill was measured through Participant 5's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 5 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 5 received a numeric score representing her performance in terms of correct and incorrect responses after she passed the sample card pretest and began test administration.

Baseline. Participant 5 evidenced 3.6 correct alliteration matches with a range of 0 to 8, across 21 sessions and a mean score of 5.4 for incorrect responses, with a range from 0 to 9, prior to the introduction of explicit instruction (see Figure 4.8).

Explicit Instruction. On the 22nd session of the study, Participant 5 began explicit instruction in alliteration. Across the next 8 sessions, Participant 5 almost increased her mean score from baseline with an average score of 10 correct responses with a range from 2 to 16 and no incorrect responses across those sessions (range zero).

Discrimination Training. The explicit instruction condition was immediately followed by discrimination training and therefore there was no removal of instruction on

alliteration (i.e., Baseline 2). Discrimination training added a little over 7 more matches to her mean score, with 17.3 average correct matches (range 14 to 20) and she maintained having no incorrect responses (range zero).

Maintenance. Two maintenance sessions revealed 15 correct alliteration matches, with a range of 14 to 16, and no incorrect responses (range zero) observed during the assessment periods.

Discrimination Training

Figure 4.9 shows the results of the component phonological awareness intervention on Participant 5's skill level in comparison with the discrimination training. In terms of her ability to produce phonemes when presented with the vocal prompt, during the explicit instruction condition, Participant 5's mean score was 13.5 phonemes correctly produced per session and her range was from 6 to 21. Participant 5's mean incorrect score was 12.5 with a range of 5 to 20. With the introduction of discrimination training, Participant 5's mean of correct responses increased to 18.8 with a range of 16 to 24 and her incorrect productions fell to 7.3 (range 2 to 10). Participant 5 saw similar results with her ability to select rhyme matches after the discrimination training. Her skill level during explicit instruction was an average of 18.9 correct responses with a range from 10 to 27, and that mean score fell .6 with an average of 17.5 correct responses (range 13 to 20) for discrimination training. Incorrect responses remained at less than 1 incorrect across both phases and Participant 5 only saw a small decrease from explicit instruction to discrimination with mean scores of .2 (range 0 to 1) and 0 (range 0) respectively. Participant 5's alliteration difference for correct responses was 7.3 with 10

correct responses with a range of 2 to 16, being her average during explicit instruction and 17.3 (range 14-20) being her mean score for discrimination training. Participant 5's incorrects were 0 across both phases (range of zero for both).

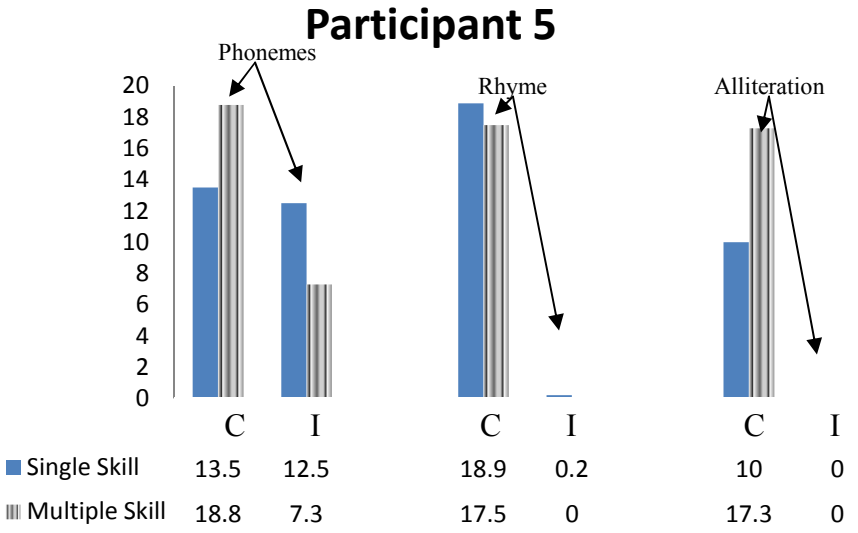


Figure 4.9. Participant 5's differences in responding between single multiple skill instruction.

Participant 6

Phonemic Awareness Explicit Instruction

The scores for this section show the number of correct answers out of 26 opportunities that Participant 6 scored per session. The mean scores obtained prior to instruction are described first followed by the scores obtained during intervention.

Baseline. Prior to the beginning of the intervention phase of the study, Participant 6 was unable to produce phonemes. Therefore his mean was zero with a range of zero.

Intervention. Following a baseline condition of 4 sessions, intervention began for Participant 6 on the 5th session of the study (see Figure 4.10). Instruction on phoneme

production lasted for 6 sessions. Participant 6's mean score was 8.8 correct phonemes, with a range from 1 to 17, out of 26 phonemes.

Baseline 2. Participant 6's score for the return to baseline reflected a mean score of 10.8 correctly identified phonemes and his range was 7 to 16 over 13 sessions.

Discrimination Training. During 4 discrimination training sessions, Participant 6 scored a mean of 16.5 phonemes correctly and his range was from 14 to 19.

Maintenance. Maintenance lasted for two sessions. Participant 6's mean score for correct productions was 12.5 (range 12-13).

Rhyming Explicit Instruction

Rhyming skill was measured through Participant 6's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 6 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 6 received a UNS when he was unable to answer the 4 card sample (see Figure 4.10). Participant 6 received a numeric score representing his performance in terms of correct and incorrect responses when he passed the sample card pretest and began test administration.

Baseline. Participant 6 was tested across 10 prior to explicit instruction and no evidence of rhyming ability was detected by the assessment tool. He received a score of unable to sample (UNS) for each session in this phase.

Intervention. Participant 6 was unable to show evidence of the ability to select correct rhyming matches during the 7 sessions where rhyming instruction was assessed.

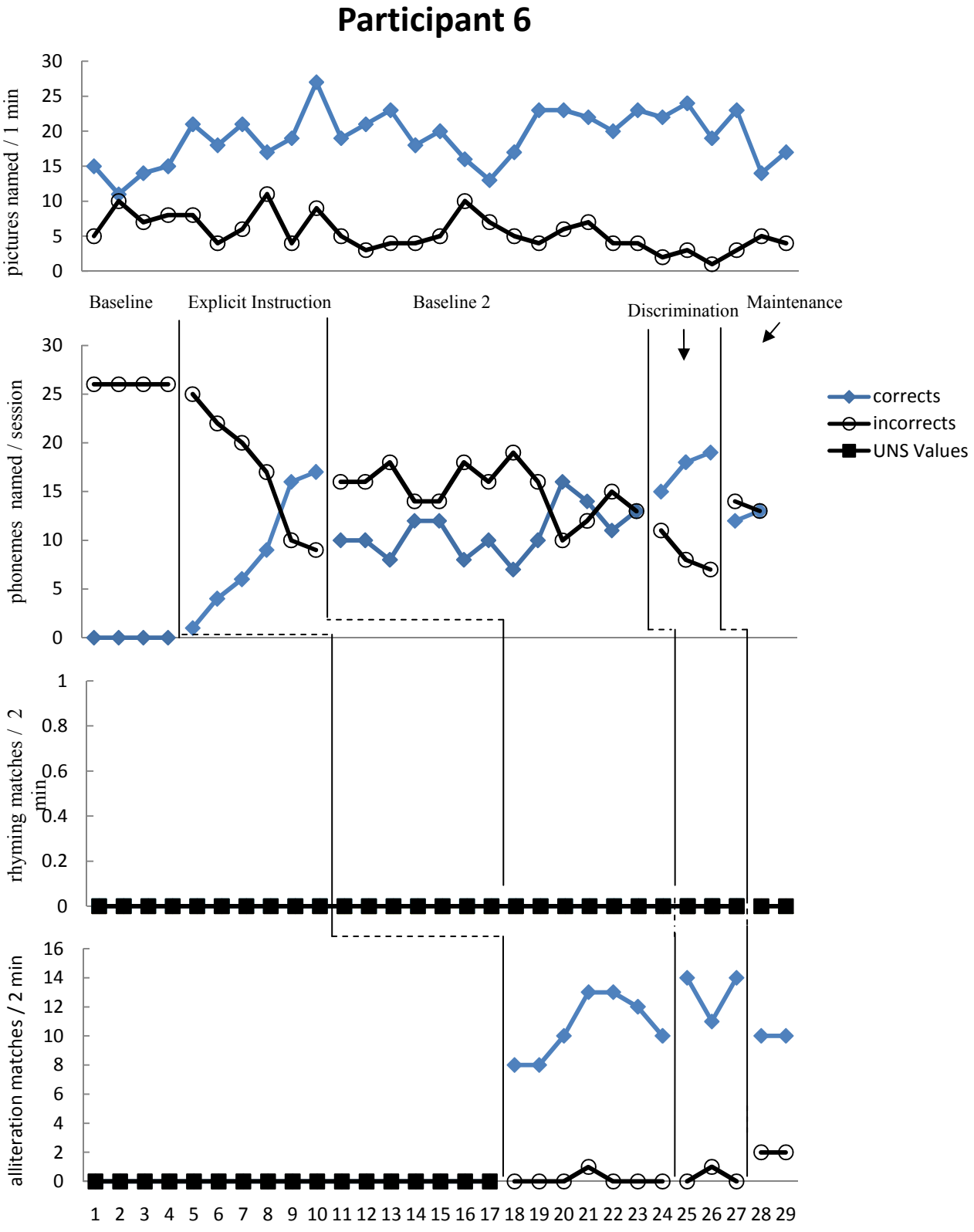


Figure 4.10. Participant 6's Overall Data

Note: UNS – did not pass sample assessment

These 7 sessions represent approximately 3 weeks of explicit instruction. Assessment of rhyming skills continued throughout the remainder of the study and there was no emergence of the skill.

Maintenance. Maintenance of the skill was tested approximately 6 weeks after the conclusion of the study for Participant 6. Evidence of the skill was unable to be detected at this time.

Alliteration Explicit Instruction

Alliteration skill was measured through Participant 6's performance on the Get it, Got it, Go (GGG) an individual growth and development indicator (IGDI). This assessment was used for all sessions and across all conditions. Participant 6 was given a 2 card teacher model and 4 card sample assessment before being able to access the full test administration. Participant 6 received a UNS when he was unable to answer the 4 card sample pretest (see Figure 4.10). Participant 6 received a numeric score representing his performance in terms of correct and incorrect responses when passed the sample card pretest and began test administration.

Baseline. Participant 6 was tested across 17 sessions prior to explicit instruction and no evidence of the ability to alliterate was detected by the assessment tool. Participant 6 received a score of unable to sample (UNS) for each session in this phase.

Intervention. Participant 6 began explicit instruction in alliteration after 17 sessions of participation in the study. Across the next 7 sessions, Participant 6's mean score was 10.8 correct responses with a range of 8 to 13 and less than 1 (.14; range 0-1) incorrect responses.

Discrimination Training. The explicit instruction condition was immediately followed by discrimination training and therefore there was no removal of instruction on alliteration. Discrimination training revealed a mean score of 13 correct responses with a range from 11 to 14 and .33 incorrect responses (range 0 to 1).

Maintenance. Maintenance sessions for Participant 6 occurred approximately 6 ½ weeks after the conclusion of the study. After the conclusion of discrimination training, Participant 6 travelled to visit family in the Dominican Republic. It was reported by the parent that Spanish was the main language spoken during his stay. Also, there was no report of any literacy activities, including reading or language support, during his stay. Upon his return, Participant 6's mean score for correct alliteration matches was 10 with a range of 10. His mean incorrect score for these two sessions was 2 with a range of 2.

Discrimination Training

Figure 4.11 shows the results of the component phonological awareness intervention on Participant 6's skill level in comparison with the discrimination training. In terms of his ability to produce phonemes when presented with the vocal prompt, during the explicit instruction condition, Participant 6's mean score was 8.8 phonemes, with a range of 1 to 17, correctly produced per session. Participant 6's mean incorrect score was 17.2 and his range was from 9 to 25. With the introduction of discrimination training, Participant 6's mean of correct responses increased to 16.5 (range14 to 19) and his incorrect productions fell to 9.5 and his range was from 7 to 12. Participant 6 was unable to move beyond the sample assessment during rhyming trials and therefore didn't receive a score. Participant 6's alliteration difference for correct responses was 2.4 with

10.6 correct responses (range 8 to 13) being his average during explicit instruction and 13 (range 11 to 14) being his mean score during discrimination training. His incorrect responding saw a difference of .2 as a mean as Participant 6 received less than 1 as an average score for incorrects during both explicit instruction (.14; range 0-1) and discrimination training (.33; range 0 to 1).

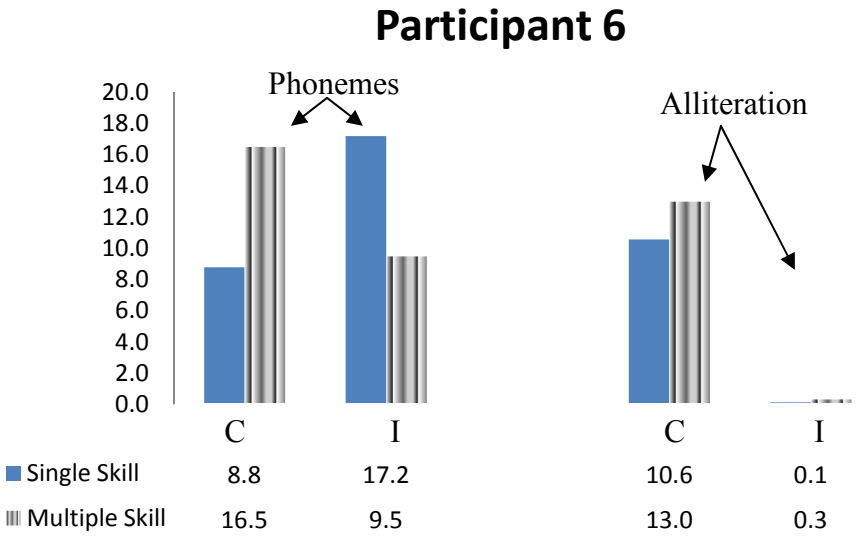


Figure 4.11. Participant 6's differences in responding during single and multiple skill instruction.

Computerized Format of IGDI

Rhyme awareness and alliteration skills in this study were probed using the computerized format of the Get It, Got it, Go. The rhyming test was probed for 18 percent of total sessions and the alliteration test was probed for 19 percent of sessions.

Interobserver Agreement

Agreement was obtained via two methods in this study was obtained by the researcher only for approximately 50% of the sessions and by the researcher and second

observer for the remaining sessions. Agreement was 99.8 % with a range of 94-100% for the rhyming test. The alliteration test agreement was 98 % with a range of 67-100%. The above scores represent the mean responding of participants separated by format (computer-based vs. traditional/flash card). On average, the mean scores of both assessment formats were similar as well as the associated ranges of responding.

Participant Rhyming Scores-Computer Format

Participant	**Baseline** Mean (range) # sessions		**Intervention** Mean (range) # sessions		**Baseline 2** Mean (range) # sessions		**Discrimination** Mean (range) # sessions		**Maintenance** Mean (range) # sessions	
Rhyming										
	C	I	C	I	C	I	C	1	C	I
Participant 1	5.3 (3,7) # 4	6.5 (3,13)	9.5 (9,10) #2	2 (2)	7.5 (7,8) #2	2.5 (2,3)	n/d #0	n/d	n/d #0	n/d
Participant 2	0 (0) #2	0 (0)	10.8 (8,14) #4	.8 (0,2)	10.5 (10,11) #2	1.5 (1,2)	8 (8) #1	2 (2)	n/d	n/d
Participant 3	0 (0) #3	0 (0)	14 (13,15) #2	1.5 (1,2)	n/d	n/d	n/d	n/d	n/d	n/d
Participant 4	0 (0) #2	0 (0)	7 (7) #1	0 (0)	n/d	n/d	n/d	n/d	n/d	n/d
Participant 5	9.7 (8, 12) #3	3.3 (0,9)	14.7 (10,18) #3	.3 (0)	10 (8,12) #4	0 (0)	n/d	n/d	19 (19) #1	0 (0)
Participant 6	Unable to be sampled									

Table 4.2. Mean Rhyming Computer-based Format scores.
Notes: C=Correct responses, I=Incorrect responses, n/d = no comparison data available

Participant Alliteration Scores-Computer Format

Participant	**Baseline** Mean (range) # sessions		**Intervention** Mean (range) # sessions		**Discrimination** Mean (range) # sessions		**Maintenance** Mean (range) # sessions	
	C	I	C	I	C	1	C	I
Participant 1	4.3 (1,6) # 7	4.4 (1,9)	9 (9,10) #2	1 (1)	n/d	n/d	n/d	n/d
Participant 2	0 (0) #2	0 (0)	10.8 (8,14) #4	.8 (0,2)	8 (8) #1	2 (2)	n/d	n/d
Participant 3	0 (0) #6	0 (0)	16.5 (15,18) #2	2 (1,3)	n/d	n/d	n/d	n/d
Participant 5	4 (2,8) #6	8 (5,10)	13.5 (12,15) #2	0 (0)	n/d	n/d	n/d	n/d
Participant 6	0 (0) #2	0 (0)	11.5 (10,13) #2	.5 (0,1)	14 (14) #1	0 (0)	n/d	n/d

Table 4.3 Mean Alliteration Computer-based Format scores.
Notes: C=Correct Responses, I=Incorrect Responses, n/d= no comparison data available

Participant Rhyming Scores-Traditional Format

Participant	**Baseline** Mean (range) # sessions		**Intervention** Mean (range) # sessions		**Baseline 2** Mean (range) # sessions		**Discrimination** Mean (range) # sessions		**Maintenance** Mean (range) # sessions	
Rhyming										
	C	I	C	I	C	I	C	1	C	I
Participant 1	4.3 (3,6) # 4	3.8 (2,4)	12 (8,18) #7	2 (0,3)	7.3 (6,9) #3	2.6 (1,4)	n/d	n/d	n/d	n/d
Participant 2	0 (0) #2	0 (0)	9.1 (4,18) #9	1.3 (0,5)	11.8 (10,13) #4	1.5 (1,2)	11.3 (9,13) #1	1 (1)	n/d	n/d
Participant 3	0 (0) #7	0 (0)	12 (7,20) #8	2.4 (0,8)	n/d	n/d	n/d	n/d	n/d	n/d
Participant 4	0 (0) #8	0 (0)	8.1 (6,12) #8	3.1 (0,11)	n/d	n/d	n/d	n/d	n/d	n/d
Participant 5	8.4 (6,10) #7	1.9 (1,4)	20.5 (15,27) #8	.1 (0,1)	10.5 (9,12) #4	0 (0)	n/d	n/d	19 (19) #1	1 (1)
Participant 6	Unable to be sampled									

Table 4.4. Mean Rhyming Traditional Format scores.
Notes: C=Correct responses, I=Incorrect responses, n/d = no comparison data available

Participant Alliteration Scores-Traditional Format

Participant	**Baseline** Mean (range) # sessions		**Intervention** Mean (range) # sessions		**Discrimination** Mean (range) # sessions		**Maintenance** Mean (range) # sessions	
	C	I	C	I	C	1	C	I
Participant 1	3.1 (0,7) # 8	2.6 (0,6)	10.6 (8,11) #3	0 (0)	n/d	n/d	n/d	n/d
Participant 2	0 (0) #19	0 (0)	7.5 (2,12) #4	3.3 (0,8)	11.7 (11,12) #3	.7 (0,1)	n/d	n/d
Participant 3	0 (0) #15	0 (0)	18.5 (7,20) #2	.5 (0,1)	n/d	n/d	n/d	n/d
Participant 5	3.2 (0,6) #14	4.3 (0,12)	8.8 (2,16) #6	0 (0)	n/d	n/d	n/d	n/d
Participant 6	0 (0) #15	0 (0)	10.2 (8,13) #5	0 (0)	n/d	n/d	n/d	n/d

Table 4.5. Mean Alliteration Traditional Format scores.
Notes: C=Correct responses, I=Incorrect responses, n/d = no comparison data available

Social Validity Results-Participants

Social validity questionnaires were distributed by a teacher in the school on the day after maintenance data were taken. The teacher pulled each participant from the classroom one at a time and explained that they were going to answer questions about the time they spent with the experimenter. The response card was presented to each participant and they and were told what each face meant (i.e., green/happy face means yes, red/sad face means no and yellow face with no expression means indifferent). Each participant was asked to repeat the meanings of each face. They were also told that they did not have to answer each question. The teacher then asked each question, recording the response by that question for each participant. Each participant number is located by the questions number (see Table 4.2). All denotes that every participant responded with that answer.

Individual Participant Responses

Participant 1. Participant 1 responded "yes" to questions 1,2,3,4,5,6,and 7. He answered "yes" for if he felt like he knew how to make letter sounds. He also responded "yes" for if he felt like he knew how to rhyme, alliterate and working with the experimenter and friends and if he felt that the skills learned (phonemic awareness, rhyming and alliteration) were important. He picked the face that related to "indifferent" for the question that asked about graphing. Nothing was mentioned in response to the question if Participant 1 had anything else to say.

Questions	Yes	No	Indifferent	N.R.
1.Do you feel like you know how to make letter sounds?	All			
2.Do you think that it's important to know letter sounds?	1,3,5			2
3.Do you feel like you know how to rhyme words?	All			
4.Do you think that it's important to know how to rhyme words?	1,3,5			2
5.Do you feel like you know how to alliterate?	All			
6.Do you think that it's important to know how to alliterate?	1,3,5			2
7.Did you like working with Ms. Temple and your friends and learning about all of these skills?	All			
8.Did you like graphing your work?	2,3,5		1	
Do you have anything else to say?	None	None	None	None

Table 4.2. Social Validity Responding

Participant 2. Participant 2 responded "yes" to questions 1,3,5,7,8. She answered "yes" for if she felt like she knew how to make letter sounds. She also responded "yes" for if her felt like her knew how to rhyme, alliterate and working with the experimenter and friends and graphing her work. She chose the face that corresponded to "indifferent" for questions 2,3,6. These questions related to whether she felt as if the skills she learned (phonemic awareness, rhyming and alliteration) were important. The teacher commented on her form that she provided the alternative words for "important" and Participant 2 still did not understand the question. Nothing was mentioned in response to the question if Participant 2 had anything else to say.

Participant 3. Participant 3 responded "yes" to questions 1,2,3,4,5,6,7, and 8. She answered "yes" for if she felt like she knew how to make letter sounds. She also responded "yes" for if she felt like she knew how to rhyme, alliterate and working with the experimenter and friends as well as if she felt that the skills learned (phonemic awareness, rhyming and alliteration) were important. Nothing was mentioned in response to the question if Participant 3 had anything else to say.

Participant 5. Participant 5 responded "yes" to questions 1,2,3,4,5,6,7, and 8. She answered "yes" for if she felt like she knew how to make letter sounds. She also responded "yes" for if she felt like she knew how to rhyme, alliterate and working with the experimenter and friends as well as if she felt that the skills learned (phonemic awareness, rhyming and alliteration) were important. Nothing was mentioned in response to the question if Participant 5 had anything else to say.

Social Validity Results- Classroom Teachers

Social validity questionnaires were distributed by the experimenter approximately 1 month after the study was completed. The experimenter gave each teacher a questionnaire during their break period and asked them to return it in the sealed envelope to the second observer or later retrieval by the experimenter. The experimenter explained the questionnaire as a Lickert-type questionnaire and provided an example of what the question looked like. The sample question used was "Do you like chocolate?" and the answers were: strongly agree, somewhat agree, no opinion, somewhat disagree, and strongly disagree. The experimenter also stated that each question had its own unique set of responses therefore the classroom teachers should play close attention to the responses

provided for each question (i.e., the same Lickert-type scale was not used for each question). Each classroom teacher responses are located below by each question (see Table 4.3). Numerical values were assigned to each response as follows: Strongly Agree = 5; Somewhat Agree = 4; No Opinion = 3; Somewhat Disagree = 2; Strongly Disagree = 1. The response of no opinion was explained to the classroom teachers to represent a value where there was not a clear agreement or disagreement with the question presented. An overall score closer to 35 indicates that a more positive opinion of the study and a score closer to 7 indicates a more negative opinion of the study. The classroom teachers were also asked to provide additional comments regarding the study. In response to the question: Please state in your own words if you have seen any of the participants displaying any behavior that would correspond with an increase in phonological awareness skills. If you have not seen anything, please indicate that below as well.

Teacher 1 commented:

> Teacher 1= I noticed that the children enjoyed singing the letter-sound song and I would find them humming it as they played or during dramatic play. I even asked the experimenter for a copy of what she used so that I could teach the rest of the class. As far as rhyming, the participants also started to rhyme simple words in the classroom and if another participant said a rhyming pair, some participants would make comments like, "Hey, that rhymes." I did not see a lot of evidence of participants starting to alliterate, although some participants, especially [Participant 5] would talk about it being time to "alliterate" or time for "alliteration." All of the participants in the study loved doing the computer and would ask if they could do the computer game on the classroom computer.

Teacher 2 commented:

> Teacher 2= I would see during circle time that the participants in the study were more likely to say, "Hey that words starts like "[/b/]" or "cat rhymes with that word". I also saw that participants were singing the song in the classroom.

Individual Responses

	Questions	Teacher 1 Response	Teacher 2 Response
	In looking at the entire group, explicit instruction was seen to improve the phonological awareness (phonemic awareness, rhyming and alliteration awareness) of the participants.	4	4
	Explicit Instruction is something you could see yourself implementing in the classroom.	4	5
	Your participants seemed to enjoy participating in the study.	5	4
	The computer format of the GGG is something that you could see yourself using to assess all of your participants.	3	5
	Explicit instruction would be hard to implement.	2	2
	Phonemic Awareness, rhyme awareness and awareness of alliteration are important skills for participants to know prior to entrance into kindergarten.	4	5
	Teaching preschool participants using explicit instruction would be easy to implement.	4	4
Overall Score:		26	29

Table 4.3. Teacher questionnaire responses

CHAPTER 5

DISCUSSION

This study investigated the effects of explicit instruction on three of the component skills related to phonological awareness (phonemic awareness, rhyme awareness and awareness of alliteration). This study also investigated the data from a computerized version of an individual growth and development indicator (IGDI), the Get it, Got it, Go in comparison with the traditional flashcard assessment tool. The behavior of the treatment participants was compared to two participants, a typically developing peer (Participant 5) and a participant who first language is Spanish (Participant 6). This chapter provides (a) a discussion of the results of the seven research questions posed at the end of Chapter 1. This chapter also includes (b) the contributions of the study, (c) the limitations of the study as well as (d) the directions of future research. This chapter concludes with a summary of the study.

Research Question One

What are the effects of explicit language instruction on the phonemic awareness (i.e. phoneme identification) of participants?

Based on the visual analysis of the data as well as the mean scores, explicit instruction in phonemic awareness provided a definite increase in the ability of all participants to produce phonemes. The multiple baseline design allowed for a systematic

analysis of phoneme production across participants that demonstrated a functional relationship with explicit instruction. Prior to the implementation of instruction, none of the participants were able to produce phonemes after the experimenter presented a vocal prompt. Participants were in the baseline condition for approximately four sessions, only one, Participant 3, had three sessions in the first phase of this study. After implementation of the phonemic awareness instruction, all participants saw increases in their productions. The visual analysis of the graphs, seen in the second phase, shows a functional relationship between the ability of participants to produce phonemes and explicit instruction.

This study also employed an ABA design which was embedded in the multiple baseline design. Prior to the beginning of the study, a criteria was set that required participants to respond responding for two consecutive sessions above 15 correct phoneme productions before moving to the next phase of the study. All participants met the criteria and were moved to the next phase which was removal of instruction. This removal of instruction coincided with the introduction of explicit instruction in rhyme. This exchange occurred in order to maintain the integrity of this experimental design. Unfortunately when the participants were in Baseline 2 there was an increase in incorrect responses and a decrease in correct responding. Specifically, Participant 1 began to see attrition immediately following the removal of instruction. As it was noted in the results section, sickness also stretched this normal three week time span for the other participants (time spent in the second phase and moving into the third phase) into almost six weeks, two of which happened between phases. Participant 2 also saw attrition during the third

phase of the study, but after the 18th session of the study, she began to also see a gain in the number of phonemes she was able to name. This 18th session also saw a sharp increase in the number of rhyming matches she was making, which suggests that she started to become more sensitive to the language and sounds and how they interact with the words in her environment. This increase continued through the beginning of alliteration instruction. While phonemes were not explicitly taught during this phase, nor was it stressed in instruction (i.e., the first sound in ball is /b/, and the letter b makes the /b/ sound) it is possible that by isolating the first sound in a word, phoneme production would increase.

Participant 3 did not see the same level of decline with her correct productions of phonemes and averaged around 10 phonemes correct during explicit instruction and 10.8 phonemes correctly produced post intervention. Participant 3 also saw an increase in correct production during the course of her rhyme instruction. The session that alliteration instruction started, the 21st session, brought a crossover in Participant 3's phoneme production. Participant 3 was producing more phonemes correctly than incorrectly. Participant 4 also shared the same crossover during explicit instruction in phonemic awareness. This crossover maintained during the removal of instruction with a mean score of 17.9 phonemes correctly produced. This could indicate that mastery needs to be at a higher level (e.g., 3-4 consecutive days of accurate responding at 15 correct phonemes or an increase of the criteria to 20+ phonemes).

The comparison peers also saw a crossover of their rate of correct and incorrect responding during phonemic awareness instruction. Participant 6 and Participant 5 also

started the phase without any phoneme production that could be detected by the curriculum based measure. After introduction of the explicit instruction, Participant 5 and Participant 6 were able to meet the criteria needed to move into rhyme awareness explicit instruction. During the 3rd phase of the study, Participant 5 and Participant 6 were able to keep their average correct productions at 18.8 and 16.5 respectively. Alliteration training for Participant 6 brought an increase to his phoneme production where Participant 5 continued to see a lot of variability in her data.

Even with the loss of skill, a controlling relationship was seen in both the characteristics of the multiple baseline design as well as the embedded ABA design. The responses of participants changed when and only when the independent variable, in this case, explicit phoneme instruction, was present for participants. At the conclusion of the 2nd phase, participants saw a drop in their responding. None of them returned completely to baseline levels, which shows that retained some carryover of the skill into the return to baseline. This is expected with skills, such as academic skills, which cannot be unlearned (Cooper, Heron, Heward, 2007). Another concern would be the close return to baseline levels of Participant 1 which could be explained by his sickness during the training phase. After the discrimination training, which included explicit instruction in phonemic awareness, rhyming and alliteration, he was able to once again increase his accurate phoneme production. He maintained his level of phoneme production during the maintenance checks almost 3 weeks after the conclusion of the study.

Similar effects as those in this study are supported by a wide base of literature (Nichols, Rupley, Rickelman & Algozzine, 2004; Treiman, Pennington, Shriberg &

Boada, 2008). Nichols et al. (2004) explored the phonemic awareness levels of culturally diverse kindergarten participants and found that prior to intervention, they had no or low levels of phonemic awareness and concepts of print development. After intervention, instruction in the above skills as well as maturation increased the skill level of the participants. Nichols and colleagues point out that maturation is a key variable when looking at phonemic awareness and the ability level of young participants. Troia, Roth and Graham (1998) recommend that the developmental appropriateness of skills should be considered when looking at what should be explicitly taught to young children. Researchers have found that phonemic awareness is not sufficient alone, but should be paired with other skills, such as phonics (Hatcher, Goetz, & Snowling et al., 2006; Juel, 1988; Schneider, 1997; Yeh, 2003).

This data indicates that not only can participants learn phonemes through explicit instruction but, if effectively taught; preschool participants can maintain the skills. This is important because the National Reading Panel (2000) indicates that phonemic and phonological awareness are critical in the development of reading skills. Therefore, if preschoolers can be instructed in these important prereading skills they will be in better position to become successful readers upon entering kindergarten. On the other hand, researchers have found that children who enter kindergarten with lower prereading skills often fall behind their peers in learning to read (Adams, 1990). If participants fall behind in reading achievement they usually remain behind throughout their schooling (Stanovich, 1986). Preschool is a critical period in the lives of children and teachers must position preschoolers for successful transition into kindergarten.

Overall the importance of phonemic production instruction is demonstrated in this study supports the research of De Graff & Torgesen (2004). Using a phonemic spelling test, which required production of phonemes, participants saw an increase in their letter sound knowledge and ability to decode phonemes, which is a prerequisite skill in reading and even alliteration activities. The researchers concluded that the phonemic spelling test was a reliable and valid measure of the above skills as well as a promising and reliable measure of alphabetic reading skills in young children. This supports the need for instruction in phoneme production for young children not only for benefitting the initial early stages of reading but also impacts future academic content such as spelling.

Research Question Two

What are the effects of explicit rhyming instruction on the rhyming skills of participants?

Explicit rhyming instruction provided a dramatic increase in the rhyming skill level of all participants in this study. The multiple baseline design employed in this study allowed for a systematic analysis of the ability to select pictures that represented rhyming words across participants that demonstrated a functional relationship with explicit instruction. This is similar to the results for phonemes. Prior to the beginning of the study, the criteria that needed to be met before participants could move to the next phase of the study was stable responding. Stable responding was defined as a consistent data pattern that allows the researcher to predict future data within a range if the experimental conditions remain the same (Cooper, Heward & Heron, 2007). All participants met the criteria and were moved to the next phase which was removal of instruction. This

removal of rhyming instruction coincided with the introduction of explicit instruction in alliteration. This exchange occurred in order to maintain the integrity of this experimental design. Also embedded in the multiple baseline design was an ABA design or return t baseline. The ABA design further demonstrated that the explicit instruction impacted the participant's ability to match rhyming words. When the explicit rhyming instruction was removed the participant's ability to match rhyming words decreased and did not return until discrimination instruction was implemented.

Prior to the implementation of the independent variable, two participants started with the ability to select rhyme matches during baseline conditions. Participant 1 and Participant 5, a treatment and comparison participant, had variable responding prior to explicit instruction.

Participant 1's variability occurred in two ways during baseline. Participant 1 saw variability across sessions in terms of how many correct and incorrect matches he had as well as variability in the net amount of cards he encountered during each session. For example, a visual analysis of his data show that his correct responding varied from 3 matches in sessions before and after a session where he responded correctly six times. This supports the first conclusion regarding Participant 1's variability. Secondly, his incorrects and corrects were occurring at virtually the same level (i.e., 6 correct and 7 incorrect matches during a testing trial versus 3 correct responses and 3 incorrect responses during a testing trial) and that level varied from session to session. In another look at Participant 1's graphs (Figure 4.1) show that for sessions 4-7 show variable responding occurring at the same level for both corrects and incorrects.

Additionally, levels of scores also varied in the first condition. His range for this phase of 2 to 7 for incorrects and 2 to 13 incorrects suggest that Participant 1 was sensitive to certain categories of rhyming words (i.e., he could pick out "_at" pairs and not "_ing" pairs). Because administration directions state that the flashcards are to be shuffled prior to testing to allow for some level of randomness, certain categories of rhyme pairs would show up at sessions and at some points Participant 1 would not encounter that same pair at the next administration, which could influence his scores.

Participant 5's variability was less apparent. Variability was noted in Participant 5's incorrect responding during baseline. Her range of responding was from 0-9 responses for that phase. In session one, Participant 5 had an actual score of four incorrect responses and repeated that core for 4th session. The second and third session of the baseline revealed scores of one incorrect response. The 5th session had nine incorrect responses and after this session, Participant 5's responding stabilized at either one or no incorrect responses. Data notes revealed no extenuating circumstances for this variable responding.

The other four participants were not able to pass the assessment pretest and therefore were "unable to be sampled" (UNS) during baseline. After implementation of rhyme awareness instruction, all participants saw increases in their ability to select rhyming matches, with the exception of Participant 6. Coupled with visual analysis of the graphs, a functional relationship was seen between the rhyming skill level of participants and explicit instruction according to the characteristics of the multiple baseline design as well as the embedded ABA design.

Responding by all participants responded positively to rhyming explicit instruction. After the introduction of the independent variable, all participants' scores reflected a steady increase in the number of correct matches as well as a decrease in the number of incorrect responses during assessment sessions. From the first data point after the introduction of rhyming explicit instruction to the last data point, the participants that did not evidence rhyming ability (Participant 2, Participant 3, Participant 4) were able to multiply by five the amount of correct rhyming matches obtained during testing sessions.

For the two participants who evidence rhyming skill prior to the introduction of rhyming explicit instruction, initializing training proved to stabilize their responding and decrease their incorrect responding. Visual analysis of Participant 1's data show a little bit of variability in sessions 13 and 14 where he had the highest scoring of that phase (19 and 18 correct responses respectively), but overall his responding remained fairly stable at 10 to 13 correct matches during the explicit rhyming instruction phase.

Participant 5's data provide a similar picture to that of Participant 1's data. Her responding showed a steady increase from the beginning of the phase to the end of the phase. The number of correct matches for the beginning of the phase was around 15 to 16 correct responses to nearly 30 correct responses by the end of the phase. Participant 5 also experienced 2 sessions of lower than average responding during this phase and observation notes indicate that she complained of wanting to see her mother and was not very attentive during the testing session for the first instance. The second instance occurred after Participant 5 had been absent from school due to illness.

Removal of instruction or Baseline 2, occurred during the third phase of this study. All participants saw a drop in their responding as a result of explicit rhyming instruction not occurring. The participants' responding did not return to baseline levels after the removal of instruction, which shows retention of the previously taught skill. Upon introduction of the discrimination training, all participants saw their intervention levels of responding return and grow. This growth also maintained after the conclusion of the study as well as during the check for maintenance.

These effects of the interaction between participants' responding and explicit rhyming instruction are supported by prior research in the field (Bernhardt & Major, 2005; Bradley & Bryant, 1985; Foy & Mann, 2004; Missal, McConnell and Cadigan, 2006). Foy and Mann (2001) analyzed the effects of rhyme awareness and propose that rhyme awareness prepares participants for preschool measures that highlight phonological awareness skill sets. This preparedness can also translate to future skill sets such as manipulation of the language and more complex English language skills used by older children (Stemberger, 2004). This finding is also supported by Yeh (2003) who also found a functional relationship between explicit instruction in rhyme and related phonological awareness skills. Additionally, Treiman et al. (2008) also found that rhyme instruction also informed participants' knowledge about phoneme production when it related to the equivalent letter name.

Participant 6's rhyming ability was unable to be detected by the measures included in this study. Participant 6 participated in the same rhyming explicit instruction as the other participants and even during trials he was unable to sustain evidence of

rhyming ability. He was able to select correct matches on some cards during trials, but that correct selection cannot be upheld against the possibility of him engaging in guessing behavior. Moreira and Hamilton (2006) suggest that standard measures of rhyming ability may not be able to correctly assess the rhyming skill that English language learners (ELLs) exhibit. In their analysis, the Early Literacy Profile (ELP), was reviewed and the authors concluded that the method of testing may not be the most effective when used with ELLs. The ELP uses a stimulus picture as well three horizontal pictures that are the basis for the rhyming selection. This is the same format of the GGG assessment used in this study. The ELP also employs the same methodology for assessment that is used in the GGG. The teacher points to each picture and identifies that picture, and then the participant is asked to point to the picture (in the GGG the participant is required to vocalize his or her choice).

Moreira and Hamilton (2002) frame their argument in the theory that spoken language and thought are not always directly correlated and that abstract concepts can be transferred from the native language to the target language without specific labels. This occurs because the abstract concepts are not dependent on language. It is the application of this theory that explains Participant 6's inability to translate his rhyming skill through the GGG. Because Spanish is a language that does not depend on rhyme, nor is rhyme taught in early literacy acquisition for these participants, application of rhyming methods in their acquisition of another language is not effective. Additionally, the use of visual images in order to assess this skill, and potentially others, may lead to a false representation of their ability level. The errors that ELL participants make are related to

their use of semantic cues to make their choice of a picture, which accesses a higher level of cognitive processing, than using their rhyming ability. The implications stressed by the authors of these miscues are that when these methods of rhyming assessments are used, failing results are often obtained and ELL participants are thought to not possess the skill. Their recommendation to educators are to look at the type of errors that ELL participants are making and then complete additional training with these participants on the strategy of rhyming as well as the skill fo rhyming. This additional training was not employed with Participant 6.

Research Question Three

What are the effects of explicit alliteration instruction on the alliteration skills of participants?

Data from this study show the positive effects of explicit alliteration instruction on the ability of participants to select alliteration matches. A systematic analysis of this functional relationship occurred through visual analysis of the data as well as analysis of the mean scores. The multiple baseline design also provided evidence of the functional relationship between explicit instruction and alliteration skill. Prior to the implementation of instruction, only two participants, Participant 5 and Participant 1, were able to show evidence of the ability to alliterate. The other participants were unable to pass the Get it, Got it, Go prestest in order to enter into the full test administration. Participants were in the baseline condition for an average of 20 sessions. After implementation of the phonemic awareness instruction, all participants saw increases in their productions. The

visual analysis of the graphs, seen in the second phase, shows a functional relationship between the ability of participants to select alliteration matches and explicit instruction.

Participants did not experience an embedded ABA design for this skill. Time concerns as to the length of the study and the resulting time available prior to kindergarten testing necessitated the need to not include a removal of explicit alliteration instruction. It was the concern of the researcher that the advent of kindergarten placement testing in the Reynoldsburg School District would prompt parents and teachers to start instruction in letter names and sounds and possibly even rhyming activities. Participants moved directly from the alliteration condition into discrimination training. Concerning alliteration instruction, discrimination training provided training similar to that in the explicit alliteration instruction condition as well as the addition of explicit instruction in the relationship between alliteration skill and phoneme production. This additional instruction was referred to as compound instruction in the section describing the procedures regarding discrimination training as well as the discussion of the results of the discrimination training.

Visual analysis of the data shows a steady increase in the skill level of participants from the beginning of explicit alliteration instruction through maintenance checks. Participants saw an immediate increase of their ability to select correct alliteration matches after explicit alliteration instruction. Researcher comments during the course of instruction highlight an important correlation between baseline 2 measures for rhyming and explicit alliteration instruction. Specifically, participants were having difficulty deciphering between the assessment cards during tests for rhyming ability and alliteration

ability. For example, even with the pretest measure built into the assessment instrument, during the course of administration, the researcher would note that participants would sometimes become confused as to which skill was being assessed. For instance, participants may have taken an extra ten seconds on the alliteration cards to find a word that rhymed and if they could not find one, they would respond with a spontaneous rhyme that started with the same letter as the stimulus picture. This same phenomenon did not occur with the same frequency on rhyming tests with spontaneous alliteration matches. Neither of these findings were reported by authors who used this measure in their research (Missal et al., 2006; McConnell et al, 2002).

Support for explicit instruction in alliteration with a combination of discrimination training is not available. Researchers have studied skills that highlight initial sounds in words in a multiple skill intervention (Holm, Farrier & Dodd, 2008; Wehby, Lane & Falk, 2005), but those interventions included other more complex phonemic awareness skills such as segmentation and blending as well as tests for fluency in decoding nonsense words. Researchers have seen an increase similar to these findings in alliteration skill when it is couple with less explicit forms of instruction (Missal et al, 2006). Overall, this literature provides support that instruction in varieties of alliteration skill, whether it is non-explicit or included in a phonemic manipulation treatment package provides the basis for a functional relationship to occur showing an increase in participant's skill level.

Research Question Four

What are the effects of explicit language instruction on the differences between the above skills (i.e. discrimination) on the phonemic awareness, rhyming and alliteration skills of participants?

Discrimination training was provided to participants in order to link the component skills of phonological awareness (phonemic awareness, rhyme awareness and alliteration awareness) together. The goal of this training was to see if by linking the relations between the three skills, the overall mean score would increase for all participants. All participants saw an increase in each of the component skills as compared with the responses observed during the individual explicit instruction sessions. Because the skills were taught during the same lesson the participants demonstrated improved skills in differentiation of the phonological skills. The most dramatic increase is the increased responding seen across all participants after the implementation of discrimination training. Two participants, Participant 3 and Participant 5, were able to nearly attain the correct production of the twenty six sounds that were used in this study. Their responding also maintained throughout the conclusion of the study after instruction had ceased.

For rhyme awareness, discrimination training was comprised of an extended period of explicit rhyming instruction. While relationships were taught (i.e., the difference between rhyme and alliteration and which part of the word retains the focus during each), a compound skill was not taught with rhyme discrimination training. The other skills, awareness of alliteration and phoneme production included compounded skill training. For instance, the relationship between phonemes and the initial sounds of words

(alliteration) was stressed as opposed to the initial explicit alliteration instruction that occurred in earlier in the study. Participants were told that the initial sound in the word is comprised of a phoneme (blended sounds were not stressed) and that it was the same phoneme that they were learning during explicit phoneme instruction. Similarly, participants were reminded of this compound relationship during phoneme instruction. During training, participants were reminded that two words that started with the same phoneme showed evidence of alliteration. The differences between the two instructional strategies are small, but the researcher made every effort to stress phoneme production during phoneme discrimination training and to stress initial sounds of words, or the beginning sounds of words during alliteration discrimination training.

Support for this type of specific type of training sequence was not found in the literature. In research reviewed for this study, evidence was shown of participants engaging in instruction of multiple skills (Bursuck et al, 2004; Bryant et al., 1990; Foy & Mann, 2006), but researcher failed to explicitly teach the relationship of the skills.

Research Question Five

Will the participants maintain the language skills developed during the intervention after the instruction has ended?

Overall, participants maintained each of the skills that were explicitly taught after instruction ended and after the conclusion of the intervention phases of the study. Maintenance checks that occurred two to three weeks after the conclusion of the study show that participants were able to maintain the skill at levels that were the same as during intervention or higher. Specifically, for phoneme production, participants, with the exception of Participant 2 were able to increase their production of phonemes at the

maintenance check. Participant 2's maintenance of this skill, and others as will be addressed later in this section, were poor, even after the introduction of discrimination training. Of concern for the researcher was the lack of the ability of all participants to maintain criterion level performance after the conclusion of the initial training in phonemic awareness. Two participants, Participant 1 and Participant 2, returned to near baseline levels of performance during the 2nd baseline. For the participants that maintained performance at higher levels, visual analysis of their data show responding that was highly variable from one session to the next. This lack of maintenance so soon after the cessation of training suggests that participants should have remained in explicit instruction for a longer amount of time and that they did not have enough time to securely infuse the behavior of phoneme production into their repertoires.

Similarly, responding associated with rhyme awareness experienced some attrition after the removal of instruction. During the second baseline, mean responding fell for all participants with the exception of one participant, Participant 2. Visual analysis of the data show that the responding fairly steady responding for all participants during the second baseline. Lack of maintenance could be associated with several reasons in this study. Researcher comments indicate that participants had trouble deciphering between the assessment cards once they learned to rhyme and alliterate. Also, alliteration training focused on a different part of the word and therefore participants may have been so consumed with trying to learn alliteration that rhyming responding was not as automatic.

Maintenance of alliteration awareness was assessed differently than the prior two skills. Participants did not experience removal of alliteration explicit instruction in this study due to time constraints. Supported by mean scores and visual analysis, participants were able to continue to grow with acquisition of alliteration skill and retain that skill through maintenance measures.

Encouragingly, discrimination training provided the additional instruction that participants needed to solidify their phonological awareness skill sets. Specifically, phoneme production increased and maintained during and after discrimination training as well as rhyme awareness. Although a functional relationship was established in the increased responding that occurred across all conditions after discrimination was implemented. Unfortunately, a causal relationship as to whether it was the increased training or the introduction of discrimination and relational training that attributed to the increase in responding cannot be determined.

Research Question Six

What are the effects of using the computerized version of an Individual Growth and Development Indicator (IGDI), the Get it, Got it, Go in comparison with the traditional format of the GGG?

In determining the differences between both formats of the Get it, Got it, Go (GGG), it is necessary to understand the questions that must be answered as to the effectiveness of the assessment tool. McConnell, McEvoy and Priest (2002) suggest hat in the creation of a data collection tool to assess academic skills, one must not only attend

to the child behavior that needs to be assessed, but also the technical and logistical demands of general outcomes measures which include individual growth and development indicators (IGDIs). That is, the assessment tol must not only have the ability to tell you the current skills of the child but also have some predictive qualities.

In the creation of the traditional format of the GGG, researchers looked at the reliability, validity and ease of use in comparison with other formats of assessing the same behaviors (McConnell, McEvoy & Priest, 2002). Similarly, the researcher looked most specifically at the reliability and validity of the measure. The ease of use of the measure would only include the report of the researcher as she was the only one to use the program.

Reliability was assessed in two formats, the first with the researcher serving as the second observer to the measures taken by the computer program and the second involving both the first and second observers as additional data collectors to compare results with the computer's results. Reliability was high for both methods, the rhyming test has an agreement of 99.8% (range 94-100%) and 98% (range 67-100%) for the alliteration test. The low score of 67% for an alliteration session was the difference of the researcher selecting 2 correct responses and the program recording 3 correct responses. The results indicate that the computerized version of Get it, Got it, Go is accurate and reliable.

Validity was assessed on the ability of the computerized format being able to record the behavior as accurately as the traditional format. Validity also included the sensitivity of the instrument in relationship to the behaviors measured as well as the

difference in results in comparison with the concurrent standardized measure. For example, the instrument needs to be able to be sensitive enough to measure the behavior of participants as well as measure a behavior that is developmentally appropriate to the age level of participants being assessed (McConnell et al., 2002).

In looking at the mean and range scores of the participants, both formats seemed to capture the same scores. This is determined by looking at the individual scores of participants assessed using the computerized version. The ranges of participants' scores across formats show the strong similarities of the computer and traditional versions. It can be misleading to consider only the mean scores as they can change depending upon when the sessions occurred for both formats. In a visual analysis of the graphs, the actual scores obtained from the computerized version are not outliers in comparison to traditional format. It is reasonable from the results obtained in this study to say that the computerized version of the software was a valid measurement tool for these participants and its' performance did not vary significantly from the traditional format of testing. In other words, there were no important differences between participants responding based on type of assessment.

Ease of use is the last characteristic that McConnell and colleagues (2002) suggest for data collection tools. They also state that ease of use is a variable that should be taken into account when measures of validity and reliability are within acceptable guidelines. In the development of the original GGG, the authors state that factors such as classroom use, child interaction and practicality should dictate how classification is made along the continuum of ease of use.

Following the recommendation of McConnell, one of the creators of the GGG, the researcher used a touch screen 12.1" computer in this study. McConnell suggested that being able to have a computer, or even hand held device that could be placed between the participant and researcher would be ideal and easy to use in the applied setting. The touchscreen format of the computer allowed for the computer to be folded flat and placed either in the lap of the researcher or the participant or on the floor between the participants. In this study, the computer was placed on the table in between the researcher and participant. This format made it easier to use over the traditional format where approximately 200 flash cards needed to be shuffled in order for randomization. The computer also effectively stored participant's responses for later analysis.

Child responsiveness and engagement are reported by the researcher to be higher with this format in comparison to the traditional format of the assessment. It is unclear whether it was the novelty of the touch screen laptop that led to this higher engagement or other variables as it was not a variable analyzed in this study.

The computerized format can lead to some limitations which will be discussed more in depth later in this chapter. Overall, this format was able to be shown to be reliable, valid and easy to use as an assessment alternative with these participants. However, this is an initial study and there needs to be more field testing of this computerized version of Get it, Got it, Go.

Research Question Seven

What are children attitudes about the instructional activities?

All of the participants reported a positive experience regarding the intervention used in this study. The questions ranged from liking the individual skills that were addressed in this study (phonemic awareness, rhyme awareness and awareness of alliteration) to whether or not seeing the graphs and thinking that the skills were important. The questions that were asked were aimed at getting a sense of the participants' ideas of social importance regarding the intervention as well as the personal importance of the intervention.

All participants, with the exception of Participant 2, anwered yes to the all of the questions included on the questionnaire. Participant 2's answers to questions two, four and six were coded as "no response" and the teacher completing the assessments reported her inability to understand importance, even with the alternative words of important to school and special were used. Participants also had the opportunity to record comments and perceptions at the end of the questionnaire and no participants elected to do so.

Comments recorded by the researcher during the course of the experiment support the evidence obtained by the teacher at the conclusion of the study. Explicit instruction occurred during circle and center time for participants and overall the researcher had no problems requesting attendance for the intervention from participants. The only times when participants decided to not leave with the researcher promptly in the study were when more reinforcing events, such as special activities or events were occurring in their classroom. During these times participants asked to be taken from the classroom after the end of the event or requested to trade time slots with other participants in the study. Lastly, positive comments regarding the computer assessment were stated by participants

during the study. These comments ranged from being excited when assessment sessions included the computer to being disappointed when the computer was not used. The researcher, towards the end of the study, comments on some participants' data sheets that she found them counting along when the traditional flashcard format of the assessment was used so that they could know in advance how many correct and incorrect matches had been made for the session.

Research Question Eight

What are the teachers' attitudes about the instructional activities and the participants' progress and skill achievement obtained through this study?

The questionnaires indicate that both of the classroom teachers responded favorably to the phonological awareness intervention. The questions presented to teachers centered around three subject areas: (1) the intervention itself, (2) any observed difference in participant behavior and, (3) their ability to implement a similar intervention and testing format in their classroom.

Both of the classroom teachers responded favorably to the questions related to the effects of the intervention as well as to the skills selected for intervention in this study. Both teachers responded "somewhat agree" (value=4) to if they observed that explicit instruction improved the phonological skills of participants. In response to the appropriateness and importance of the skills in relationship to kindergarten, teacher one responded "somewhat agree" (value = 4) and teacher two responded "strongly agree" (value = 5). These responses indicate that the classroom teachers saw positive changes in participant skill level as a result of the explicit instruction. It also shows that the teachers

believed that phonemic awareness, rhyme awareness and awareness of alliteration were important skills to target during the preschool year prior to entrance into kindergarten.

In response to the observed (i.e., the participants enjoyed participating in the study), teacher one scored this question as "strongly agree" (value = 5) and "somewhat agree" (value = 4) was the response of teacher two. These responses are also supported by the additional comments provided by each teacher. For example, teacher one indicated that she saw the participants engaging in related behavior (i.e., singing the song during dramatic play, spontaneous rhyming and participants mentioning alliteration) and that was also supported by comments provided by teacher two. This is important in that it shows that the participants not only showed the skill during instruction and testing in relationship to the study, but also showed behaviors that would lead to the conclusion that they had internalized ability to rhyme and connected it to novel experiences not associated with the study.

Lastly, both teacher indicated that explicit instruction was a viable option for them to add to their arsenal of teaching tools and that they saw that explicit instruction would be fairly easy to implement as well as testing using the computer format of the Get it, Got it, Go (GGG). The mean average for teacher one on the implementation of this intervention was a 3.8, a value just shy of "somewhat agree." In response to her ability to implement the computerized version of the GGG, she stated that she could neither agree

nor disagree with the question. Teacher two's mean score for this category was a 4.5 which corresponds to a value between "strongly agree" and "somewhat agree."

In total, the teachers responses support the social validity of this study in not only its applicability to this age group in terms of kindergarten preparedness, but also more locally to the skill level of the participants. The classroom teachers were also able to support participant data that indicated they liked participating in the intervention. As far as implementation of the intervention, scoring indicates that teacher view this as an intervention they could implement, one they could implement without difficulty and that adding the computerized format would overall be a positive addition to their current testing measures.

Contributions to the Field

The results of this study support prior research that explicit instruction in elements of phonological awareness translate into the ability of participants to acquire the skill, increase their responding and maintain the skill after instruction has ceased (Ehri et al, 2001). More importantly, this study may address the divide that is seen in early reading research which suggests that instruction in segmentation and blending or rhyme and/or alliteration awareness are mutually exclusive modes of phonemic awareness training. Lundberg (1988) investigated the effects of explicit phonemic awareness (segmentation and blending) instruction and rhyme awareness on the prereading skills of participants. Results showed that rhyming instruction had a modest effect on phonemic tasks, where

explicit instruction in segmentation and blending yieled dramatic results. Yeh (2003) also proposed that Head Start participants saw a greater increase in phonemic ability when taught explicitly in segmentation and blending rather than through rhyme awareness training.

It is not the position of the researcher that early reading needs to include either or, but rather that instruction needs to occur on a continuum rather than categorically. In looking at the skill level of the participants in the present study, participants were not able to produce phonemes nor did they seem to have a concept of the sounds of the English language. Participants also did not have an effective skill level in terms of alliteration activities and two participants had a modest level of skill concerning rhyme awareness. For these participants, to start out with segmentation and blending activities would have proved to be developmentally inappropriate for their age level. While it is understood that rhyme awareness and even alliteration awareness alone do not provide sufficient support for the phonological awareness (Juel, 1988; Schneider, 1997), they can be vehicles for younger children to access more complex phonological awareness skills such as onset-rime awareness and phoneme substitution, deletion and other similar activities.

The discrimination training used in this study provides an interesting point in terms of phonological awareness explicit instruction. Because the skills were taught during the same lesson the participants demonstrated improved skills in differentiation of the skills. Early reading research supports the need for explicit instruction in

phonological awareness skills (National Early Literacy Panel, 2007; National Reading Panel, 2000), but including discrimination of how these skills relate does not share the same availability of support. Participants in this study were able to see a functional increase in their skill level after implementation of training, but maintenance of the ability to produce phonemes did not produce a desirable effect. The origin of why the skill did not maintain is purely suppositional, but the reintroduction of discrimination training, which also included added instruction in phoneme production provided the level of maintenance that the researcher desired. The effects seen in this study allow for more questions and research to address this phenomenon.

The field of assessment has seen a dramatic increase in terms of the modes and methods available to teachers. With the demands of No Child Left Behind, the necessity of curriculum based measures and the desire of teachers to instruct participants individually and appropriately, assessment needs to meet the growing needs demanded by the profession. The computerized format of the GGG provided a valid and reliable method for assessment in comparison to the traditional flashcard format of the IGDI. The contributions can be seen in a beginning line of research which looks at the ability of a computerized format that can bypass the possible limitations of the flashcard format. The current format of the GGG can be sensitive to elements that the experimenter brings to the table. The rate at which flashcards are presented are specific to the experimenter as well as the level of randomization that occurs are factors that can dramatically influence

participant scoring. As seen with the researchers previous research, which led to the creation of this new format of the GGG, participant scoring was dramatically influenced when a second observer tested participants as well as the duplication across sessions of the cards that were presented to participants for testing. Other variables which provide support to the need of a computerized version of the IGDI are the normal wear the flashcards experience during assessment as well as the transportability of the cards from one site to another.

Limitations

This study presents several limitations which need to be considered. Primarily, this study was conducted with only six participants who have been in care at the center an average of 2 years prior to their entrance into this classroom and therefore selection for participation in this study. While no related activities were seen during baseline that would contribute greatly to their phonological awareness skills sets, it is known that the program as a whole focuses on literacy-rich activities for children that attend the center as well as their families. As a derivative of Head Start as well as supporting literacy-rich environments for children, the researcher created this early childhood program at the center with those initiatives in mind. Therefore, extrapolating these results to children who have not been a part of organized care (day care, family child care or literacy-rich family backgrounds) should be done with care.

Secondly, this research was done in a pull-out fashion with each participant working one-on-one with the researcher. This environment provided the support needed for learning and skill acquisition that may not be found if these interventions were done inside the classroom. Early childhood classrooms are very busy and provide a lot of distraction, even during center-time, which is historically thought as a time to provide explicit instruction to individuals and small groups. As will be addressed in future research, the possibility of generalization should be assessed to other environments.

Issues of generalization should also be extended to the instructor. While early childhood professionals are being encouraged and supported to attain higher levels of education, the current levels of education that are required in the state of Ohio for teaching young children ages 6 weeks to the age of school-eligibility is a high school diploma and an age of 18 (Ohio Department of Job and Family Services, 2007). A knowledge base about early literacy activities as well as the need for a certain level of classroom management is necessary prior to successful implementation of awareness training as children need to exhibit attention skills in order to grasp the instruction being given. Yeh (2003) examined the effects of phonological awareness training and attention and found that attention skills were a necessary prerequisite prior to instruction.

The scope of applicability concerning the computer-based GGG and its comparison to the traditional format of the GGG is quite limited. The computerized GGG was only tested in this study and another study that was being run concurrently to this

one. The total number of participants having been tested with this instrument is eleven over a period of about seven months. The traditional format of the GGG was assessed on approximately 1500 participants prior to its initial use (McConnell, McEvoy & Priest, 2002). While this study met the standard measures of reliability and validity those measures are very small in number. Those measures are also based upon the creator being the primary experimenter and administrator of the assessment. The researcher had several advantages that would need to be addressed in future versions of this software. For one, she had been administering this assessment for several years prior to the beginning of this study and had administered this assessment to hundreds of participants. This afforded her knowledge of the icons and the associated words as well as an ease in delivering the assessment. The computer-based assessment used in this study depended upon the researcher knowing all of the words associated with the icons as there was not a separate screen that gave the words, such as what is included on the back of the flashcard in the traditional format.

Lastly, the ease of use of the computer-based assessment was addressed earlier in this paper. Limitations to this format of assessment include the availability of funding for computer or PDA purchase, the issues of transportability and the use of the computer in the classroom.

Future Research

The researcher suggests that future research needs to occur in the area of the computerized-based GGG, discrimination training as well as the role of phoneme production as an isolated skill set that needs to be taught prior to other phonological awareness skills.

Future research on the computerized version of the IGDI needs to include a wider dissemination and testing of the computer program with diverse populations of participants (e.g., other groups of exceptional children, typically developing children and older children). The advantages of doing this would include the ability to replicate results found with other research studies in using the traditional format as well as securing data on participants who already present with the skills assessed by this instrument in order to support sensitivity measures.

Future development with this computer-based assessment includes the option to export data to excel and the ability of an output screen to display icon names as well as be the main control of the assessment. These additions would provide for easier administration of this assessment and allow for those not familiar with the icons to access it as well. Another limitation addressed by this study was the transportability. Development would also extend to the ability of the assessment to be run using two PDAs or a combination of a PDA and touch screen laptop.

Lastly, future research will include a follow-up study of these participants one-year after the conclusion of the study as to their skill level in relationship to the variables

analyzed in this study. Because the current learning center is a feeder school to the greater school district, it will be relatively easy to include peer responding. The follow-up study will also include a peer analysis that will present information regarding their achievement in the areas of phonemic awareness, rhyme awareness and awareness of alliteration.

Conclusions

This study sought to analyze the effects of explicit instruction in phonemic awareness, rhyme awareness and awareness of alliteration. Included in this explicit instruction is the use of a discrimination training session where participants where participants encountered explicit instruction in each skill (phonemic awareness, rhyme awareness and awareness of alliteration), but also instruction in the relationship among the skills. This study also provided a basis for introducing a computerized format of the Get it, Got it, Go and to compare the results obtained from the computer-based version with the traditional format of the assessment.

Findings show that phoneme production increased when participants began explicit instruction in phoneme production. Participants also saw the emergence and/or increase in rhyming skills during explicit rhyming instruction. Additionally, alliteration explicit instruction promoted the emergence of alliteration skill in those participants who did not show evidence of the skill prior to instruction. Two participants showed evidence of the ability to alliterate prior to the beginning of their instruction. The responding of

these participants stabilized as well as showed growth in the increase of correct responding and the decrease of incorrect responding.

Discrimination training provided the opportunity for participants to receive additional explicit instruction in phoneme production, rhyme awareness and awareness of alliteration as well as the introduction to relationship among these skills and the differences inherent in these skills. Participants were able to either maintain their responding from the explicit instruction phase or their initial intervention levels of responding were recovered and increased until the end of the study.

Participants reported that they enjoyed the explicit instruction in phonemic awareness, rhyme awareness and awareness of alliteration as well as the discrimination training. They found the instruction important and enjoyed graphing their progress.

The beginning analysis of the computer-based assessment found it to be a valid and reliable assessment tool in this study in comparison with the traditional format of the Get it, Got it Go.

Future research will be focused on expanding the current instructional methods featured in this study as well broadening the generalization of the instruction to use with classroom teachers. Lastly, the design and ease of use of the computer-based Get it, Got it, Go will be reviewed.

REFERENCES

Adams, M.J. (1990). Beginning to read. Cambridge, MA: Harvard University Press.

Ashby, J. & Rayner, K. (2006). Literacy development: Insights from research on skilled reading. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy research, volume 2* (pp. 52-63). New York: Guilford.

Bailey, J. D., & Simeonsson, R. J. (1988). *Early Intervention for Infants & Children with Handicaps.* (S. L. Odom, & M. B. Karnes, Eds.) Baltimore: Paul H. Brookes.

Bernhardt, B. & Major, E. (2005). Speech, language and literacy skills 3 years later: A follow-up study of early phonological and metaphonological intervention. *International Journal of Language and Communicational Disorders,40*(1), 1-27.

Bowe, F. G. (2004). *Birth to Eight: Early Childhood Special Education.* Clifton Park: Delmar Learning.

Bowe, F. G. (2000). *Birth to Five: Early Childhood Special Education* (2nd Edition ed.). Albany: Delmar.

Brandes, J. A., Ormsbee, C. K., & Haring, K. A. (2007). From early intervention to early childhood programs: Timeline for early successful transitions (TEST). *Intervention in School and Clinic, 42,* 204-211.

Britto, P.R., Fuligni, A.S. & Brooks-Gunn, J. (2006). Reading ahead: Effective interventions for young children's early literacy development. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy research, volume 2* (pp. 311-332). New York: Guilford.

Bryant, P.E., MacLean, M., Bradley, L.L & Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology, 26*(3), 429-438.

Bursuck, W.D. & Damer, M. (2008). *Reading Instruction for Students Who Are At Risk or Have Disabilities.* Pearson/Merrill: Columbus, OH.

Bursuck, W.D., Munk, D.D., Nelson, C. & Curran, M. (2002). Prevention of reading

problems: Are Kindergarten and first-grade teachers listening? *Preventing School Failure, 47*(1), 4-9.

Bursuck, W.D., Smith, T., Munk, D., Damer, M., Mehlig, L. & Perry, J. (2004). Evaluating the impact of a prevention-based model of reading on children who are at risk. *Remedial and Special Education, 25*(5), 303-313.

Cambourne, B. (2004). Conditions for language learning: Explicit and systematic teaching of reading-a new slogan? *The Reading Teacher, 53*(2), 126-127

Carbo, M. (2005). What principles need to know about reading instruction. *Principal, 85*(1), 46-48.

Cartledge, G., Gardner, R. III, & Ford, D. Y. (2009). Diverse learners with exceptionalities: Culturally responsive teaching in the inclusive classroom. Upper Saddle River, NJ: Merrill/Pearson.

Castles, A. & Coltheart, M. (2004). Is there a causal link from phonological awareness to success in learning to read? *Cognition, 91*, 77-111.

Child Development Institute (2008). *Poverty and early childhood intervention.* Retrieved on June 8, 2008 from http://www.fpg.unc.edu/~snapshots/snap42.pdf.

Corcoran, M.E. & Chaudry, A. (1997). The dynamics of childhood poverty. *Challenge, 8*(1), 59-78.

Davis, G.N., Lindo, E.J. & Compton, D.L. (2007). Children at risk for reading failure: Constructing an early screening measure. *Teaching Exceptional Children, 39*(5), 32-37.

Dean, D. D. & Kuhn, D. (2006). Direct instruction vs. discovery: the long view. *Science Education, 91*, 384-397.

Deno, S.L., Fuchs, L.S., marston, D. & Shin, J. (2001). Using curriculum-based measurement to establish growth standards for participants with learning disabilities. *School Psychology Review, 30*(4), 50-524.

Dickenson, D.K. & Neuman, S.B. (Eds.). (2006). *Handbook of Early Literacy Research, Volume 2.* New York: Guilford.

Duncan, G.J. & Brooks-Gunn, J. (Eds.). (1997). *Consequences of growing up poor.* New York: Russell Sage Foundation.

Early Childhood Research Institute on Measuring Growth and Development (1998).

Research and development of individual growth and development indicators for children between birth and age eight (Tech. Rep. No. 4), Minneapolis, MN: Center for Early Education and Development, University of Minnesota

Ehri, C. (2004). Teaching phonemic awareness and phonics: An explanation of the National Reading Panel meta-analysis. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 153-186). Baltimore: Brookes.

Ehri, L.C. & Roberts, T. (2006). The roots of learning to read and write: Acquisition of letters and phonemic awareness. In D.K. Dickenson & S.B. Neuman (Eds.)., *The handbook of early literacy, volume 2* (pp. 113-134). New York: Guilford.

Ehri, L.C., Nunes, S.R., Willows, D.M., Schuster, B.V., Yaghoub-Zadeh, Z. & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the national reading panel's meta-analysis. *Reading Research Quarterly, 36*(3), 250-287.

Foy, J.G. & Mann, V. (2003). Home literacy environment and phonological awareness in preschool children: Differential effects for rhyme and phoneme awareness. *Applied Psycholinguistics,24,* 25-88.

Foy, J.G. & Mann, V. (2006). Changes in letter sound knowledge are associated with development of phonological awareness in pre-school children. *Journal of Research and Reading, 29*(2), 143-161.

Garber, H., & Begab, M. J. (1988). The Milwaukee Project: Preventing mental retardation in children at risk. 3rd ed. Washington DC: American Association of Mental Retardation.

Gargiulo, R. M., & Kilgo, J. (2000). *Young Children with Special Needs.* Albany, New York: Delmar.

Goswami, U. (2002). In the beginning was rhyme? A reflection on Hulme, Hatcher, Nation, Brown Adams and Stuart (2002). *Journal of Experimental Child Psychology, 82*, 47-57.

Guralnick, M. J. (2001). Early childhood inclusion: Focus on change. Baltimore, MD: Paul H. Brookes Publishing Co.

Guralnick, M.J. (2005). Early intervention for children with intellectual disabilities: Current knowledge and future prospects. *Journal of Applied Research in Intellectual Disabilities, 18*, 313-324.

Guthrie, J.T. & Humenick, N.M. (2004). Motivating participants to read: Evidence for

classroom practices that increase reading motivation and achievement. In P. McCardle & V. Chhabra (Eds.). *The voice of evidence in reading research* (pp. 329-354). Baltimore: Brookes.

Guthrie, J. T., & Wigfield, A. (1999). How motivation fits into a science of reading. *Scientific Studies of Reading, 3*(3), 199-205.

Hart, B. & Risley, T.R. (1995). *Meaningful Differences*. Baltimore: P.H. Brookes.

Hatcher, P.J., Goetz, K. Snowling, M.J., Hulme, C., Gibbs, S. & Smith, G. (2006). Evidence for the effectiveness of the early literacy support programme. *British Journal of Educational Psychology, 76,* 351-367.

Hebbeler, K., Spiker, D., Bailey, D., Scarborough, A., Mallik, S., Simeonsson, R., Singer, M., & Nelson, L. (January, 2007). Early intervention for infants and toddlers with disabilities and their families: Participants, services, and outcomes. Final Report of the National Early Intervention Longitudinal Study (NEILS). Technical Report prepared for the Office of Special Education Programs. Menlo Park, CA: SRI International.

Heward, W.L. (2009). *Exceptional Children: An Introduction to Special Education* (9th ed.). Upper Saddle River, NJ: Merrill/Prentice.

Hill, J. & MacMillan, B. (n.d.). An effective, research-based instructional approach to meet the needs of all participants: Direct instruction.

Hindson, B., Byrne, B. Fielding-Barnsley, R. Newman, C., Hine D.W. & Shankweiler, D. (2005). Assessment and early instruction of preschool children at risk for reading disability. *Journal of Educational Psychology, 97*(4), 687-704.

Holm, A., Farrier, F. & Dodd. B. (2008). Phonological awareness, reading accuracy and spelling ability of children with inconsistent phonological disorder. *International Journal of Language and Communication Disorders, 43*(3), 300-322.

Howard, V. F., Williams, B. F., & Lepper, C. E. (2005). *Very young children with special needs: A formative approach for today's children (3rd Ed.).* Upper Saddle River, NJ: Pearson.

Hooper, S. R., & Umansky, W. (2009). Young children with special needs. 5th ed. Upper Saddle River, NJ: Merrill/Pearson.

Individuals With Disabilities Education Improvement Act of 2004 (IDEA), Pub.L. No. 108-446, 118 Stat 2647-2808, (2004).

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology,* 80(4), 437-447.

Juel, C. & Minden-Cupp, C. (2000). Learning to read words: Linguistic units and instructional strategies. *Reading Research Quarterly, 35*(4), 458-492.

Kame'enui, E.J. (1993). Diverse learners and the tyranny of time: Don't fix blame; fix the leaky roof. *The Reading Teacher, 46*(5), 376-383.

Kame'enui, E.J. & Simmons, D.C. (2001). A primer on phonemic awareness: Why it's a good idea. *Basic Education: A Monthly Forum for Analysis & Comment,46*(3), 3-6.

Klinger, J., Cramer, E., & Harry, B. Challenges in the implementation of success for all in four high-need urban schools. *The Elementary School Journal, 106*(4), 333-349.

Lane, H.B., Pullen, P.C., Eisele, M.R. & Jordan, L. (2002). Preventing reading failure: phonological awareness assessment and instruction. *Preventing School Failure, 46*(3), 101-110.

Lane, K.L, Menzies, H.M., Munton, S.M., Von Duering, R.M. & English, G.L. (2005). The effects of a supplemental early literacy program for a participant at risk: A case study. *Preventing School Failure, 50*(1), 21-28.

Lonigan, C.J. (2006). Conceptualizing phonological processing skills in prereaders. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy research* (pp. 77-89). New York: Guilford.

Lyon, G.R. & Fletcher, J.M. (2001). Early intervention for children at-risk for reading failure. *Basic Education, 48*(8), 12-14.

Martin, S., Ramey, C., & Ramey, S. (1990). The prevention of intellectual impairement in children of impoverished families: Findings in randomized trial of educational daycare. American Journal of Public Health, 80, 844-847.

Mathes, P.G. & Torgesen, J.K. (1998). All children can learn to read: Critical care for the prevention of reading failure. *Peabody Journal of Education, 73*(3&4), 317-340.

McCollin, M. & O'Shea, D. (2005). Increasing reading achievement of participants from culturally and linguistically diverse backgrounds. *Preventing School Failure, 50*(1), 41-44

McConnell, McEvoy & Priest, J.S. (2002). "Growing" measures for monitoring progress

in early childhood education: A research and development process for individual growth and development indicators. *Assessment for effective intervention, 27*(4), 3-14.

McNamara, J.K., Scissons, M. & Dahleu, J. (2005). A longitudinal study of early identification markers for children at-risk for reading disabilities: The matthew effect and the challenge of over-identification. *Reading Improvement, 42*(2), 80-98.

Mesmer, H.A.E. & Griffith, P.L. (2006). Everybody's selling it—but what is explicit, systematic phonics instruction? *The Reading Teacher, 59*(4), 366-376.

Missall, K.N., McConnell, S.R. & Cadigan, K. (2006). Early literacy development: Skill growth and relations between classroom variables for preschool children. *Journal of Early Intervention,29*(1), 1-21.

Moreira, S. & Hamilton, M. (2006). Goats don't wear coats: An examination of semantic interference in rhyming assessments of reading readiness for English language learners. *Bilingual Research Journal, 30*(2), 547-555.

Morgan, P.L. & Fuchs, D. (2007). Is there a bidirectional relationship between children's reading skills and reading motivation? *Exceptional Children, 73*(2), 165-183.

Nagy, W.E. & Anderson, R.C. (1984). How many words are there in printed school English? *Reading Research Quarterly, 19*(3), 304-330.

Nancollis, A., Lawrie, B., & Dodd, B. (2005). Phonological awareness intervention and the acquisition of literacy skills in children from deprived social backgrounds. *Language, Speech and Hearing Services in Schools, 36* 325-335.

National Early Literacy Panel (2007, March). *Findings from the national early literacy panel: Providing a focus for early language and literacy development*. Paper presented at the meeting of the National Conference on Family Literacy, Orlando, FL.

National Institute of Child Health and Human Development. (2000). Report of the National Reading Panel. Teaching children to read: an evidence-based assessment of the scientific research literature on reading and its implications for reading instruction *(* NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

Needleman, R., Klaas, P. & Zuckerman, B. (2006). A pediatric approach to early literacy. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy, volume 2* (pp. 333-346). New York: Guilford.

Neuman, S.B. (2006). Connecting letters and sounds. *Scholastic Early Childhood Today,20*(6), 20-21.

Neuman, S.B., Celano, D.C., Greco, A.N. & Shue, P. (2001). *Access for all: Closing the book gap for children in early education.* Newark: International Reading Association.

Neuman, S. B. & Roskos, K. (1993). Access to print for children of poverty: Differential effects of adult mediation and literacy-enriched play settings on environmental and functional print tasks. *American Educational Research Journal, 30*(1), 95-122.

Nichols, W.D., Rupley, W.H., Rickelman, R.J. & Algozzine, B. (2004). Examining phonemic awareness and concepts of print patters of kindergarten participants. *Reading Research and Instruction, 43*(3), 56-81.

Noonan, M.J. & McCormick, L. (2006). Young Children with Disabilities in Natural Environments: Methods & Procedures. Baltimore: Paul H. Brookes.

Odom, S., & Wolery, M. (2003). A unified theory of practice in early intervention/early childhool special education: Evidence-based practices. *Journal of Special Education, 37*(3), 152-173.

Ohio Department of Job and Family Services. (2007). Center-based Child Care Manual. Columbus, OH: Franklin County Department of Job and Family Services Printing Office.

Page, E. B. (1972). Miracle in Milwaukee: Raising the IQ. Educational Researcher, 10, 8-16.

Phillips, B.M. & Torgesen, J.K. (2006). Phonemic awareness and reading: Beyond the growth of initial reading accuracy. In D.K. Dinkenson & S.B. Neuman (Eds.), *Handbook of early literacy, volume 2* (pp. 101-112). New York: Guilford.

Pullen, P.C., Lane, H.B., Lloyd, J.W. & Nowak, R. (2005). Effects of explicit instruction of struggling first grade participants: A data-based case study. *Education and Treatment of Children, 28*(1), 63-76.

Qi, S. & O'Connor, R. (2000). Comparison of phonological training procedures in kindergarten classrooms. *The Journal of Educational Research, 93*(4), 226-233.

Raver, S. A. (2009). Early childhood special education – 0 to 8 years: Strategies for positive outcomes. Upper Saddle River, NJ: Merrill/Pearson.

Richmond, J.B. & Janis, J. (1980). A perspective on primary prevention in the earliest years. *Children Today, 9*(2), 2-6.

Roskos, K. (2004). Early literacy assessment-thoughtful, sensible and good. *The Reading Teacher, 58*(1), 91-94.

Rothstein, R. (2004). The achievement gap: A broader picture. *Educational Leadership, 62*(3), 40-43.

Santi, K.L., Menchetti, B.M., & Edwards, B.J. (2004). A comparison of eight kindergarten phonemic awareness programs based on empirically validated instructional principles. *Remedial and Special Education, 25*(3), 189-196.

Schickedanz, J., Pergantis, M.L., Kanosky, J., Blaney, A. & Ottinger, J. (1997). *Curriculum in early childhood.* Boston: Allyn & Bacon.

Shankweiler, D. & Fowler, A. E. (2004). Questions people ask about the role of phonological processes in learning to read. *Reading and Writing: An Interdisciplinary Journal, 17*, 483-515.

Snow, C.E., Burns, M.S., & Griffin, P. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*(4), 360-407.

Stemberger, J.P. (2004). Phonological priming and irregular past. *Journal of Memory and Language, 50*, 82-95.

Strickland, D.S. & Shanahan, T. (2004). Laying the groundwork for literacy. *Educational Leadership, 61*(6), 74-77.

Torgesen, J.K. (2002). The prevention of reading difficulties. *The Journal of School Psychology, 40*(1), 7-26.

Torgesen, J.K. (2004). Lessons learned from research on interventions for participants who have difficulty learning to read. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 355-382). Baltimore: Brookes.

Torgesen, J.K., Alexander, A.W., Wagner, R.K., Rashotte, C.A., Voeller, K., Conway, T., & Rose, E. (2001). Intensive remedial instruction for children with severe reading disabilities: Immediate and long-term outcomes from two instructional approaches. *Journal of Learning Disabilities, 34*, 33-58.

Torgesen, J.K. & Mathes, P. (2000). *A basic guide to understanding, assessing, and teaching phonological awareness.* Austin, TX: Pro-Ed.

Treiman, R., Pennington, B.F., Shriberg, L.D. & Boada, R. (2008). Which children benefit from letter names in learning letter sounds? *Cognition, 106*, 1322-1338.

Troia, G.A., Roth, F.P. & Graham, S. (1998). An educator's guide to phonological awareness measures and intervention activities for children. *Focus on Exceptional Children, 31*(3), 1-12.

Vadasky, P.F., Sanders, E.A. & Peyton, J.A. (2006). Code-oriented instruction for kindergarten participants at risk for reading difficulties: A randomized field trial with paraeducator implementers. *Journal of Educational Psychology, 98*(3), 508-528.

Vaughn, S. & Roberts, G. (2007). Secondary interventions in reading: Providing additional instruction for participants at risk. *Teaching Exceptional Children, 39*(5), 40-46.

Wall, S., Taylor, N., Liebow, H., Sabatino, C., Mayer, L., Farber, M., et al. (2005). Early Head Start and Access to Early Intervention Services: A Qualitative Investigation. *Topics in Early Childhood Special Education , 25* (4), 218-231.

Wehby, J.H., Lane, J.H. & Falk, K.B. (2005). An inclusive approach to improving the early literacy skills of participants with emotional and behavioral disorders. *Behavioral Disorder, 30,*(2), 155-169.

Zill, N. & Resnick, G. (2006). Emergent literacy of low-income children in Head Start: Relationships with child and family characteristics, program factors, and classroom quality. In D.K.Dickinson & S.B. Neuman (Eds.)., *Handbook of early literacy, volume 2* (pp. 347-374). New York: Guilford.

APPENDICES

Appendix A

Minimum Components Under IDEA for a Statewide, Comprehensive System of Early Intervention Services to Infants and Toddlers With Special Needs (Including American Indian and Homeless Infants and Toddlers)

Table A

Minimum Components Under IDEA for a Statewide, Comprehensive System of Early Intervention Services to Infants and Toddlers With Special Needs (Including American Indian and Homeless Infants and Toddlers)

1. A rigorous definition of the term `developmental delay'
2. Appropriate early intervention services based on scientifically based research, to the extent practicable, are available to all infants and toddlers with disabilities and their families, including Indian and homeless infants and toddlers
3. Timely and comprehensive multidisciplinary evaluation of needs of children and family-directed identification of the needs of each family
4. Individualized family service plan and service coordination
5. Comprehensive child find and referral system
6. Public awareness program including the preparation and dissemination of information to be given to parents, and disseminating such information to parents
7. Central directory of services, resources, and research and demonstration projects
8. Comprehensive system of personnel development, including the training of paraprofessionals and the training of primary referral sources
9. Policies and procedures to ensure that personnel are appropriately and adequately prepared and trained
10. Single line of authority in a lead agency designated or established by the governor for carrying out:
    a. General administration and supervision
    b. Identification and coordination of all available resources
    c. Assignment of financial responsibility to the appropriate agencies
    d. Development of procedures to ensure that services are provided in a timely manner pending resolution of any disputes
    e. Resolution of intra- and interagency disputes
    f. Development of formal interagency agreements
11. Policy pertaining to contracting or otherwise arranging for services
12. Procedure for securing timely reimbursement of funds
13. Procedural safeguards
14. System for compiling data on the early intervention system
15. State interagency coordinating council
16. Policies and procedures to ensure that to the maximum extent appropriate, early intervention services are provided in natural environments except when early intervention cannot be achieved satisfactorily in a natural environment

Retrieved from the National Early Childhood Technical Assistance Center (June 6, 2008). http://www.nectac.org/partc/componen.asp?text=1

Appendix B

Early Intervention Skills, Definitions and Strategies

Table B. Early Intervention Skills, Definitions and Strategies

Skill	Definition/Directions	Assessment Strategy
Alphabetic Principle		
	(a) letters represent speech sounds (b) letters go together to make words (c) a change in letters results in a change in sounds and the words (Neuman, 2006; Foy & Mann, 2006)	(a) prediction-using context and knowledge of linguistics in order to guess; (b) decoding-conversion of individual letters and patterns of letters into sounds and blending those sounds; (c) analogy- using word parts including morphemes to analyze the structure of a word and (d) recall- retrieval of a known word from memory (Ehri, 2004; Mesmer & Griffith, 2006; Strickland & Shanahan, 2004)
Concepts about Print		
	The language of visual and auditory instruction, thought of as the social and task constraints of reading. (Nichols, W.D., Rupley, W.H., Rickelman, R.J. & Algozzine, B., 2004)	(a) Identification of the front of a book (b) Understand that print contains a message (c) Comprehends left-right pattern of reading (d) Directionality and spatial relations and positions (e) Knowledge of punctuation (Nichols, W.D., Rupley, W.H., Rickelman, R.J. & Algozzine, B., 2004)

Table B Continued

Oral Language		
	Oral language is facilitated when children have opportunities to use language through interactions in families or caregiving situations. (Strickland & Shanahan, 2004)	Interaction should promote opportunities for child to: (a) Create sounds by singing & participation in music making (b) Listen and respond to music, stories & discussions (c) Listening for various purposes such: enjoyment, response to directions, dialogue, attend to patterns in language (d) Engage in oral language activities that are linguistically, cognitively, and verbally stimulating. (Strickland & Shanahan, 2004)
Phonological Awareness		
Word Awareness	The awareness that the speech flow is a compilation of individual words. This awareness is typically achieved at a very young age.	Observation of the linguistic play of young children including rhyming, generation of nonsense words.
Syllable Awareness	The awareness that there are distinguishable units within words. This level of awareness is especially useful for the initial step in learning detection, segmentation, blending and	Segmentation of words through activities such as clapping, tapping and marching.

Table B Continued

<table>
<tr><td></td><td>manipulation of oral language.</td><td></td></tr>
<tr><td>Onset-Rime Awareness</td><td>The awareness that there is an intrasyllabic level of phonological awareness. It includes the analysis of a word between the level of phonemes and syllables. The onset is the part of the syllable that precedes the vowel and the rime is the rest of the syllable. These in an intermediate skill in phonological awareness.</td><td>Segmentation of words at the point between the onset and the rime.
<table><tr><td>Word</td><td>Onset</td><td>Rime</td></tr><tr><td>Cat</td><td>/k/</td><td>/at/</td></tr><tr><td>Dog</td><td>/d/</td><td>/og/</td></tr><tr><td>Black</td><td>/bl/</td><td>/ack/</td></tr></table>*Note: A syllable must contain a vowel therefore all syllable must have a rime, but not all syllables have an onset (e.g. and, out, or)</td></tr>
<tr><td>Phonemic Awareness</td><td>The awareness of phonemes, or the smallest sound unit in oral language. This level of awareness is achieved when children are able to manipulate individual phonemes.</td><td>Recognition of individual sounds in words “ Tell me the first sound in mat.”; listening to a sequence of separately spoken sounds and combining them to form a recognizable word “ What is /mmm/ /aaaaa/ /t/ ?”; breaking a word into its sounds by counting out sounds or positioning a marker for each sound. “How many phonemes do you hear in the word mat?)”; and recognizing what word remains when a specific phoneme is removed “What is mat without /mmm/?”

(Kame’enui & Simmons, 2001; National</td></tr>
</table>

		Reading Panel, 2000).
Word Level		
Tapping Words	Teacher reads sentence aloud. Child taps for each word in the sentence.	*The little frog is jumping.*
Deleting Words	Teacher reads a compound word, the child deletes one word	Teacher says, "*Say cowboy."* Child repeats. *"Now say cowboy without saying cow."*
Syllable Level		
Blending Syllables	Teacher reads one syllable at a time. The child listens, then blends the sounds together to make the whole word.	What do these sounds make? *Tea-cher*
Tapping Syllables	Teacher reads word aloud. Child taps for each syllable in the word.	*Alligator*
Deleting Syllables	Teacher reads child a multi-syllable word and the child deletes a specific syllable.	Teacher says, "Say *wonder*." Child repeats. "Now say *wonder* without saying *der*.
Onset-Rime Level		
Matching rhymes	Teacher gives child a word pair, the child decides whether or not to pair rhymes.	Do these two words rhyme? *Sack/black* Do these two words rhyme? *Beat/bean*
Blending onsets and rimes	The teacher segments a word orally between the onset and rime. The child listens, then blends the sounds together to make the whole word.	What word to these sounds make? *N-ote*

Generating rhymes	The teacher gives child a target word and the child must provide a word that rhymes with the target word.	Tell me a word that rhymes with *sat*
Phoneme Level		Table B Continued
Blending phonemes	Teacher segments a word into phonemes and the child is asked to blend the sounds to make the whole word.	What word to these sounds make? *B-o-th*
Segmenting phonemes	Teacher reads child a whole word and the child is asked to produce the word sound-by-sound.	I will say a word, then you say it sound by sound, *mat*

Adapted from Lane, Pullen, Eisele & Jordan, 2002

Appendix C

Assessments of Phonological Awareness and Subskills

Table C. Assessments of Phonological Awareness and Sub Skills

Assessment	Author/publisher	Description
Lindamood Auditory Conceptualization Test (LAC)	Lindamood and Lindamood/Pro-Ed	The *LAC* is a comprehensive, individually administered assessment for both childrenand adults. It is effective for a wide range of ages, however, it is difficult for very young children (kindergarten.)
Comprehensive Test of Phonological Processing (CTOPP)	Wagner, Torgesen and Rashotte/Pro-Ed	The *CTOPP* is an individually administered assessment that measures (a) phonological awareness, (b) phonological memory; (c) rapid serial naming
Test of Phonological Awareness (TOPA)	Torgesen and Bryant/Pro-Ed	*TOPA* is a measure of young children's ability to isolate individual phonemes in spoken words. It can be administered to groups of children and is available in Kindergarten and Early Elementary versions.
Phonological Awareness Literacy Screening (PALS)	Invernizzi, Meier, Swank and Juel/University of Virginia	*PALS* measures the child's rhyming abilities and sound awareness. In addition to these phonological skills, alphabet knowledge, letter sound knowledge, concept of word and word recognition are also assessed.
The Developmental Spelling Analysis in Word Journey	Ganske/Guildford Press	This assessment includes a screening inventory for determining a child's stage of spelling development and two parallel feature inventories for highlighting strengths and

Table C Continued

		weaknesses in a child's knowledge of specific spelling features.
Get it, Got it, Go	Early Childhood Research Institute on Measuring Growth and Development/University of Minnesota	This assessment includes three sections: (a) picture naming; (b) rhyming and (c) alliteration. It is effective for a wide range of ages, but it is sold for preschool programs.

Appendix D

Letter of Support from Participation Site

[Village Letterhead Here]

November 28, 2007

Temple Lovelace
Ohio State University
A 315 PAES
305 W. 17th Avenue
Columbus, OH 43210

Temple Lovelace:

This letter is to inform you of our acceptance of your proposal for research in our PreKindergarten room. I, as well as the teachers are delighted in what you plan to do with our students. While we have participated in research projects before for OSU, we are especially interested in yours because you will be working one on one with students. The teachers in the room, Ms. Corinne and Ms. Meagan are excited to see some of our students participate as well. We have secured the items and space that you requested for the study and please do not hesitate to call me if more needs should arise. Our contact information appears at the top of this page.

Sincerely,

[signature on file]

Betty Smith
On-Site Operator
It Takes A Village Learning Center

Appendix E

Letter of Consent and Letter of Information

[OSU Letterhead Here]

To the family of _____:

Your child is beginning an important program which focuses on phonological skills, which are the basis of beginning reading. This program helps to build the awareness regarding the English language that are needed for children to do well in school. Your child will learn to listen carefully, say things well, and follow directions. Your child will also be involved in reading activities, such as producing phonemes (sounds), rhyming and alliteration games that will help to increase the skills they need to begin reading.

This program will be a part of your child's daily learning curriculum, so it is important that they attend school every day. You may begin hearing your child making sounds, generating rhyming words or telling you that words alliterate. Please feel free to ask the teacher or myself about the program and what to expect in the coming weeks.

The program will last approximately 15 weeks and your participation is voluntary. The program will be conducted in small groups and will not interfere with the normal activity in the classroom. If you should feel that you would not like your child to continue, you can withdraw your participation at any time.

The most important thing that you can do is let your child know that the work they are doing with this curriculum is very important. It allows for them to practice with the language of school learning and helps them in preparation for their first year at the school-age level. Again, if you should have questions, please don't hesitate to contact me using the information below.

Sincerely,

Ralph Gardner
Associate Professor
The Ohio State University
gardner.4@osu.edu
(614) 292-3308

Temple Lovelace
Doctoral Candidate
The Ohio State University
lovelace.22@osu.edu
(614) 288-4628

Protocol # _____

CONSENT FOR PARTICIPATION IN RESEARCH

I consent to participating in (or my child's participation in) research entitled: **Preventing Reading Failure in At Risk Preschoolers: Directly Attacking Language and Literacy Deficits**.

Dr. Ralph Gardner, Principal Investigator, or his/her authorized representative Temple Lovelace has explained the purpose of the study, the procedures to be followed, and the expected duration of my (my child's) participation. Possible benefits of the study have been described, as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am (my child is) free to withdraw consent at any time and to discontinue participation in the study without prejudice to me (my child).

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: _____

Signed: _____
(Participant)

Signed: _____
(Principal Investigator or his/her authorized representative)

Signed: _____
(Person authorized to consent for participant, if required)

Witness: _____

Appendix F

Oral Consent

"For the next few months you are going to be doing a special project in Ms. _____'s and Ms. _____'s classroom. You are going to be able to meet in small groups with your friends and learn about your letters and what sounds they make. You will also learn how to rhyme words, like 'cat' and 'hat' and pick out words that start with the same letter like 'house' and 'home.' You will have to work really hard over the next few months, but you'll be able to have fun. Would you like to do this special project with Ms. Temple?"

Appendix G

First Observer Data Sheet

Child Name: _____

Date of Intervention: _____

Procedural Integrity Checklist Completion
□Yes □No

Mode
□Computer □Flashcards

Condition
□Baseline □Phoneme EI □Rhyming EI
□Alliteration EI □Discrimination □Maintenance

DATA

	Corrects	Incorrects
Picture Naming		
Phoneme Production		
Rhyming Matches		
Alliteration Matches		

IOA Completion

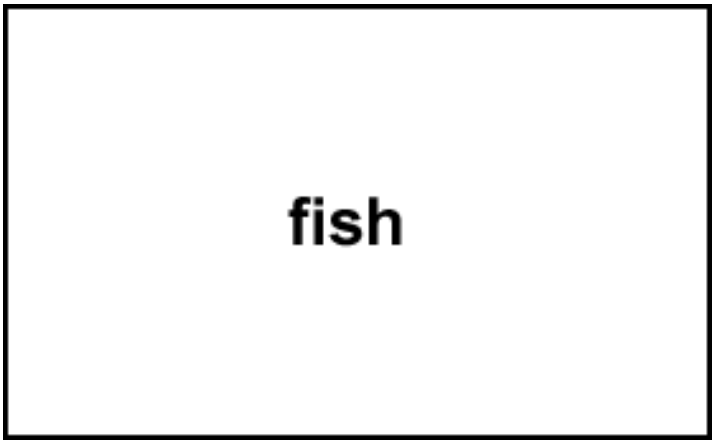
	Corrects	Incorrects
Picture Naming		
Phoneme Production		
Rhyming Matches		
Alliteration Matches		
Agreement	P PR R A	P PR R A

Session Notes:

Appendix H

Picture Naming Card

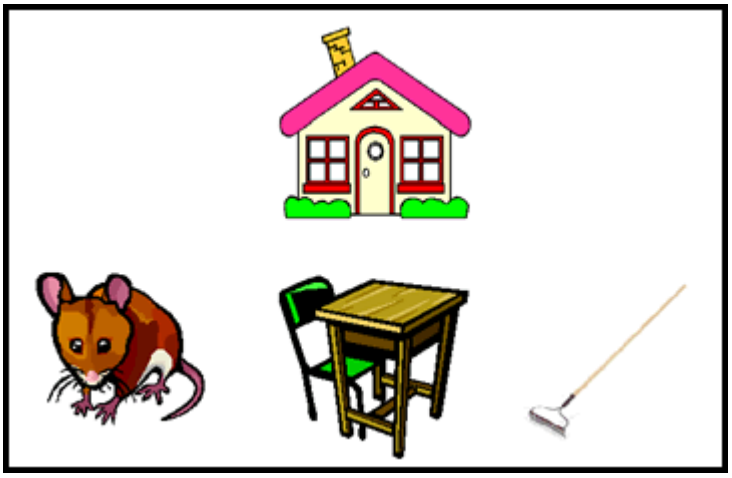
Front of Card (Faces Participant)



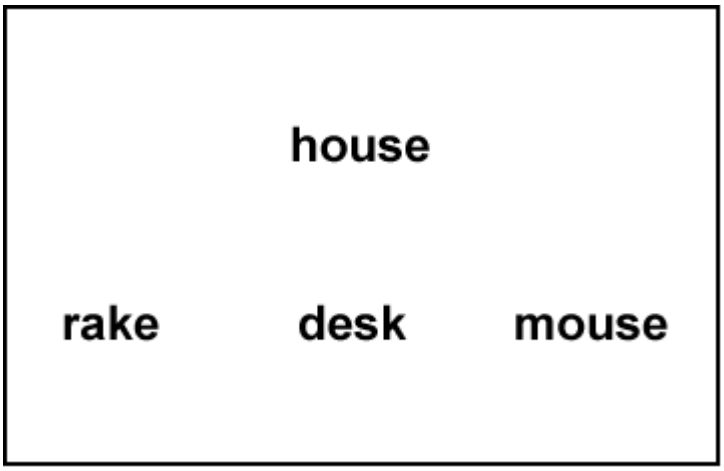
Back of Card (Faces Experimenter)

Appendix I

Rhyming Card



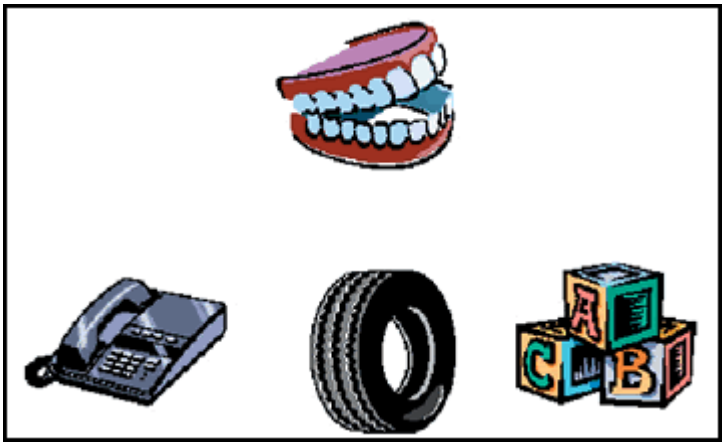
Front of Card (faces participant)



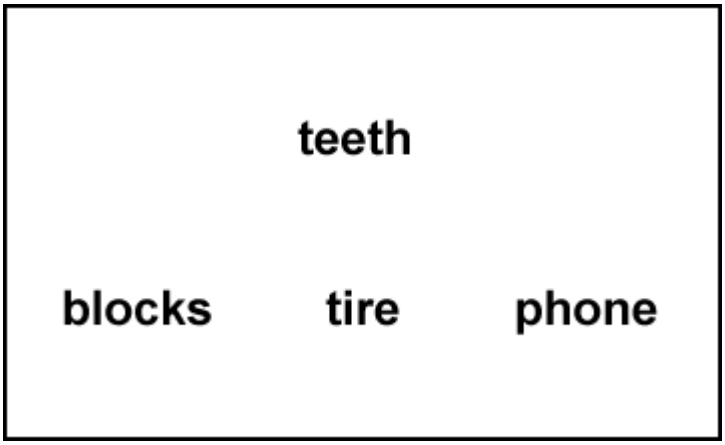
Back of Card (faces Experimenter)

Appendix J

Alliteration Card



Front of Card (Faces participant)

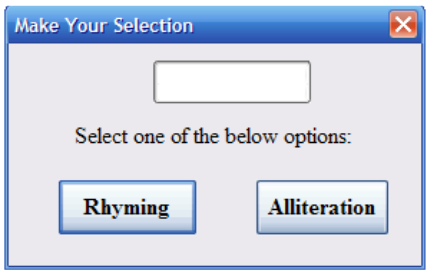


Back of Card (Faces Experimenter)

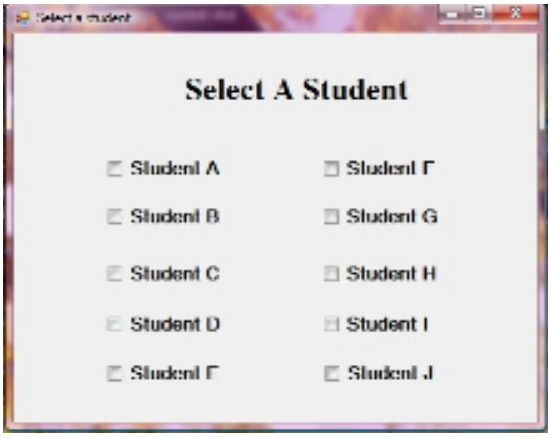
Appendix K

Computer Screen Shots

Screen One: Test Selection

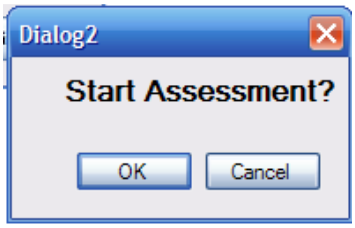


Screen Two: Participant Selection

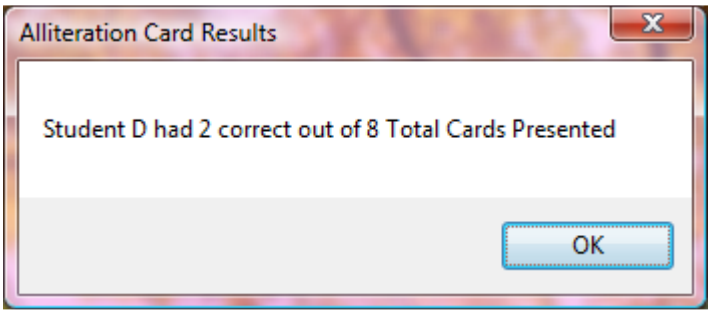


Screen Three & Screen 5: Sample Card Format (Same as Administration Card)

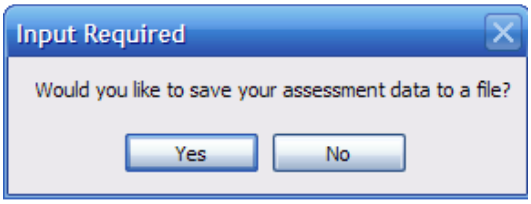
Screen Four:



Screen Six: Results Screen



Screen Seven: Save Screen



Appendix L

Child Questionnaire

Child Questionnaire

1. Did you have fun doing Ms.Temple's special project?
2. Do you feel like you know how to make letter sounds?
3. Do you think that it's important to know letter sounds?
4. Do you feel like you know how to rhyme words?
5. Do you think that it's important to know how to rhyme words?
6. Do you feel like you know how to alliterate?
7. Do you think that it's important to know how to alliterate?
8. Did you like working in a small group with your friends?
9. Did you like graphing your work?
10. Do you have anything else to say?

*Word substitution

Important=special, need to know for school

Appendix M

Child Questionnaire Response Card

Appendix N

Teacher Questionnaire

Instructions:

This questionnaire is in response to the extra instruction that has been provided to the participants you suggested participate in the study. Please answer the following questionnaire as completely as possible. Pay careful attention to the possible question responses as they are not listed in the same order for each question nor does each question have the same available responses. Please circle the response that best represents your observation of these participants. Thank you for your care in completing this questionnaire.

1. In looking at the entire group, explicit instruction was seen to improve the phonological awareness (phonemic awareness, rhyming and alliteration awareness) of the participants.

Strongly Agree Somewhat Agree No Opinion Somewhat Disagree Strongly Disagree

2. Explicit Instruction is something you could see yourself implementing in the classroom.

Strongly Agree Somewhat Agree No Opinion Somewhat Disagree Strongly Disagree

3. Your participants seemed to enjoy participating in the study.

Strongly Disagree Somewhat Disagree No Opinion Somewhat Agree Strongly Agree

4. The computer format of the GGG is something that you could see yourself using to assess all of your participants.

Strongly Agree Somewhat Agree No Opinion Somewhat Disagree Strongly Disagree

5. Explicit instruction would be hard to implement.

Strongly Disagree Somewhat Disagree No Opinion Somewhat Agree Strongly Agree

6. Phonemic Awareness, rhyme awareness and awareness of alliteration are important skills for participants to know prior to entrance into kindergarten.

Strongly Disagree Somewhat Disagree No Opinion Somewhat Agree Strongly Agree

7. Teaching preschool participants using explicit instruction would be easy to implement.

Strongly Agree Somewhat Agree No Opinion Somewhat Disagree Strongly Disagree

8. Please state in your own words if you have seen any of the participants displaying any behavior that would correspond with an increase in phonological awareness skills. If you have not seen anything, please indicate that below as well.

Appendix O

Second Observer Data Sheet

Treatment Integrity Checklist-Baseline

Baseline Condition Materials

☐ Get it, Got it, Go Assessment Tool

☐ Stopwatch

☐ Recording Sheet

Instructions:
(1) Indicate whether the implementer performs each of the following steps by checking the appropriate box.
(2) Write comments, observations, or suggestions for improvement in the space provided.

Step	**Yes**	**No**	**Comments**
Sets out appropriate materials			
Pulls each participant individually out of the classroom			
Follows IV Checklist for Test Administration			
Models the skill, provides practice before individually assessing participant on skill			
Use manipulatives (e.g., alphabet letters, picture cards) as outlined for each phase			
Provides immediate feedback/error-correction (Example: says "Good" for correct responses, and provides correct response for incorrect responses)			
Distributes game pieces when appropriate			
Shows participant graph and marks current progress			
Exchanges game pieces for sticker			

Treatment Integrity = $\frac{\text{Number of steps completed}}{\text{Total number of steps}}$ X 100 = _____

Treatment Integrity Checklist-Independent Variable

☐ Get it, Got it, Go Assessment Tool

☐ Game Tokens

☐ IV Checklist

☐ Stopwatch

☐ Data Sheet

Instructions:
(1) Indicate whether the implementer performs each of the following steps by checking the appropriate box.
(2) Write comments, observations, or suggestions for improvement in the space provided.

Step	**Yes**	**No**	**Comments**
Sets out appropriate materials			
Pulls each participant individually out of the classroom			
Follows IV Checklist for Test Administration			
Models the skill, provides practice before individually assessing participant on skill			
Use manipulatives (e.g., alphabet letters, picture cards) as outlined for each phase			
Provides immediate feedback/error-correction (Example: says "Good" for correct responses, and provides correct response for incorrect responses)			
Distributes game pieces when appropriate			
Shows participant graph and marks current progress			
Exchanges game pieces for sticker			

Treatment Integrity = $\frac{\text{Number of steps completed}}{\text{Total number of steps}}$ X 100 = _____