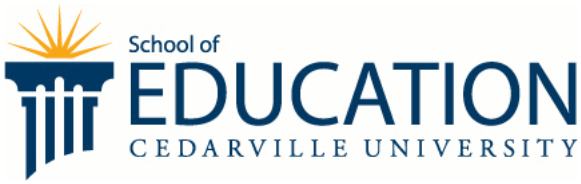

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Using Mnemonic Strategies to Teach Letter-Name and Letter-Sound Correspondences

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USING MNEMONIC STRATEGIES TO TEACH LETTER-NAME AND LETTER-SOUND CORRESPONDENCES

A project submitted in partial fulfillment
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Masters of Education

By

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I HEREBY RECOMMEND THAT THE PROJECT PREPARED UNDER MY SUPERVISION BY Janet Sue Shaeffer ENTITLED Using Mnemonic Strategies to Teach Letter-Name and Letter-Sound Correspondences BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Education.

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ABSTRACT

Shaeffer, Janet Sue. M.Ed., Education Department, Cedarville University, 2011. Using Mnemonic Strategies to Teach Letter-Name and Letter-Sound Associations.

The critical role of acquiring alphabet letter names and sounds as a foundation to literacy is pursued successfully with a class of kindergarteners, using two mnemonic treatments, one using pictures and jingles, and the other using music with a kinesthetic element.

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ACKNOWLEDGEMENTS

My deepest gratitude is to God, to whom I am forever grateful, for His salvation and ever present help. Psalm 40:3 (New American Standard Version) And He put a new song in my mouth, a song of praise to our God; Many will see and fear, and will trust in the Lord. Psalm 19:14 Let the words of my mouth and the meditation of my heart be acceptable in Thy sight, O Lord, my rock and my redeemer.

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DEDICATION

To my grandchildren, Annika, Emma, Levi, Reid, Claire, Kate, Weston, Ransom, and Yiriyah, thank you for the joy you bring, and for inspiring me to find new ways to help you learn. I pray that you will each know and follow Christ, and that His Word will be the light for your path, the rock on which you build, and the treasure you seek. May reading open the doors for all He has planned for you.

CHAPTER I: INTRODUCTION

Introduction to the Investigation

Even a casual observer of a kindergarten or first grade class would expect to see and hear the alphabet. Much more however, than the singing of twenty-six letter names by these jubilant little ones, is necessary to truly know the ABCs. Though the terminology, alphabetic principle, would be foreign to a youngster beginning to learn to read, yet the fact that letters in written words represent spoken sounds in a predictable way, is in fact the basis for their being able to learn to read (Berg & Stegelman, 2003; Bursuck, Munk, Nelson, & Curran, 2002; Foorman, Fletcher, Francis, Mehta, & Schatschneider, 1998). The continuum of skills based on recalling and using alphabet letters and sounds in attaining literacy is not as easy as it might seem. From a child's typical first accomplishment of singing or reciting the alphabet, to recognizing both upper case and lower case individual letters separately and as related to one another, to naming these symbols, to associating and remembering the sometimes multiple sounds they make when reading, to application of them in fluent word reading and comprehension, the task is not an easy one. Furthermore, acquiring this knowledge does not happen naturally, as acquiring spoken language does. Alphabet knowledge has been found to be one of the strongest predictors of future reading success in young children (Cardoso-Martins, & Pennington, 2004; Holopainen, Ahonen, & Lyytinen, 2001; McBride-Chang, 1999; Smith, Scott, Roberts, & Locke, 2008), and a best predictor of later word reading ability

(Schatschneider, Francis, Carlson, Fletcher, & Foorman, 2004). Adams (1990) found that "there exists a wealth of evidence indicating that the speed and accuracy shown by young readers in recognizing individual letters is a critical determinant of their reading proficiency and future growth" (p. 112). Failure to acquire this knowledge is an indicator for later reading difficulties (Piasta & Wagner, 2010; Holopainen, et al., 2001).

There is much at stake if for some reason a child has difficulty in learning to read. Berg and Stegelman (2003) expressed that "no single skill taught in schools is more central to learning than reading. Reading is the major route to content; and, without accurate and fluent reading skills access to literature, mathematics, science, history, the arts, and the rich vocabulary and concepts contained within text is diminished" (p. 47). Success in early reading is the most important predictor of success throughout school, and thus of life beyond school (Slavin, 1998). Adams (1990) quotes from Becoming a Nation of Readers,

> Reading is important for the society as well as the individual. Economics research has established that schooling is an investment that forms human capital-that is, knowledge, skill, and problem-solving ability that have enduring value. While a country receives a good return on investment in education at all levels from nursery school and kindergarten through college, the research reveals that the returns are highest from the early years of schooling when children are first learning to read. The Commission on Excellence warned of the risk for America from shortcomings in secondary education. Yet the early years set the stage for later learning. Without the ability to read, excellence in high school and beyond is unattainable. (p. 27)

Thus, while the necessity for making sure children learn to read is crucial, the timing is also crucial. Juel (1988), in her longitudinal study, reported that "the probability that a child would remain a poor reader at the end of fourth grade, if the child was a poor reader at the end of first grade was .88; the probability that a child would become a poor reader in fourth grade if he or she had at least average reading skills in first grade was .12" (p.440). She strongly emphasized that educators must make certain that children learn to decode in first grade or the avenue of all that is fostered by wide reading would be lost. Cunningham and Stanovich (1997) found that getting off to a fast start in reading, contributed to the likelihood of engaging in more reading activity, and predicted a likely lifetime habit of reading with the benefits thereof. Stanovich's (1986) earlier findings showed, that on the other hand, if reading skills are not acquired early on, so-called "Matthew effects" in academic achievement occur (p. 934). That is, poor reading, with its continued implications, precludes a child from developing in many areas related to reading, ever widening the gap between good and poor readers. Furthermore, Allington (1984), & Biemiller (1977-1978) suggest that the problem stems from difficulty in early experience in breaking the spelling-to-sound code, leading to reduced exposure to print. Subsequently, having deficient decoding skills and materials too difficult, a child's reading experiences become unrewarding and therefore to be avoided. This results in his additional lack of exposure and practice so that automaticity and speed in word recognition is delayed or compromised (as cited in Cunningham & Stanovich, 1997, p. 934).

Motivation or lack thereof can also be explained in terms of the attribution theory. According to Pressley (2006), "effort, ability, task difficulty, and luck" are perceived as

reasons for educational success or failure (p. 293). Nichol's studies (1978, 1990) explained that kindergarten and first grade students do not differentiate between effort and ability. They believe that effort exhibited, even in spite of failure, reflects high ability because, from their perspective, trying hard equals success. By the end of elementary school however, students attribute success or failure in terms of ability more than effort, so that when faced with failure despite personal effort, they conclude that they lack ability, and their motivation to expend the effort to learn to read plunges (as cited in Pressley, 2006, p. 293-4). Pressley further expresses that not intervening when children experience early reading difficulties sets them up for further failure and diminishing self-esteem. Therefore, it is imperative that curricular and instructional practices provide solid foundational skills, inspire motivation and success, and facilitate giving children the best opportunity for early and lasting literacy accomplishment. As Stein, Johnson, & Gutlohn (1999) put it, "the long-term effects of poor decoding instruction and lack of applied practice are potentially devastating to students and difficult for the best teachers to reverse" (p. 286).

The 1998 National Research Council stated that" the first line of defense against reading failure must be quality classroom instruction in kindergarten and the primary grades" (Mathes & Torgesen, 1998, p. 325). Foorman and Torgesen (2001) reported findings from the "best practices" meta-analysis by the National Reading Panel (2000) regarding alphabetics (phonemic awareness and phonics) which included the finding that phonemic awareness instruction which led to improvements in reading, was most effective when alphabetic letters were included and when conducted in small groups. Additionally, it was found that systematic phonics instruction produced significant

benefits with the strongest impact shown in kindergarten and first grade, and when integrated with phonemic awareness, fluency and comprehension (Foorman & Torgesen, p. 204). Schatschneider, et al., (2004) found that kindergarten measurements of phonological awareness, rapid automatized letter naming, and letter sound knowledge were the most predictive variables for first and second grade reading skills including, word identification, reading fluency, and passage comprehension. The importance and interrelationship of alphabetic knowledge and phonemic awareness have been explored and acknowledged repeatedly in research. Making the connections between phonemes heard in speech, and letters seen in print is imperative. Adams (1990) pointed out that there must first be a solid familiarity with individual letters, or instruction on letter sounds cannot be anchored. She found that it just as critically depends on the awareness of phonemes, the little sounds paired with letters which represent the sub-sounds of words (p. 255). Downing's (1979) review of Great Britain's success using the initial teaching alphabet (i/t/a) was used as an example to help reiterate that the value of presenting consistent grapheme/phoneme pairings serves the purpose of helping students understand the fundamental nature of the alphabetic system, which together with the approach that what one learns is meant to be understood, provides a foundation for literacy acquisition (as cited in Adams, p. 255-256). The importance of spelling-sound relationships is more than an illusion. It is based on "program comparisons, research on pre-reader skills, the knowledge and performance of skilled readers, theory on the nature of learning-each has pointed toward the conclusion that skillful word reading depends critically on the deep and thorough acquisition of these relationships" (Adams, p. 291). Chew (1997) reverberated this finding expressing that "a teaching method which does not

draw attention to the separability of either written units or speech units may delay both alphabetic and phonemic awareness" (p. 178).

While there is little disagreement that mastery of the alphabetic principle is one of the essential ingredients for reading success, there still remains disagreement as to how it should be accomplished instructionally, including questions about how direct the instruction, what kinds of text support it, and how best to integrate the rest of language arts (Foorman & Torgesen, 2001, p. 205). The acquisition of thorough letter knowledge is a timely and critical component (Holopainen, et al., 2001; Mathes & Torgesen, 1998). Schatschneider et al., (2004) pointed out that this has been true as far back as Smith's 1928 study, although he admitted that the differential predictive utility between knowledge of letter names and that of letter sounds across kindergarten "remains an empirical question" (p. 266). There is no question however, that many findings have indicated the value and necessity of direct instruction in both letter name and sound correspondences as foundational to literacy (Foorman et al., 1998; Hatcher, Hulme, & Ellis, 1994). One method shown to have had a positive effect in establishing letter name and sound correspondences for young children has been mnemonics (Ehri, Deffner, & Wilce, 1984; Fulk, Loman, & Belfiore, 1997; Agramonte, & Belfiore, 2002; Sener & Belfiore, 2005). Mnemonics is an instructional or learning strategy designed specifically to improve memory, by linking unknown information to something already known in a strategic way that aids in recall (Scruggs & Mastropieri, 2002, p. 2). Given the crucial significance of memorably instilling knowledge and use of basic components of the alphabetic principle in early literacy acquisition, while taking advantage of the learning

eagerness personified by many five and six year olds, the opportunity to apply these research findings was launched in the study at hand.

Purpose and Scope of the Study

In order to facilitate and accelerate foundational knowledge of alphabet letters and their phonetic sounds by students in a kindergarten class, a double mnemonic treatment was proposed. This treatment was to involve the use of pictorial alphabetic cards combined with spoken coordinating jingles, for the purpose of creating a memorable long-term association between the individual alphabet letters, their typical sounds, and a familiar object or action. This presentation and practice would take place weekly to bi-weekly in small groups of five or fewer students. The presentations would be made using twenty-six professional quality Open Court Alphabet Sound Cards which included upper and lowercase alphabet letters and a picture (Bereiter et al., 2004). Twelve of the pictures would be modified to better correlate with the current classroom curriculum, and the mnemonic link being emphasized. Correspondingly, modified jingles, serving to enhance the picture concept presented on the cards, would consist of short rhythmic phrases emphasizing the letter sounds in an alliterative format. It was hypothesized that by combining individual letters, associated pictures, and verbalized jingles to form strategic mental links, and rehearsing them regularly, significant, rapid improvement would be made in letter-sound knowledge. An additional treatment, using music as a mnemonic strategy, would also be applied. The songs to be sung would have original lyrics set to familiar tunes. Each song would include a kinesthetic action to depict the letter's shape (either uppercase, lowercase or both) and would include a connection to an experience or concept that the children could identify with, and relate

the letter and sound associations to. Each would also include some alliteration to emphasize the letter's sound, and in most cases mention the letter's name. It was hypothesized that by making these associations within familiar melodies, additional strategic encoding and recall of letter names, sounds and concepts would occur, and again rapid improvement in letter name and sound knowledge would be attained. The songs would be taught to the class as a whole during language group time. They would coincide with the curricular letter of the week and be taught at the rate of one song per week. They would be sung twice daily during the week of presentation, and approximately bi-weekly thereafter. The research study was to last for about ten weeks early in the school year. Administrative and parental permission to proceed with the treatment with all of the students in the class was sought and granted.

Significance of the Study

The significance of the study was anticipated to be to contribute to research based, best practice findings regarding how to help children quickly learn essential alphabetic letter names and their corresponding sounds, and to present a usable teacher- and student-friendly strategy and format for doing so. If the data reflected both immediate and long-term increased knowledge of alphabet letter names and sounds, indicating the effectiveness of the mnemonic treatments, future application could be encouraged for this step of literacy acquisition. Significant to the students receiving the treatment would be the benefits of gaining alphabet knowledge quickly and early as a basis for reading. It was anticipated that because all of the alphabet letters with their sounds (limited to short vowel and hard consonant sounds) would be introduced and rehearsed in a strategic way early in the year, a significant number of the letters could be mastered, before such

mastery was required by the letter of the week curriculum. The songs would further help to encode the letter knowledge in each student's long term memory, adding strength to the connections with their musical and kinesthetic properties. This enhanced grasp of the alphabetic principle would be one step in establishing a foundation for continued progress in reading skills, applied to actual reading throughout the remainder of the school year and beyond. A part of the school's mission of "partnering with responsible Christian families and their churches in educating their children to become like Christ and preparing them to fulfill God's purpose for their lives" would also be fulfilled as steps toward crucial literacy and the avenue of personal biblical literacy opened up for them (Dayton Christian Schools, 2009). The study results could influence ongoing teaching practices, and contribute to future curricular choices.

Methods of Procedure in Setting Up the Study

One of the mnemonic treatments, using the pictorial alphabet cards and jingles, was to be applied within small groups of students. Mathes & Torgesen (1998) have expressed that an application of increased intensity of instruction might be accomplished by "increasing instructional time or reducing the size of instructional groups" (p. 326). Elbaum, Vaughn, Hughes, & Moody (1999) have stated that meta-analyses also have consistently shown positive effects within grouping practices that increase instructional intensity (as cited in Foorman & Torgesen, 2001, p. 209). By choosing to apply such a setting for this study, the format for scaffolding and differentiating instruction of students at different levels of literacy acquisition would be put in place. In order to make such small group sessions possible, establishment of learning centers was initiated. By using learning centers, a means would be provided to engage all of the students meaningfully,

use instructional time wisely, and provide the setting for the teacher guided small group to occur. This format would also expedite developmentally appropriate student movement, hands-on activities, and application of skills purported by state and institution standards. The learning centers would be planned by the teacher, and then be primarily student regulated, with the exception of the small group that would meet with the teacher daily. In this group, the portion of the mnemonic treatment utilizing the alphabet cards and jingles would be applied, and letter writing practice would be undertaken. Writing is said to help solidify letter knowledge because it requires thought about the distinct visual image, consolidates the child's knowledge of the letter's form, and likely provides an "articulatory loop" wherein voicing the letter sound or name while printing contributes to binding the visual, motor, and phonological images of the letter simultaneously (Adams, 1990, p. 355).

Following this time of center activities, a second block of small group activities would occur, allowing for another small group to meet with the teacher daily. At this secondary time, the other students would be allowed to choose from various divergent play activities. Play has been shown to promote problem solving, develop creativity, build attention spans, and encourage social development (Hirsh-Pasek, Golinkoff, & Eyer, 2004, p. 206). In addition, play provides the concrete experience necessary to symbolic representation which is found more abstractly in language when a letter represents a sound (Hirsch-Pasek et al., p. 227). McCune's (1995) study on representational play found that symbolic play and language production are functions of a person's capacity for mental representation that emerge in the context of a system of related skills (p. 204). Although this representational play awareness typically develops

at a younger age, its prevalence in later stages serves to reiterate this concept and provides a reinforcing role in language development as children manipulate objects as symbols for other things, facilitating symbol manipulation as it is used in language (Hirsh-Pasek et al., p. 209).

In addition to the center based learning, a whole group language teaching time would occur. Teaching, singing and activities to promote letter knowledge and phonemic awareness would be prevalent in this setting where the alphabet letters would be presented in a letter of the week format following the school's current curriculum. Both the uppercase and lowercase letter representations with their corresponding sounds would be presented, related quality children's literature would be read daily, and high frequency sight words would be presented and practiced. It would also be in this context that the songs would be taught, purposefully connecting the letter, with its name, sound, shape, and the mnemonic concept being emphasized. Students would participate in both the singing and motions. The songs would continue to be sung approximately bi-weekly throughout the treatment.

Biblical Integrative Component and Implications

The Bible is God's revelation to man. In it God unfolds knowledge of Himself and His purposes through what He has made (Genesis 1, Romans 1, Psalm 19), through what He has said (Psalm 119, John 5:39), through His incarnate Son, Jesus (John 1, John 20:31, Hebrews 1), and through the biblically recorded history of his workings with mankind (Romans 16:26-27, I Corinthians 10:11). Order, design and purpose are evident beginning with the earliest biblical revelation given in the Genesis creation account. This can be seen in such features as day and night; land and seas; days and seasons; classes of

reproducing plants, fish, birds, animals; and uniquely in His creation of and workings with mankind. Man's nature, responsibilities and rational thought are apparent from this account. One of Adam's early tasks, to observe the animals and birds and name them accordingly (Genesis 2:19 – 20), reflected his linguistic and reasoning abilities. Although those capacities were tainted by his subsequent sin, God continued to communicate and work with mankind, preserving a written record of His dealings with them. This written record, the Bible, precludes the expectation, and self-expressed priority, that men should read and learn from it. Indeed the Scriptures indicate that this written record is of inestimable value and eternal duration (Psalm 119, Isaiah 40:8, 55:11). Since God has primarily provided a written, readable communication as a basis to acquire specific knowledge, it follows that using this means and source should also be of great value to those pursuing God's ways. Within the Bible, God has masterfully demonstrated various forms of effective and memorable communication with man including strategic use of spoken words, written words, visual depictions, typology, metaphors, symbolism, lists, songs, repetition, episodic occurrences, object lessons, storytelling, proverbs, prose, and parables. God often used both very striking and very ordinary associations to bring clarity or enhance long term recall.

Some examples of extraordinary remembrances include: His exhibiting the rainbow, a memorable symbol of His first covenant with man following the devastating judgment of the world-wide flood; the song of Moses, rehearsing and recalling God's miraculous and providential deliverance of the Israelites from Egypt; the tabernacle, depicting and foreshadowing the God's pattern of atonement; the church, depicted as the bride of Christ; and the bread and the cup, used by Jesus to represent his soon to be

broken body and shed blood for man's redemption. This final correlation was modeled with definitive instruction that repetition of this symbolic act would fulfill the purpose of bringing to remembrance Jesus' redemptive work on man's behalf.

Some biblical examples using very familiar items or experiences include references to wind, water, fire, rocks, coins, as well as agrarian, athletic, familial, building, and military themes to represent and aid understanding of deeper truths. In many memorable ways God has portrayed what He wants people to know, remember, and respond to.

Christians, as God's image bearers and stewards (Genesis 1-2), despite being flawed by sin, continue to be entrusted with learning, exemplifying and then teaching others to know and remember God's word, works and ways. Christian teachers assist parents in their role of teaching their children and verifying God's Word to them (Deuteronomy 6:1, Proverbs 22:6, & Psalm 78). Additionally, in obedience to the Scriptural mandate calling for doing good toward all men, (Galatians 6:10, Titus 2:7), the good of promoting literacy can be pursued. Since early colonial times in American history, wherein actively pursuing literacy served to enable biblical literacy with all its benefits, such a motivation has been expressed. In our current society, children are those most often in need of being taught to read. By using teaching methods that reflect God given order, reason, and creativity, the goal of bringing understanding and useful application of literacy from the whole, meaningful reading, by assimilating its component parts, may be accomplished. As applied to the current study, one component of the over-arching skill of learning to read, the foundational acquisition of letter names and sounds,

would be presented in a way that would be manageable, meaningful and memorable, and in a context wherein God's Word, works, and ways might be acknowledged.

Definitions

Alphabetic principle – a predictable relationship between the sounds of language and the letters used to represent those sounds (Berg & Stegelman, 2003, p. 47)

Decoding – application of letter-sound correspondences taught in phonics to deciphering printed words (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998, p. 38)

Differentiation – a strategy a teacher uses to access student needs, and then determine and apply appropriate methods to address the needs

Explicit phonics – instruction in which the sounds associated with the letters are identified in isolation and then blended together to form words, predominant word identification strategy is phonologically based (e.g. sounded out with knowledge of letter-sound correspondences) (Stein, Johnson, Gutlohn, 1999, p. 276)

Implicit phonics – instruction in which students are asked to identify the sounds associated with individual letters in the context of whole words rather than in isolation, predominant word identification strategies include using context and picture cues to read unfamiliar words in text (Stein, Johnson, Gutlohn, 1999, p. 276)

Phonemic awareness – a sensitivity to sounds in language at the phoneme or syllable level, also can refer to the various manipulations of these sounds as in deletion, substitution, segmentation, blending, or rhyming. (Smith, Scott, Roberts & Locke, 2008, p. 113)

Scaffolded instruction – teacher-to-student interactions such that the child is supported in accomplishing a task which he could not otherwise do by himself (Stone, 1989 cited in Foorman & Torgesen, 2001, p. 209)

Meta-analysis – a statistical procedure that synthesizes the data from a number of existing studies to determine important programmatic effects (Camilli, & Wolfe, 2004, p. 26)

Mnemonics – instructional or learning strategies designed specifically to improve memory, often by modifying to-be-learned information to link it directly to information the learner already knows (Scruggs, & Mastropieri, 2002, p. 2)

CHAPTER II: LITERATURE REVIEW

Phonological Skills

Given the importance of reading, the enormous amount of research, and the years of experience on which to draw, it would seem that there would be clarity in regard to how to best approach literacy acquisition. Historically, however, issues have been heated enough to be referred to as "reading wars" (Scholes, 1998, p. 178) and "The Great Debate," (Chall, 1983, as cited in Foorman, et al., 1998, p. 38). Gwynne-Austin (1997) expressed that "What on the surface may seem to be relatively simple question of how best to acquaint children with sound-symbol relations (phonics) has in fact been a continuing, emotional, and for the most part unresolved issue" (as cited in Robinson, Baker, & Clegg, 1998, p. 18). This range of viewpoints can be attributed in part to the historical progression of thought regarding literacy, and the means used to determine reading strategy effectiveness. Foorman and Torgesen (2001) noted the decade by decade shift in criteria used to indicate classroom reading effectiveness, from "main effects" of reading methods on achievement in the 60s & 70s, to "effective schools research" focusing on process-product relationships in the 80s, to the "best practices" of the mid-80s to 90s, to more recent "evidence-based research" (p. 203). Their investigation concluded that critical components of instruction are the same whether for prevention or intervention of reading failure, though the approach may be more explicit, comprehensive, intensive, and supportive for the latter. Reading programs were found to be most effective when they included "phonemic awareness, phonemic decoding skill

fluency in word recognition and text processing, construction of meaning, vocabulary, spelling and writing" (p. 203).

Schatschneider et al., (2004) undertook research to attempt to resolve the discrepancies of past findings that "sixty years of research have not resolved the questions of what constructs assessed in kindergarten best predict subsequent reading outcomes" (p. 265). They explained that in the past even the variables that predicted reading skills were influenced, depending on the theory of reading held by those developing the screening mechanism and measures to be evaluated. Darlington (1968), said regarding contributions of individual variables in educational research that "it is well established that investigating the importance of a predictor is always relative to the overall subset of variables being investigated" (as cited in Schatschneider, p. 280). They concluded:

> The major reasons that these issues have not been resolved is that the theories that motivate consideration of what variables are most predictive of reading outcomes change over time, reflecting the evolution of reading research (Gaffney & Anderson, 2000). Thus, in the early 1970s, many studies were motivated by hypotheses that involved visual perceptual factors in reading (e.g., Gibson & Levin, 1975). Against this backdrop of interest in perceptual factors was even older literature dating back to Smith's (1928) study indicating that measures involving alphabet recitation, naming, and sounds were good predictors of reading outcomes. Finally, also against the backdrop of interest in perceptual factors, was the emergence of the phonological awareness hypothesis in the early 1970s and its preeminent status in explanations of beginning reading skills. (p. 279)

Noting the disparate findings and research void combining these issues in a single study, they extracted six hypotheses from these sixty years of findings, seeking to more clearly determine predictors of reading outcomes. Their particular statistical approach, dominance analysis, was said to allow for better assessment of unique and important contributions of differing variables to reading outcomes, which they applied to identifying cognitive predictors of kindergarten early reading performance as related to first grade reading achievement. Their well-documented findings indicate that "the unique variance across different outcomes was consistently accounted for largely by three variables: phonological awareness, knowledge of letter sounds, and RAN (rapid automatized naming) letters" (Schatschneider et al., 2004, p. 279). Knowledge of letter names was also a significant predictor near the beginning of kindergarten, but became less useful later due to ceiling effect. They concluded that "had phonological awareness and rapid naming measures been available in these early studies, it does not seem likely that perceptual measures would have emerged as strong and unique predictors" (Schatschneider et al., p. 280).

Additional evidences that indicate the correlation and foundational necessity of these skills to reading success are plentiful. In Chall's (1967, 1983) classic work, on examining every study she could find correlating letter or phonic knowledge and reading achievement, a strong positive correlation surfaced in every one. She stated that for pre-readers and young readers, "familiarity with letters and sensitivity to the phonetic structure of oral language were strong predictors of reading achievement-stronger, in fact, than IQ" (as cited in Adams, 1990, p. 39). Juel (1988) describes the relationship stating:

> Decoding is the process that leads to word recognition. Learning to break the code of written text is partly dependent on being aware that words are composed of sequences of meaningless and somewhat distinct sounds (i.e., phonemes). This is often referred to as phonemic awareness. This realization is not necessary for understanding or producing speech. In speech production there is no clear distinction between phonemes, because one phoneme overlaps another. But phonemic awareness is necessary in learning to decode an alphabetic language, as print decoding depends on mapping phonemes to graphemes (i.e., letters in English). In school, phonics instruction attempts to make these correspondences explicit. (p. 437)

Adams (1990) says that prior to one's appreciation of the alphabetic principle, one needs the ability to attend to the sound, as opposed to the meaning, of speech. This attending to the sounds of speech phonologically happens in various ways and at various levels. Scholes (1998) describes phonological awareness as made up of two very different abilities, the ability to isolate and sound out speech segments at the syllabic level, called syllabic awareness, and the ability to isolate and manipulate sub-syllabic segmental phones at the phoneme level, called phonemic awareness (p. 180). Pressley (2006) states that "many kindergarten and grade-1 children lack the awareness that words are streams of sounds that can be disentangled, and that sounds can be assembled to produce words. They lack phonemic awareness, a metalinguistic insight that seems to be essential in learning to read" (p. 116). Stanovich (1986, 1988) and Rozin, Poritzky, & Sotsky (1971) expressed that "the absence or lack of phonemic awareness appears to be characteristic of children who are failing, or have failed to learn to read" (as cited in

Adams, 1990, p. 328). Holopainen, et al., (2001) concluded that in their findings, "the lack of phonological awareness alone does not cause poor reading, but rather that poor reading manifests as a combination of factors including poor phonological awareness and letter knowledge, poor working memory, and low verbal intelligence" (p. 403). The presence or absence of this awareness seems indicative of ease of acquisition or of progress in reading sub-skills, with measures at each level reflecting differing correlations to reading acquisition. It has been shown that it can be taught effectively, particularly at beginning reading stages. Indeed, many experts and programs recommend promoting phonemic awareness activities in and around kindergarten age, since it is of measurable benefit, particularly for those with low phonemic awareness, who cannot extract it for themselves.

A progression depicting levels of awareness is described by Adams (1990). Young students must move from the propositional or idea unit, to be directed to the concept of words, with the help of exposure to print, to begin evidencing emergent reading behaviors. Following word awareness is an awareness of syllables. Syllables can be detected in speech sound variations, and once perceived, are fairly easy to attend to successfully. At the end of the spectrum, comes the even harder, yet vital, capacity to attend to individual phonemes. Each level of awareness is indicative of a student's progression in understanding.

> When degree of awareness of (or performance on a task that requires direct attention to) each of these units is compared with beginners' reading achievement, phonemic tasks produce the highest correlations by a wide margin. Syllabic tasks generally produce significant but weaker correlations. And the results with word

> tasks are only sometimes significant. Moreover, sophisticated statistical analyses indicate that performance on all such linguistic awareness tasks generally reflects a single pool of underlying ability rather than any independent lineup of unrelated skills. (p. 295)

Caution must be taken in interpretation and application of some studies purported claims due to a range of underlying issues. Schatschneider et al. (2004) states:

> In an examination of the construct validity of a battery of different measures of phonological awareness skills using item response theory, Schatsneider, Francis, Foorman, and Fletcher (1999) found that phononlogical awareness was essentially a unitary construct that varied on a continuum of complexity from preschool through at least the second grade. The simplest assessments involve initial sound comparison and rhyming, whereas the most complex assessments involve blending of multiple phonemes. Moreover, assessments at the beginning of kindergarten may be less reliable than assessments in the middle or end of kindergarten, reflecting the child's need to acclimate to the learning environment. Hence, whether phonological awareness skills are predictive may involve how and when such skills are assessed-relationships that are obscured when correlations are averaged across studies. (p. 266)

Furthermore, they indicated that in some cases validity may vary depending on the nature of the sample, the length of the follow-up interval, and the outcome domain. Cardoso-Martins & Pennington (2004) pointed out the "myriad of tasks" on the continuum that may be used to access phonological awareness, that "studies based on a single indicator should be subject to a considerable amount of measurement error" (p. 30) and that "tests

of phoneme awareness differ with regard to difficulty and discrimination power depending on the child's age and level of development" (p. 36). The phonemic sensitivity can also depend on the size of phonemic unit being considered (Smith, Scott, Roberts, & Locke, 2008, p. 114). Some statistical analyses are also more definitive than others. Adams (1990) observed that sophisticated statistical analyses can invite misinterpretation to the statistically uninitiated when they beg the conclusion that phonemic awareness is the single most important skill needed by pre-readers. She gives the example that although statistical correlations, such as that between letter naming accuracy and reading ability of college students, may be nil, yet "normal reading is strongly dependent on facile letter recognition" (p. 296). She indicates that the significance of each level of awareness should not be negated, but rather it should be recognized that stages of acquisition are being acquired by children with their current developmental stage being reflected. She concludes that:

> The relative magnitudes of the correlations between children's reading acquisition and their awareness of spoken phonemes, syllables, and words are consistent with the evidence that each is more difficult and attained later than the next. They are uninterpretable with respect to the relative importance of these skills to reading. In fact each is critically important." (p. 296)

There is also the issue of the reciprocal nature between phonological awareness and reading. Perfetti, Beck, Bell, & Hughes (1987) stated that "some phonemic abilities (such as phoneme blending) appear to be prerequisite to learning to read, whereas other abilities (such as phonemic deletion) may be outcomes of learning to read (as cited in Juel, 1988, p. 437). Torgesen, Wagner, & Rachotte, (1994) concur indicating, "the

relationship between reading acquisition and phonological awareness is often thought to be reciprocal because usually children do not attain full development of explicit phonological awareness until reading instruction begins" (as cited in Holopainen, et al., 2001, p. 402). Carsdoso-Martins and Pennington (2004) expressed that some of the tasks developed to assess phonemic awareness can only be solved only after beginning to read.

Regardless of the degree of significance issues between phonemic awareness and alphabetic knowledge, many studies have supported the efficacy of incorporating both. Hatcher et al., (1994) perceived a phonological linkage hypothesis, holding that to be effective in boosting reading skills, there must be integration in phonological and reading skills. This was demonstrated by their findings that students who received training in both letter-sound correspondences (alphabetic principle) and sound categorization skills (phonemic awareness) had substantial improvements in reading and spelling skills, compared with those receiving just sound categorization training. They concluded that "teaching both phonological and reading skills and their interrelationship is far more effective than working on either in isolation" (p. 54).

Smith et al., (2008) state:

> Letter knowledge and phonological awareness are key precursors to early decoding skills (e.g., Caravolas, Violin, & Hulme, 2005; Frost, Madsbjerg, Neidersoe, Olofsson, & Sorenson, 2005; Lonigan et al., 2000; Muter, Halme, Snowling, & Stevenson, 2004; Olofsson & Niedersoe, 1999; Wagner et al., 1997). Other tasks tapping phonological processing, such as rapid automatic naming (RAN), have also been shown to be highly predictive of later reading

outcomes, but to a somewhat lesser degree than phonological awareness and letter identification. (p. 113)

Chew also points out the distinctions, yet correlations, between the skills needed in phonemic awareness to hear and write words, in contrast to the skills needed to read words. She explains that "traditional phonics makes each phoneme visible by mapping it to a printed symbol," and that reading, within phonics, is not analyzing spoken words into phonemes without seeing print, but synthesizing separate phonemes into spoken words (p. 177).

Adams (1990) cites Bradley and Bryant (1983) well known for their study seeking to know if training in phonemic awareness would translate into advantage in reading comprehension scores (p. 77). Selecting children with a poor showing on a phonemic awareness oddity task, and then grouping them in treatments with and without letter-name instruction, they proceeded to find that the group receiving instruction on both letter names and sounds before instruction on sight words, was most successful. This led to the application that both letter knowledge and phonemic awareness are critical in beginning reading, and that there is some special "magic" in linking the two skills (Adams, 1990, p.78- 79). Holopainen, et al., (2001) also uniquely discovered such a connection when some of the Finnish children in one of their groups reported "seeing sounds like letters written in the air" and then proceeded to solve a sound blending task, seemingly revealing an advantage due to orthographic knowledge in relationship to phonemic awareness. They drew the conclusion that "letter knowledge helps children in all phonological tasks in a transparent language" (p. 410).

This developing relationship between letter knowledge and phonemic awareness can also be observed in children's writings. Recognizing that reading and writing are reciprocal skills, it is possible to observe and abstract children's levels of awareness, particularly in their invented spellings. In Treiman's (1994) development model, children's writings seemed to indicate stages of awareness and application, beginning with young children's reliance on a letter-name strategy for a time. Read (1975) noted preschoolers' writings evidenced their use of exact or similar sounding letter names to represent sounds in their writings (e.g., "fas" for face, and "kam" for came) and Gentry (1982) indicated "a letter name strategy is very much in evidence. . . Where possible the speller represents words, sounds, or syllables, with letters that match their letter names (e.g., "r" [are]; "u" [you]; "left" [elephant] (as cited in Treiman, 1994, p. 567). She suggested that this true, yet more likely was representative of the child's current ability in manipulating the phonological properties of the letters' names. She went on to interpret that the difficulty or ease a child finds in trying to segment the phonemic sounds as reflected in the errors or types of errors made, that letter-name effects (e.g., "r" used to represent "ar") reflected in misspellings were greater for some letters than others, and that the differences seemed to reflect the phonetic properties of the letter names, and the child's level of spelling development (p. 577). Interestingly, Treiman suggested three phases of letter name use in spelling development, that parallel the phonemic awareness levels shown in reading research: a preschool level sensitivity to syllables representing each syllable with one symbol; a medial increased phonological awareness stage, represented by imperfect spellings using phoneme-grapheme correspondences; and a final stage demonstrated by the ability to separate more difficult phonemes, symbolizing

each with a separate letter while also including more vowels (p. 577). Adams (1990) states that evidence is compelling that in pursuing the goal of efficient and effective reading instruction, explicit phonemic awareness training is invaluable, and that the path to phonemic awareness is stepwise, from words, to syllables and beyond. "No matter the child's level of phonemic awareness, to make use of it she or he must learn the visual identities of individual letters" (p. 333).

Letter Name, Letter Sound Impact on Literacy Acquisition

While children bring a range of phonemic awareness skills with them as they begin school, they also bring various levels of alphabetic skills. It is common for children to have a familiarity with the alphabet before they start kindergarten. This knowledge may come from parents, pre-school experiences, children's television, computer interactions, alphabet books, educational toys, and very commonly the familiar ABC song. Studies have found that children learn the names of most letters earlier than they learn their sounds (McBride-Chang, 1999; Tremain, Tincoff, & Richmond-Welty, 1996). Adams (1990) emphasizes the importance of letter name knowledge, as critical, providing a label and "mnemonic peg" on which to acquire, arouse, and add interconnected information (p. 359). She reports that teaching visual recognition with the help of names: is historically most common; pedagogically provides a convenient label for a concept to be learned; provides a powerful pedagogical means to bond and reinforce all experiences; and is beneficial because most letter names contain clues regarding their phonetic significance (p. 351-352). McBride-Chang found that while letter naming and letter sounding are sometimes treated as a unitary concept, representing overlapping skills, they can also be viewed as related, yet distinct skills, representing two different

abilities. The phonological properties of letter names appear to have a great impact in beginning literacy.

Mc-Bride-Chang (1999) examined the associations of letter-naming, and letter-sounding as related to each other, as associated with subsequent reading skills, and as influenced by the letters' linguistic features. She concluded that letter naming and letter-sounding are two different yet highly associated tasks. Letter naming, found to be a simpler task, was said to involve a type of mapping of a visual symbol to its word-like phonetic representation (e.g., b = /bi/). She suggested that this was a familiar task for children since they use words to name things. The step of associating letter symbols with their sounds was found to be more difficult. Her interpretation was that because it necessitated isolating a single phoneme, it was actually a phonemic awareness task, less familiar to children. This led to her assumption that letter sound knowledge, often derived from letter names, was likely more closely associated with reading skills than letter naming. Regarding letter names and sounds, she found that children in her study knew more letter names than letter sounds, and that they learned letters and sounds from the beginning of the alphabet sooner than those from the end. She also documented differences in ease of learning letter sounds based on the linguistic features represented in letter names. Those with consonant-vowel sounds (e.g., b= /bi/) were consistently easiest, vowel-consonant sounds were of intermediate difficulty (e.g., l=/el/), and those whose sound was not extractable from the name (e.g., y) were found to be most difficult. This strongly demonstrated influence was attributed to the position of the letter sounds within letter names, and the seeming tendency for children to attend to initial sounds

most closely. Both letter naming and letter sounding knowledge contributed unique variance to various reading skills, letter sounding more so at later testing times.

Her study with multiple statistical analyses, helped highlight some additional relationships between letter-naming and letter-sounding. One such finding was the differences in cognitive requirements between the two tasks. Between the two skills, letter naming contributed to letter sounding, but not vice versa. Both, however, predicted future letter-sound knowledge, emphasizing the importance of teaching letter names as well as their sounds. More evidence of the phonological awareness connection, as shown by her correlation analyses with invented spelling and word decoding, was also found. This reiterated the hypothesis that letter-sound knowledge replicates phonological tasks in predicting reading related skills.

Another study exploring the influence of letter name properties and child characteristics was done by Piasta and Wagner (2010). They too focused on how letter name structure, the way the letter sounds are represented within letter names, influenced letter sound knowledge in young children. Using three conditions, combined letter name and sound instruction, letter sound only instruction, and a control treatment of number identification, they tested children's gains in alphabet knowledge based on letter name properties. To avoid the bias due to alphabetical order, they used a random sequence to present the letters. Similar to McBride-Chang's format, letters were grouped into the categories according to how the letter sounds are contained within the letter names. These categories were consonant vowel (CV), following the pattern of /consonant sound/ + /i/ (B,D,J,K,P,T,V,Z), vowel consonant (VC), following the pattern of /e/+/consonant sound/ (F,L,M,N,R,S,X) , no association (NA) letters (C,G,H,Q,W,Y) and all the vowels

(A,E,I,O,U). The two treatment conditions differed only by whether letter names were taught with letter sounds or not. Their carefully controlled and analyzed data indicated that letter name structure had little effect on the learning of letter names. However, when receiving combined letter name and sound instruction, accelerated letter sound learning of CV and VC letters occurred, and furthermore combined, explicit instruction overrode phonological processing limitations. Other results indicated that combined letter name and sound teaching yielded neither CV nor VC knowledge advantage, but both were learned to a greater extent than the NA letters (Piasta & Wagner, 2010, p. 337). For the children in the control group who were taught letter names without explicit instruction in letter sounds, results were divided with regard to phonological ability. Children with lower phonological processing abilities showed very low probabilities of learning the sounds of any letters. Children with higher phonological processing abilities were more likely to learn sounds of CV and vowel letters, a finding consistent with letter name structure effect. Vowel sounds appeared to be more likely to be learned without explicit instruction, but this finding was subsequently attributed to the initial position and familiarity with the vowel "A." They concluded "that in the absence of explicit letter sound instruction, only those children with higher phonological abilities are capable of segmenting the initial sounds from CV letter names, and using these as cues to letter sounds" (p. 338). Extraction of the sound cue from VC letter names was beyond the children's abilities without explicit instruction or more advanced phonological skills.

Children's results from the letter sound only treatment group showed no advantage for any group of letters once phonological processing skills were accounted for. However, because they had no letter names to use as cues, the letter name-to-sound

facilitation effect may have been inadvertently supported. This group also ended the study with significantly lower letter name knowledge than those who received both letter name and letter sound instruction. Significant to this finding was that the gains within the letter name and sound group were "directly attributed to the instruction given" (Piasta & Wagner, 2010, p. 339). This led to the conclusion that letter name training coupled with letter sound instruction positively impacts students' letter sound knowledge, even to the extent of overriding phonological processing. Additionally, their results implied the critical importance of alphabetical instruction for children at reading risk due to phonological deficits who are unable to extract the letter sound information by themselves.

Many researchers have shown the importance of knowledge of individual letter sounds applied to word recognition skills. Chew (1997) defended traditional phonics with its central tenet, that beginners in alphabetic writing systems "can be taught to read simple words by applying letter-sound correspondences from beginning to end of each word" (p. 173), and showing evidence of a Schonell Graded Word Reading Test where traditional phonics students far outperformed the revised norms and the students in new phonics experiments (Chew, p. 179). She concluded that "phonics-first children" also tend to be "phonics-fast children," as reflected in their superior abilities to read regular and irregular words in a measured test situation (Chew, p. 182). Mathes and Torgesen (1998) state that two decades worth of extensive research has led to a strong consensus that for those with serious difficulties in learning to read, a fundamental problem lies in their "lack of acquiring accurate, fluent word identification skill" inhibiting comprehension development, and that "systematic instruction in word recognition" is

most crucial of the critical components for at risk readers (p. 321). Stein, Johnson & Gutlohn (1999) also established a very strong relationship between explicit phonics instruction and decodable text in reading instruction. Such instruction explicitly teaches letter sounds in isolation, and then makes application of that knowledge to teach blending of sounds to read unfamiliar words. This stands in contrast to implicit phonics instruction wherein students are asked to identify letter sounds in the context of whole words, and includes strategies of using context and picture cues to determine unfamiliar words. Beck and Juel (1995) observed that using context to teach letter-sound correspondences is implicated in student failure to learn the correspondences "because they are unable to segment words into their individual sounds" (as cited in Stein et al., 1990, p. 276). This approach is also problematic because it consumes a great deal of cognitive capacity. Share & Stanovich (1995) stated that the ability to read words, when no semantic context clues are present is "a defining characteristic of the good reader" (as cited in Pressley 2006, p. 50). Pressley further emphasizes that it is important to process every single letter during reading because letter–level clues are the primary means of recognizing words, and that "sounding out is something good readers do well" (p. 51).

In a study done by Foorman et al., (1998), significant results were obtained by students receiving direct (versus implicit) code instruction, resulting in normalizing distribution of reading scores so that even those students with beginning low word-level and phonemic awareness skills were able to become successful readers. They concluded that "children who were directly instructed in the alphabetic principle improved in word-reading skill at a significantly faster rate than children indirectly instructed in the alphabetic principle through exposure to literature" (p. 51). Foorman and Torgesen

(2001) point out that the more direct the instruction, the more controlled the text, noting that students' reading shows significant improvement "if letter-sound correspondences are taught explicitly and practiced in controlled-vocabulary text" (p. 205). They call for "direct, systematic, comprehensive instruction to build phonemic awareness and phonemic decoding skills," based on powerful evidence of intervention research (p. 208). Juel, Roper & Schneider, (1985) concluded that:

> "the selection of text used very early in first grade may, at least in part, determine the strategies and cues children learn to use, and persist using, in subsequent word identification. . . In particular, emphasis on a phonics method seems to make little sense if children are given initial texts to read where the words do not follow regular letter-sound correspondence generalizations. Results of the current study suggest that the types of words which appear in beginning reading texts may well exert a more powerful influence in shaping children's word identification strategies than the method of reading instruction. (as cited in Adams, 1990, p. 279-280)

Juel (1988) brings the issue back full circle in concluding that a primary factor that kept poor readers in her study from improving was their poor decoding skill. Since decoding is dependent on breaking the grapheme-phoneme code, and a deficiency of decoding ability leads to little reading, and thus little opportunity to gain vocabulary and knowledge, poor comprehension is perpetuated, and the "vicious cycle" continues (p. 445). Her recommendations included the necessity of remediating quickly with phonemic awareness training, making certain that decoding is learned in first grade, and taking great efforts to keep up motivation to read and development of listening

vocabulary by reading to students, while finding ways to promote extensive reading. Without dismissing the need for improvement of higher order comprehension skills of older students, she expressed that "the most straightforward way to achieve this goal may be to concentrate on the rapid and early attainment of lower level skills" (p. 446).

Mnemonics

Mnemonic instruction refers to instructional or learning strategies designed specifically to improve memory. Mnemonics are useful for improving initial learning and long term recall. Well known mnemonics developers Mastropieri & Scruggs (1991) explain that they provide a means of specifically helping both in the aspects of increased information recall, and in providing effective strategies which, when applied, help in retrieving the information (as cited in Sener & Belfiore, 2005, p. 106). Mastropieri and Scruggs have done extensive work with mnemonics and highlight their particular use in developing improved ways of taking in (encoding) information so that recall (retrieval) from memory is easier. A mnemonic strategy works to relate new information to information already established in long-term memory, the stronger the connection, the stronger the memory. By using this specialized link, often with both visual and verbal cues, the new and prior information are linked, greatly enhancing recall of the new information. Effects have been shown across many academic areas, and proven successful in helping those who have learning difficulties. Using mnemonics is helpful specifically where verbal content is required.

Mastropieri and Scruggs (1998) make it clear that these strategies are not indicative of a philosophy of education, nor an educational panacea, nor a comprehension strategy, but rather they are memory strategies found to be useful in making content

information easier to remember (p. 3). Some mnemonic strategies include the use of keywords, pegwords, acronyms, acrostics, and elaborations (Scruggs & Mastropieri, 2002, p. 2-8). Use of a keyword strategy involves choosing a familiar keyword that sounds like the new word or concept, and picturing it interacting with the connecting meaning or concept (e.g, picturing a woman putting on red rouge to remember the French word for red, rouge). Keyword mnemonics are useful for connecting vocabulary with meanings, and making connections concerning historical people (e.g., Abe Lincoln and Gettysburg Address), places (e.g., states and their capitals), or events (e.g., first Americans on the Moon and Apollo 11). Pegword mnemonics are useful in helping people remember numerically ordered information. This strategy uses rhyming proxies as a way to remember numbers (e.g., one is bun, two is shoe, etc.). The pegword is put in the picture along with a keyword and depiction of the term or concept to be linked (e.g., Exodus – the second book of the Bible, might be depicted as an exit sign, "exit" sounding similar to Exodus, with person wearing very large shoes, "shoe" being the pegword for two). Acronym and acrostic mnemonics can help with the recall of elements in lists of information. Acronyms are words whose letters represent individual components (e.g., ROY G. BIV representing the arrangement of colors in the rainbow, red, orange, yellow, green, blue, indigo, and violet). Acrostics are sentences whose first letters represent the information to be recalled (e.g., "Every good boy does fine" representing the names of musical notes on the lines of the treble clef - E,G,B,D,and F). Elaborations can be used to highlight an important feature of a word, such as a tricky spelling (e.g., differentiating the spellings of the words "principle" and "principal" by depicting a school principal as a "pal"). Special instances of mnemonic strategies can and have been developed for

specific uses. Such is the case in linking letters of the alphabet with their phonetic sounds (e.g., an "S" drawn as a snake which makes the /s/ sound). Linking letters and sounds seems to be the most prominent mnemonic strategy used with young children. Several researchers have explored this possibility.

Ehri, Deffner, and Wilce (1984) embarked on a pictorial mnemonic study spurred on by the gravity of making letter-sound connections in learning to read, the learning difficulty for some in doing so, and the observation that the arbitrary associations lend no inherent quality in the letter symbols themselves to suggest their names or sounds. Ehri's experience of having success in teaching eight letter-sound associations to children already able to name those letters, while experiencing extreme trouble, even to the point of abandoning the effort, in attempts to do the same letter-sound extraction with children who could not name the letters, also gave impetus to the study (p. 880-881.) Rohwer (1966) found that the best connectives for remembering pairs of pictures or words were meaningful "actor-action-object" relations, not side-by side depictions (as cited in Ehri, et al., 1984, p. 881), and several studies (Davidson & Adams, 1970; Ehri & Rohwer, 1969; Lippman & Shanahan, 1973; Rohwer, Lynch,Levin, & Suzuki, 1967) "confirm that paired-associate learning in children is much improved when learners create or are provided with concrete, meaningful, interactive, and imaginable connectives that link the stimulus and response terms in memory" (as cited in Ehri et al., 1984, p. 881). Previous to Ehri's study, some mnemonic treatments linking letters and sounds for pre-readers had not been very successful. Marsh and Deesberg's (1978) study using first-sound mnemonics (e.g. /e/ with elephant), and action mnemonics (e.g., a panting dog making the sound /h/) resulted in no improvement after the mnemonic picture was removed and

only the letter remained, leading them to conclude that younger children were cognitively too immature to benefit from mnemonics (as cited in Ehri et al., p. 881). Coleman and Morris (1978) used a type of fully integrated grapheme-phoneme mnemonics (e.g., a side view of a camel, with its humps forming an M, eating a dish of ice cream while saying /m/), but the associations proved to be too complex, entailing too many components (as cited in Ehri et al., p. 881).

Ehri et al. (1984) successfully developed and tested an integrated first sound mnemonic strategy. In their mnemonic pictures, the shape of the letter was a salient visual feature in the picture (e.g., a flower drawn at the end of an f, f being the stem) for the treatment group. The control group saw a picture representing the same object (e.g., a flower for letter f), but with no visual integration. Both groups practiced saying the letter's phonemic sound and writing the letter's shape. Extending the letter drawing by making it into the picture was done for the treatment group only. The training dealt with just five lowercase letters, f, l, p, g, and w. Results indicated significantly greater recall for letter-sound associations with the integrated mnemonic representation. Their conclusion was "that integrated pictures are powerful mnemonics, whereas disassociated pictures are of doubtful value in teaching letter-sound relations to prereaders" (p. 884). The study confirmed the effectiveness of integrated picture mnemonics for letter-sound relationship. Further explanation given was, that by having the letters built in to the pictures, simultaneously prompting the letter's sound, a connection was formed that enabled children to link the two in memory. The researchers proposed that the visual features of the letter must cause the mnemonic to be evoked for this effect to be applied,

and they recommended the step of writing the letters, or segmenting initial sounds to complete the stimulus-response, as required in paired-associate learning.

Similar results were obtained and documented by Agramonte and Belfiore (2002). Their method was to have upper-case consonant picture cards with 3-mm black highlighting over the 1-mm letter which was imbedded in the picture (e.g., letter F as a flag and flagpole). The pictures, when named, began with the target initial consonant sounds and were all identifiable by the students. During the one-on-one intervention, the presenter cued the student, directing him to look at the picture and repeat the prompt verbally (e.g., "d," /d/, door.) Repeated opportunities and corrective feedback were given. The picture and verbal prompt of naming the picture (known elements), were paired with the unknown elements (the imbedded letter shape, and its verbal sound as said by the teacher), providing the mnemonic treatment. Later, using letter only flashcards in random order, students were assessed, to determine improvement in giving consonant letter names and sounds without verbal or picture prompts. All three students in the treatment improved in number of consonants named and number of consonant sounds produced. Their baseline average for giving letter names improved from 9.0 to 16.0. Their ability to give letter sounds increased from 1.0 to 12.0 (Agramonte & Belfiore, 2002, p. 186). For generalization purposes, a third variable demonstrating consonant sound knowledge was assessed, by asking the child to give words that began with the sound just presented. Increased post-intervention performance on letter-sound generalization was noted. However, the increased interaction and opportunities to respond following teacher verbal prompt during the intervention may have blurred the measure of effectiveness of the integrated picture mnemonic. What it did seem to

highlight was that phonemic awareness increased. The students were able to isolate initial sounds in words other than the picture used in the treatment.

In an additional study, Belfiore teamed up with Sener, in researching the benefits of imbedded mnemonics in recalling lowercase consonant names and sounds (2005). The major differences in comparing his two studies, involved the setting and age level of the students. The students receiving this intervention were Turkish fourth graders at risk for failure in an English-as-a-foreign-language class, not kindergarteners learning their alphabet letters and sounds in their native language. Picture flashcards with imbedded lower case consonants were used in the treatment. Each lowercase consonant letter was fully integrated into a picture students could recognize, and was an essential part of the picture (e.g., c was part of the clock face). The letter was then highlighted with a 4 mm thick black stroke. These cards were then used in the mnemonic strategy as the independent variable. Treatment procedures followed much the same pattern as in Belfiore's earlier study. Generalization data included having students produce any words beginning or ending with the target consonant sound. Three students participated in the intervention and all progressed while using the mnemonic. Their improvement in letter naming ranged from 8 to 12.8, and in giving letter sounds from 4 to 7.8 (Sener & belfiore, 2005, p. 110). Generalization data also indicated improvement in most categories, ending sounds being the most difficult. The effectiveness of this mnemonic intervention was believed to be tied to the stimuli integration. The fact that the letter formed an integral part of the picture made it difficult to recall the letter without also visualizing the picture used in the presentation. The mnemonic value derived was that of

visualizing one stimulus, a picture, yet within that picture, retrieving the letter, and when spoken, providing a link to the letter sound by using the initial sound cue.

Adams (1990) states that, "The hard part about learning the visual identities of letters is that they were not designed with an eye toward visual distinctiveness or memorability" (p. 346). Further complicating the matter is that they must be recognized "across a variety of hands and typefaces" and that learning these visual identities is not easy even for those with interest in doing so. Time, practice, and careful visual attention are necessary (Adams, p. 347). Ehri et al., (1984) suggest similar issues regarding the associations between letters and their sounds, saying they are "totally arbitrary, as there is nothing inherent in the visual symbol that suggests its name or sound" (p. 881). Both researchers point to the valuable role mnemonics can play in helping to overcome this issue.

Music as an Aid to Learning

Using music as a learning tool is evident in the example of children learning the sequence of alphabet letter names by linking them to the familiar tune of Twinkle, Twinkle Little Star. Adams (1990) suggests that this is significant because:

> Because the Phonological processor is highly attuned to patterns of rhyme, rhythm, and pitch, songs are much easier to learn than unintoned lists. Moreover, teaching the letter names in such a context of rhyme, rhythm, and tune is mnemonically analogous to introducing their shapes as an integral part of a picture that reflects their sounds. That is, the names of the letters are likely to be recalled by the song, and the song recalled by names of even a few letters. (p. 359-360)

Moore, Petersen, O'Shea, McIntosh & Thaut (2008) noted substantial evidence that music can be used to facilitate verbal learning and memory when used mnemonically. They state:

> Several researchers have documented music's success as a mnemonic device both with clinical and non-clinical populations. Both adults and children have demonstrated superior learning and memory using a music format versus a spoken format when learning ballad stories (Wallace, 1994), song lyrics (Kilgour, et al., 2000), scientific information (Chazin & Neuschatz, 1990), telephone numbers (Wolfe & Hom, 1993), and names of professional sports players (Rainey & Larsen, 2002). (p. 311)

Various characteristics of music contribute to this success.

Rhythm, a musical characteristic, is one feature that may be a salient factor. It is easily recognized as helpful in musical applications, but is also valuable in nonmusical applications. It has been shown to be a mnemonics technique that aids short-term memory storage. Shehan (1987) states:

> Several factors are influential in the preservation of items for storage in the short-term memory, notably the "chunking" or organization of information into smaller units (Postman & Keppel, 1969; Slak, 1970; Higbee, 1977); acoustical properties of the material (Kintsch, 1970); visual imagery (Dickel, 1983); and serial position (Kintsch, 1970). Mnemonics has figured prominently as an aid in chunking information, providing rehearsal strategies, and defining acoustic and visual traits of the material. (p. 120)

In Shehan's study, the theory of temporal grouping of items for short-term storage was validated, as in each instance, recall was increased when rhythmic pattern grouping was used. A further example is documented by Overy (2000) citing Thompson's (1993) findings which showed improvement in dyslexic students' spelling performance following tapping numbers of syllables to a steady beat (p. 222). Bower and Bolton (1989) suggested that the mnemonic function of rhythmic pattern could stem from its counting and place-keeping features (p. 453). Beyond its rhythmic characteristics, music has proven to facilitate verbal learning and memory in other ways.

The melody of a song is a salient feature. Some reasons a melody can be a successful mnemonic strategy include: that its rhythmic and melodic phrases help to group information into chunks (Moore et al., 2008, p. 311), that the melody provides a retrieval aid, encoding aid or both (Wallace, 1994, p. 1475); and that the surface characteristics when attended to, provide helpful cues (Wallace, p.1482). Since interwoven with these are characteristics of successful mnemonics, music can be an appropriate mnemonic application.

Moore et al. (2008) expressed findings of substantial evidence demonstrating that music can facilitate verbal learning and memory. Highlighting features of successful mnemonics, they found that Reisberg (2001) indicated the value of externally organizing information that was lacking internally and Rainey & Larsen, (2002) noted that successful mnemonics create a structure for learning the material, provide for an easily remembered record of it, and facilitate future retrieval (as cited in Moore, et al., p. 310). They too concluded that structural characteristics inherent in music fit this criteria, making musical mnemonics strategically appropriate.

Wallace (1994) did several experiments that contributed to understanding how and why this is so. She determined that when the melody of a song is simple, easy to learn, and repeated, it can aid in recall beyond the text itself or its textual properties such as rhyme. Her studies led her to conclude that melodies provide an information-rich context critically connected to the text such as rhythm, chunking into melodic phrases, length of lines and intonation patterns (p. 1482). When enough of this information is acquired, recall is facilitated. That is, when certain surface characteristics in the music match the text in unique ways, it causes listeners to attend to those characteristics. She also proposed that music acts as a framework for encoding (e.g., connecting chunks and phrases) and retrieving text (e.g., helping to indicate amount of information, order of segments, and location of omissions). The strength of linking both melodic and textual components serves as a valuable retrieval device. Since music highlights multiple characteristics, it becomes a powerful stimulus. The ease of attending to and acquiring structural characteristics within the material to be remembered, its intrinsic organizational characteristics, and use as a means to cue recall are all present conditions within music, making it a good learning facilitator, thus a good mnemonic strategy. Wallace likened the link made between melody and text, to that made by image and text combinations, recognizing that the stronger the connection, the better the recall (p. 1483).

While music can be a powerful tool in learning and recall, it can also be a distractor. Wallace's experiments using music as a memory strategy found that stimulus materials indicated that music must be easily and sufficiently learned and understood to serve as an encoding or retrieval device, or it may be of no value. She found that when a melody was heard only once, or it had a tune too novel or too complex, the music served

as a distractor rather than an aid (p. 1475). Her pilot studies also showed that if the audio presentation was not clearly or easily understood, or had sound distortions, learning would not be facilitated. Other factors found to negatively impact the possible mnemonic effects of music included, complexity in rhythm, interval sizes or elaborate contour, or a poor match between text and melody (e.g., number of notes not matching number of syllables, or intonation of melody conflicting with intonation of spoken text) (p. 1483).

Music training has also been explored as to its implications on acquiring literacy. Kokas (1969), and Hurwitz, Wolff, Bortnick, & Kokas (1975) indicated acceleration of reading skills by those who participated in the Kodaly system, a carefully structured, intensive programme which teaches music basics through folk songs, into the curriculum in both Hungary and America (as cited by Lamb and Gregory, 1993, p. 20). Overy (2000) explored remediating timing skills of dyslexic children by developing a music training program using clapping and percussion games, followed by more complex rhythmic activities. Early research indicated improvement in language and literacy skills. Sutton (1993); and Kolb (1996) were said to provide helpful suggestions for improving language and reading skills, Anelay (1989) suggested that use of musical activities contributes to the development of social skills and self-confidence in children with special needs and increases sensitivity to sounds, and Wisbey (1980), developed musical activities designed to help very young children increase their sensitivity to sounds in order to help prevent potential language problems (as cited in Overy, 2000, p. 222.) She also noted that musical games are valuable to provide a fun, non-threatening environment where children, who may be experiencing failure and frustration in many other areas of schooling, could learn and practice in play (p. 227).

CHAPTER III: METHODOLOGY

Introduction and Rational for the Method

The method employed in this treatment was to use the modified Open Court Alphabet Sound Cards directly to engage the students in interactive practice, providing a mnemonic association between the alphabet letter, its sound, and a known object or action. This application was accomplished within a small group setting. Additionally, songs with original lyrics were taught to the students so that they might strengthen the link between each student's awareness of the shape of a letter, with its alliterative sound in words and familiar objects or actions using a musical and kinesthetic mnemonic. Adams' (1990) found that "there exists a wealth of evidence that the speed and accuracy with which young readers can recognize individual letters is a critical determinate of their reading proficiency and future growth" (p. 112).

Because the researcher was also the classroom teacher, a format to enable the small group treatment needed to be established. Mid-morning small group settings, called centers, were initiated from the beginning of school. Attention was focused on procedures and routines necessary to make these groups work and make a concurrent teacher-led small group possible. The small group format was begun with easy, yet engaging activities in order to establish routines and parameters. The class of twenty-two was divided into five small groups, each assigned to one specific area during daily center time. The students were assigned to groups, visiting one center per day, and then rotating to the next center the following day, so that they completed all five in a typical week.

The centers typically included an art center, a working with words center, a math center, an ABC/listening center, and the teacher's small group/reading skills center. Each area also contained additional related activities to be used by the students following the planned activity, to balance the variable times needed in each and to prevent interruption to the teacher's small group.

Before the alphabet sound cards were presented to the students in the teacher-led group, modifications were made to them. This was necessary to promote the mnemonic associations desired, and reduce potential confusion from using aspects of two different curriculums. The pictures added to the cards were similar in size, were colorful, and preserved the professional quality obtained by using the alphabet cards. Simple, rhythmic letter sound "jingles" were written, relating the letter sounds with alliteration to the pictured objects.

Each morning, prior to centers, a group language teaching time would occur, where the alphabet letters would be presented in a letter of the week format. It would be in this context that the songs connecting a concept related to the letter, its sound, and the letter shape, would be taught by the researcher. The students would be encouraged to join in quickly. Attention would be drawn to the kinesthetic motions that emphasized the specific letter's shape. The songs would continue to be sung bi-weekly throughout the treatment. Review of all individual letters or sounds introduced so far would take place using flashcards in random order. These cards showed just a single form of the letter, upper or lowercase. Both types of mnemonic treatments had been shown appropriate for the developmental level of the students, and provided learning strategies that could aid in mastery of this essential skill.

Population of the Study

The group represented in the study included twenty-two kindergarten students, eleven male and eleven female. The average age was five years, nine months at the beginning of the school year, ranging in age from 5 years, 3 weeks, to 6 years, 5 months. Their ethnic representation was 9% African American, 77% Caucasian, and 14% multi-racial and other ethnicities. The setting was a private Christian school with one teacher in the classroom. A high school student aide came to help for most of center time each day, about forty-five minutes. She helped with details of overseeing the non-teacher led groups. Parents were also invited to sign up to help at this time of the day. One was consistent in coming to help once per week, others helped occasionally.

Procedure

For the treatment, the researcher met with a small group of four to five students for twenty-plus minutes, once or twice weekly. Initially, part of this time was spent becoming familiar with the alphabet sound cards, including the upper and lowercase letters, and discussing the related pictures on each one to ensure familiarity. Then at each session, the teacher led the group in saying all twenty-six jingles, while showing the coordinating pictorial alphabet sound cards one at a time. The students were encouraged to join in as quickly as possible. At times, individual students, or pairs of students were asked to say some of the jingles prompted only by the cards. Following the alphabet card exercise, the students practiced writing alphabet letters using individual white boards and dry erase markers. Letter strokes were emphasized. As a generalization application, letter sounds were given by the teacher, and students were asked to write the letter making that sound in a dictation type activity. A progression of application from single letter sounds, to successive sounds in syllables and words, and eventually to sentences

occurred throughout the year as mastery was attained. Application to reading also followed a progression from giving letter sounds, to blending into consonant-vowel syllables, to reading words and sentences.

Data Collection Methods

Initially, the students were screened individually by the researcher to determine which alphabet letters they could name, upper and lowercase, and subsequently which sounds they could give, also upper and lowercase. The format used was to show the student a standard sized paper with four lines of randomly ordered alphabet letters in large black font, where the letters were pointed to one at a time by the researcher. In left to right, top to bottom order, each student was asked to respond orally, giving letter name or letter sound depending which was being tested. Each correct answer was scored as one. Letter name and letter sound knowledge were tested separately. Follow up screening was done using the same format, following the ten week treatment. Letter name and letter sound knowledge for the nine letters for which mnemonic songs were taught, was extracted and represented separately, to reflect the impact this second independent variable, the songs, might have had.

Treatment Variables

The dependent measures in this treatment were the number of alphabet letters (lowercase and uppercase) the student named correctly when shown each one, and the number of alphabet letter sounds (lowercase and uppercase) correctly given when shown a specific alphabet letter. The sounds taught and tested in this application were short vowel sounds, and hard consonant sounds where applicable. As reflected in the time table of the study, the mnemonic songs coincided with nine "letter of the week"

presentations in the curriculum. These target letters taught and tested, in order of their presentation, were Oo, Ss, Zz, Tt, Dd, Ii, Aa, Uu, and Ee. Both uppercase and lowercase letters were introduced during the same week. Quality children's literature relating to the letter of the week was read to the students during each week.

The first independent variable was the mnemonic strategy in which the alphabet cards used in the presentation, including both uppercase and lowercase letters, were linked with a picture depicting an object or action, and a spoken, alliterative jingle. The second independent variable was a mnemonic strategy using teacher created songs to further link the correlation of the letter sounds with the known objects or actions, and the letter shape using a kinesthetic action related to the letter's shape.

Data Analysis and Safeguards to Validity

A comparison of the baseline knowledge of each student regarding the letter names and sounds, with his or her knowledge at the end of the treatment would be used to show the effectiveness of the treatment. The number of correct letters or sounds given in comparison to those reflected at baseline testing would be represented numerically with each correct response scored as one, and then depicted on a graph. No statistical analyses would be run or reported. Because two of the students already knew all of the letters and sounds at the baseline testing and therefore could not improve (ceiling effect), their scores were not included nor represented graphically. It was hypothesized that by using the mnemonic treatments all remaining students would improve or reach mastery in the number of letters and sounds given correctly. Test results were also those reported to the school principal, as well as to parents at parent-teacher conferences and on student's report cards, representing a validity safeguard.

CHAPTER IV: RESULTS & ANALYSIS

Introduction

As a result of the use of the mnemonic strategies, the pictorial alphabet sound cards and jingles, and the mnemonic associations within songs, measurable progress occurred in both letter naming, and generating correct individual letter sounds. Alphabetic testing, such as this, has a ceiling effect because of the fixed number of letters and sounds in the alphabet. Two of the students in the study had already reached this ceiling in both letter recognition and letter sound knowledge at baseline testing, so their scores were not included in the data reported. The remaining students in this study showed greater initial knowledge of uppercase letter names and sounds, than they did of lowercase. This concurs with other research findings and may be indicative of the more frequent use of uppercase in environmental print, and because there are fewer similarity and orientation issues such as those found in b, d, p, and q where orientation of the letter is the discriminating factor. Due to these initial baseline differences, the numerically reported amount of improvement was less when there was less room for improvement before reaching ceiling effect.

Description of the Data

Post-treatment data was collected and recorded reflecting each student's knowledge of the complete alphabet, upper and lowercase, both for naming and for generating typical letter sounds. This was compared to each student's baseline data to reflect the effect of the mnemonic treatment variable using the pictorial alphabet sound

cards and jingles. From that data, knowledge limited to the nine target letters for which the mnemonic songs were taught, was extracted and separately represented. Once again, comparison would be made with each student's baseline data reflecting the added effect of the musical mnemonic. As an additional measure of perceived results, parents of the students involved were asked to respond to a survey giving their input as to their viewpoint of the effectiveness of the treatments and setting.

Data, Analysis, and Conclusions

Baseline data on the number of uppercase alphabet letter names said correctly by the kindergarten class of students ranged from 10 – 26, with a class average of 23.5 out of 26. When tested after the treatment, the number of uppercase letter names said correctly increased to a range of 20 – 26, with a class average of 25.3. This represented improvement of +1.8.

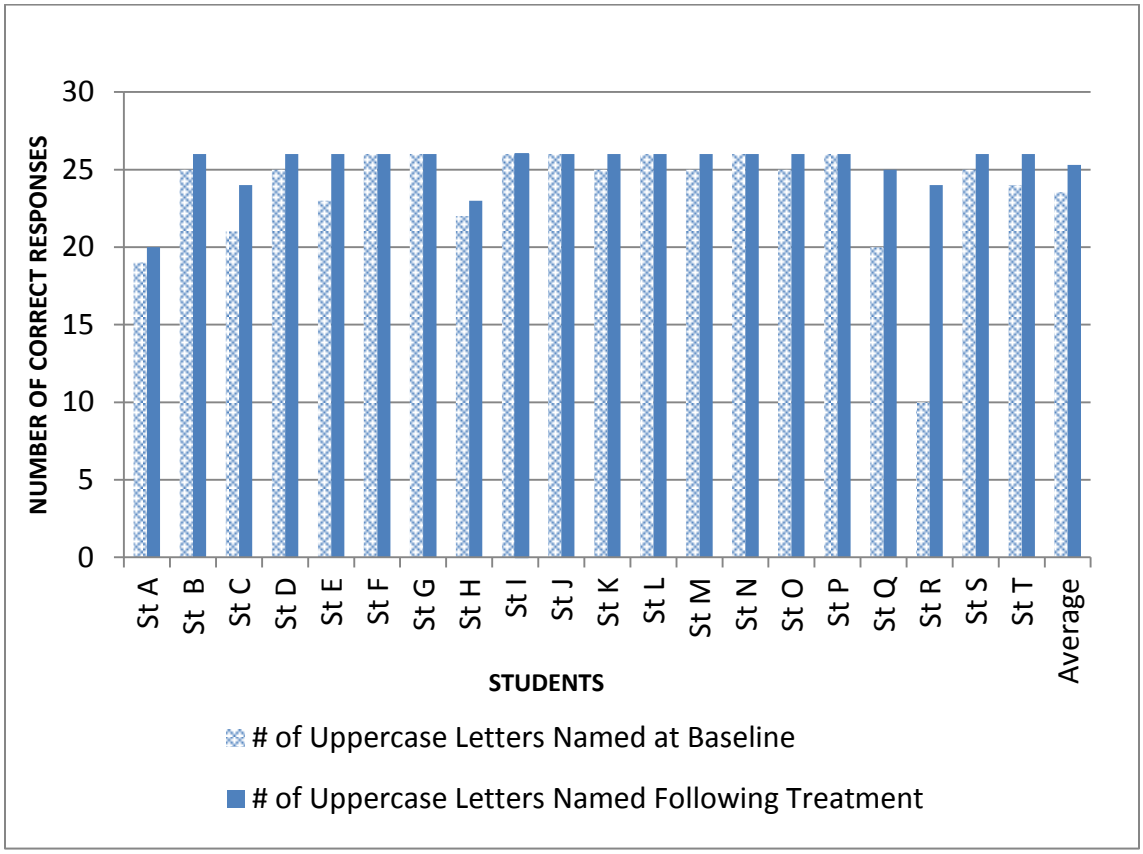

Figure 1. Uppercase Letter Name Knowledge of Complete Alphabet

Baseline data on the number of uppercase alphabet letter sounds said correctly by the kindergarten students ranged from 5 - 26, with a class average of 16.55 out of 26 given correctly. When tested after the treatment, the number of uppercase letter sounds given correctly ranged from 12 – 26, with a class average of 22.25. This represented an improvement of +5.7.

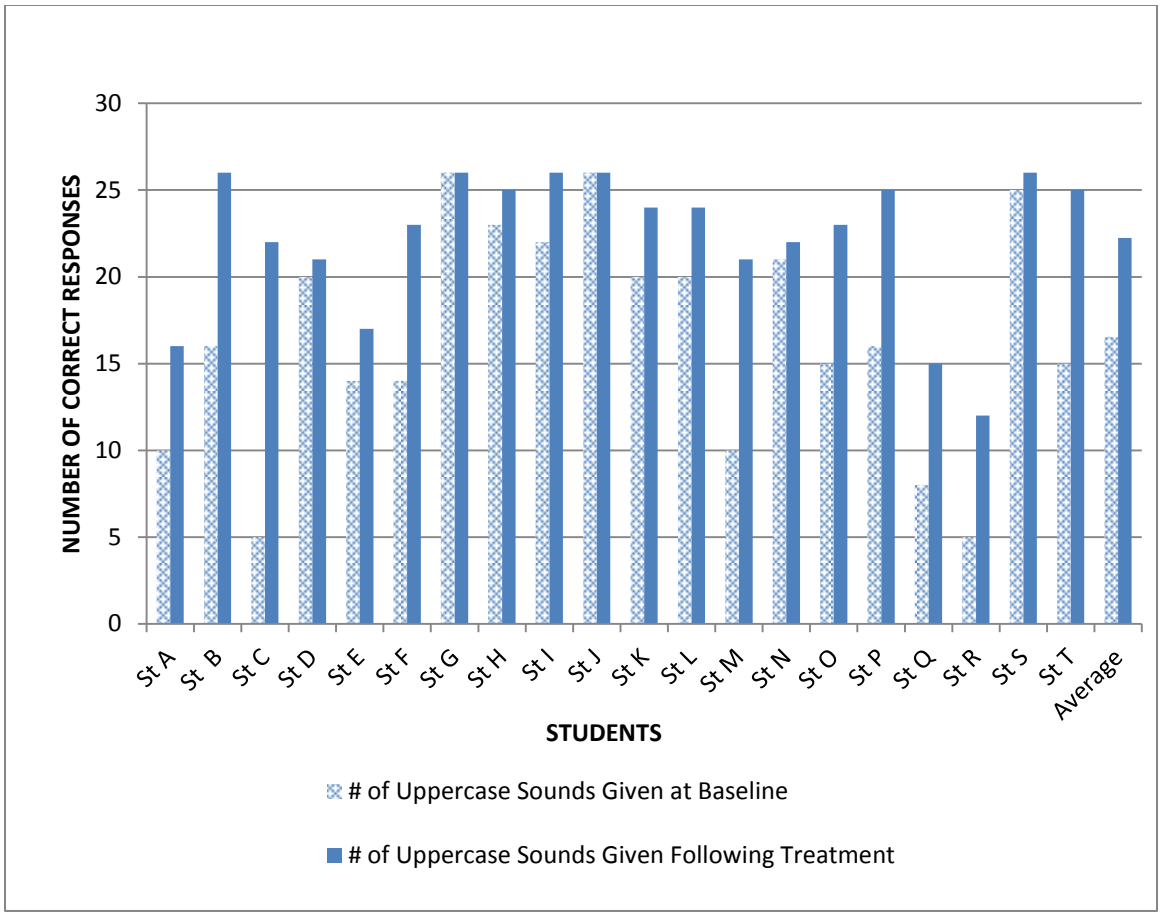

Figure 2. Uppercase Letter Sound Knowledge of Complete Alphabet

Baseline data on the number of lowercase alphabet letter names said correctly by the kindergarten students ranged from 5 – 26, with a class average of 21.2 out of 26. When tested after the treatment, the number of lowercase letter names said correctly ranged from 18 – 26, with a class average of 24.2 correct. This represented an improvement of + 3.

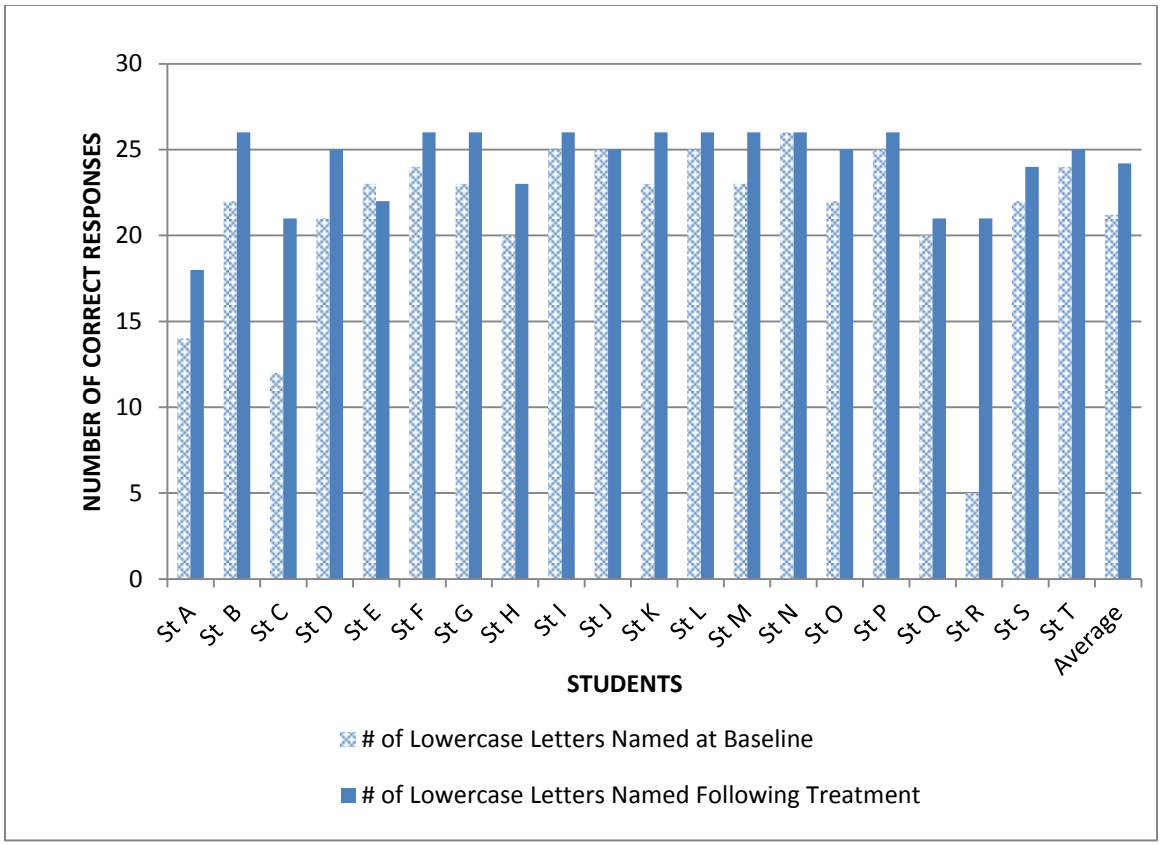

Figure 3. Lowercase Letter Name Knowledge of Complete Alphabet

Baseline data on the number of lowercase alphabet letter sounds said correctly by each student ranged from 3 - 25, with a class average of 14.35 out of 26. When tested after the treatment, the number of lowercase letter sounds given correctly ranged from 12 – 26, resulting in a class average of 21.75. This represented an improvement of +7.4.

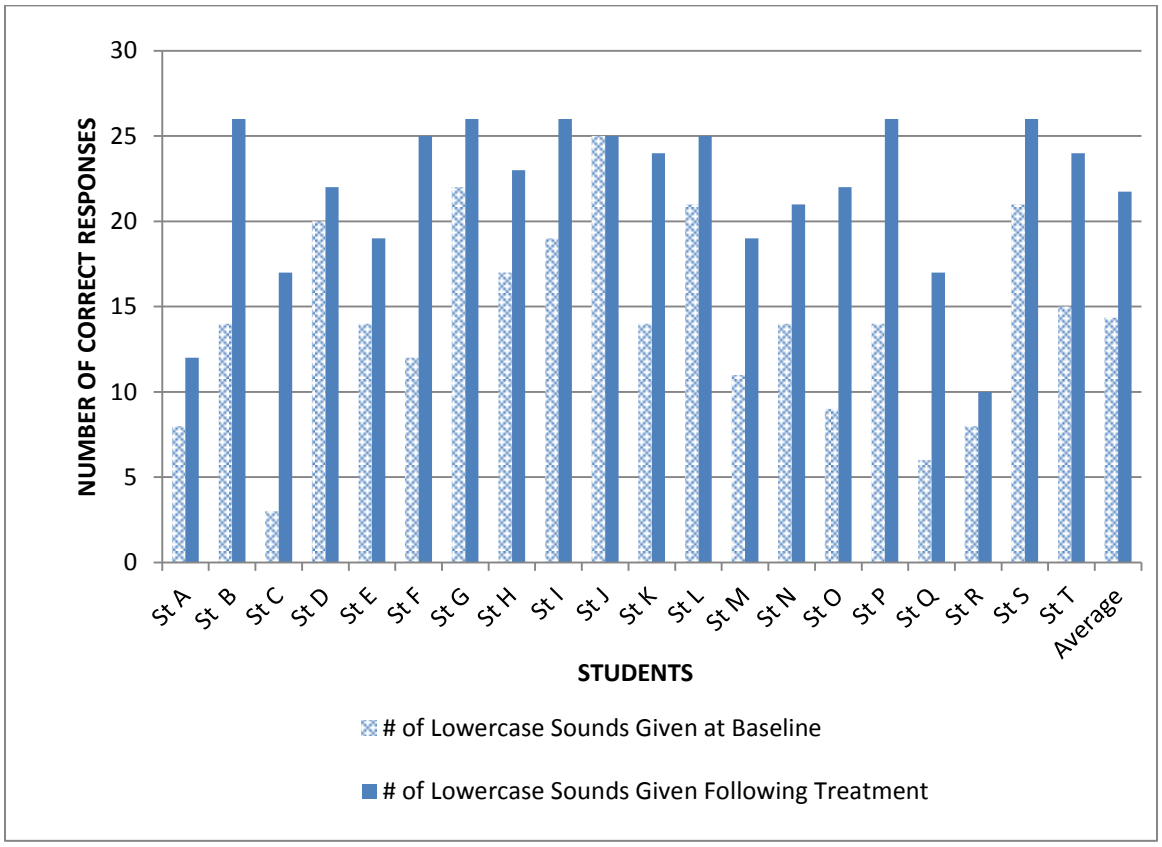

Figure 4. Lowercase Letter Sound Knowledge of Complete Alphabet

Baseline data on the number of students able to say target uppercase letter names correctly ranged from 15 – 20, with a class average indicating 18.55 out of 20 successfully giving the letter names. When tested after the treatment, the number of students correctly giving target uppercase letter names ranged from 17 - 20, with an average of 19.67. This represented an improvement of +1.07 with the average nearing the ceiling effect.

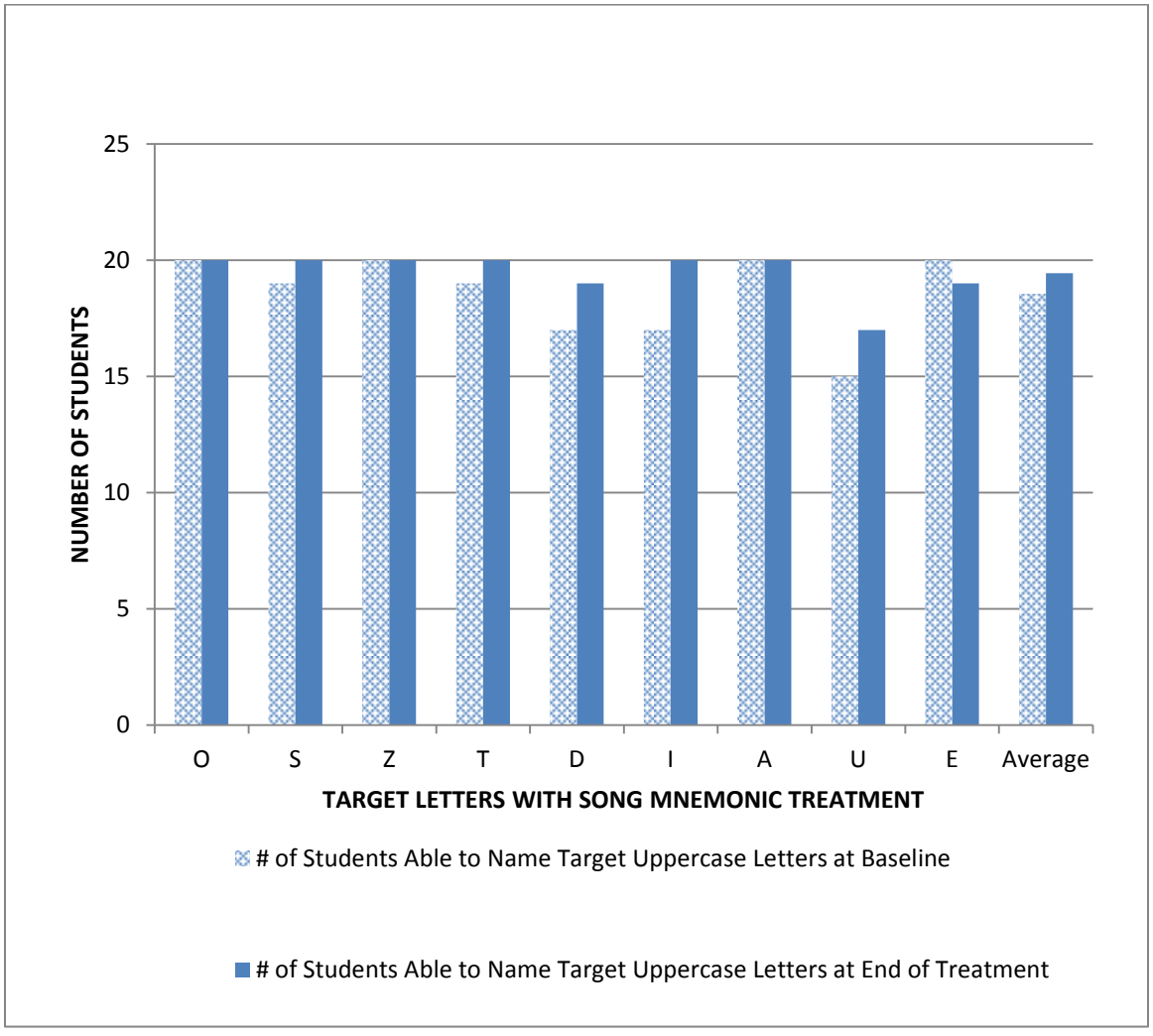

Figure 5. Knowledge of Uppercase Target Letter Names.

Baseline data on the number of students able to correctly say target uppercase letter sounds ranged from 6 – 19, resulting in a class average of 14.44 out of 20. When tested after the treatment, the number of students correctly giving target uppercase letter sounds ranged from 14 - 20, with a class average indicating correct sounds given by 18.67 out of 20. This represented an improvement of +4.23.

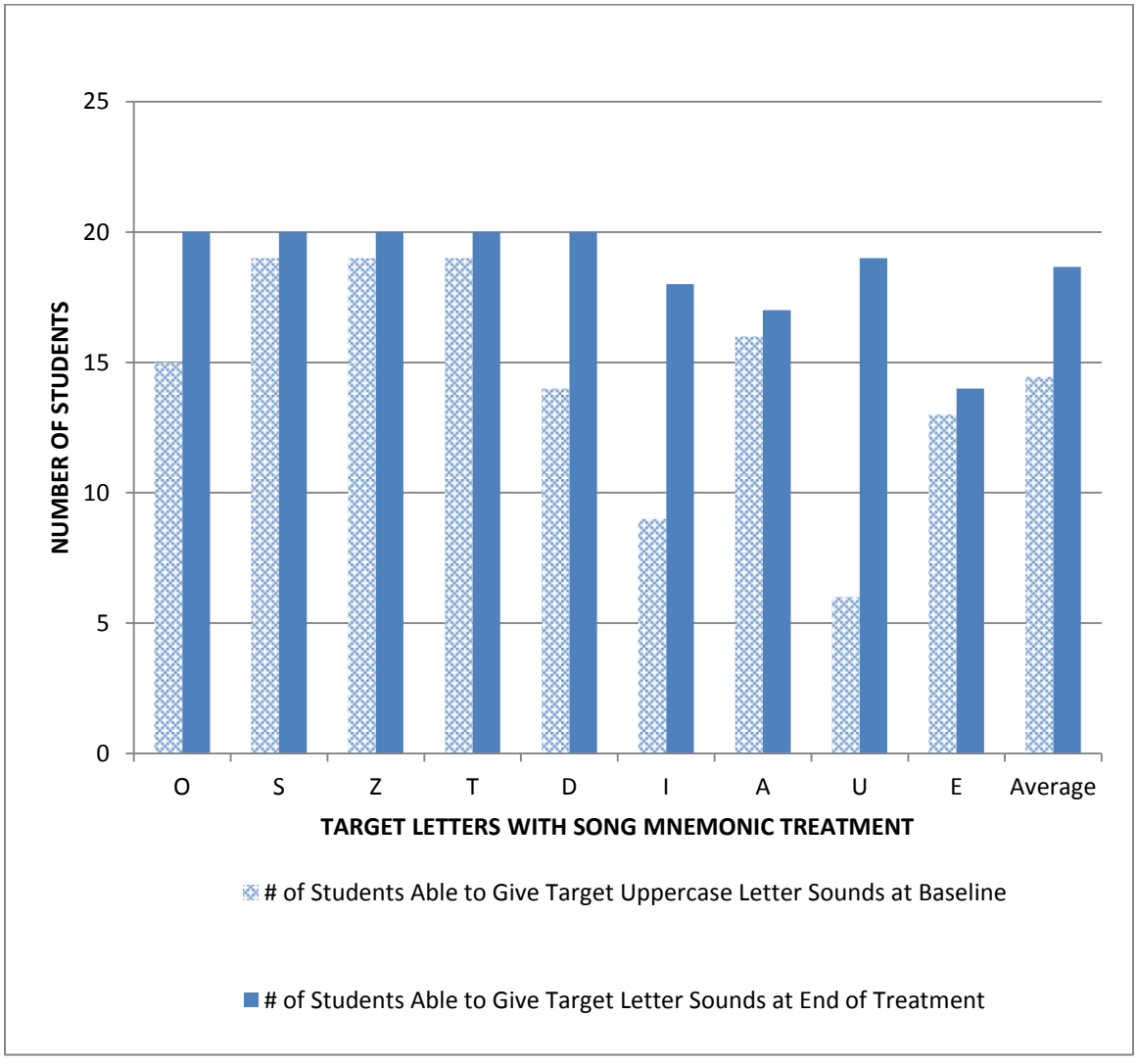

Figure 6. Knowledge of Uppercase Target Letter Sounds.

Baseline data on the number of students able to say target lowercase letter names correctly ranged from 10 – 20, with a class average of 17.89 giving names successfully. When tested after the treatment, the number of students correctly able to give target lowercase letter names ranged from 19 - 20, with a class average of 19.44 nearing ceiling effect. This represented an improvement of +1.45.

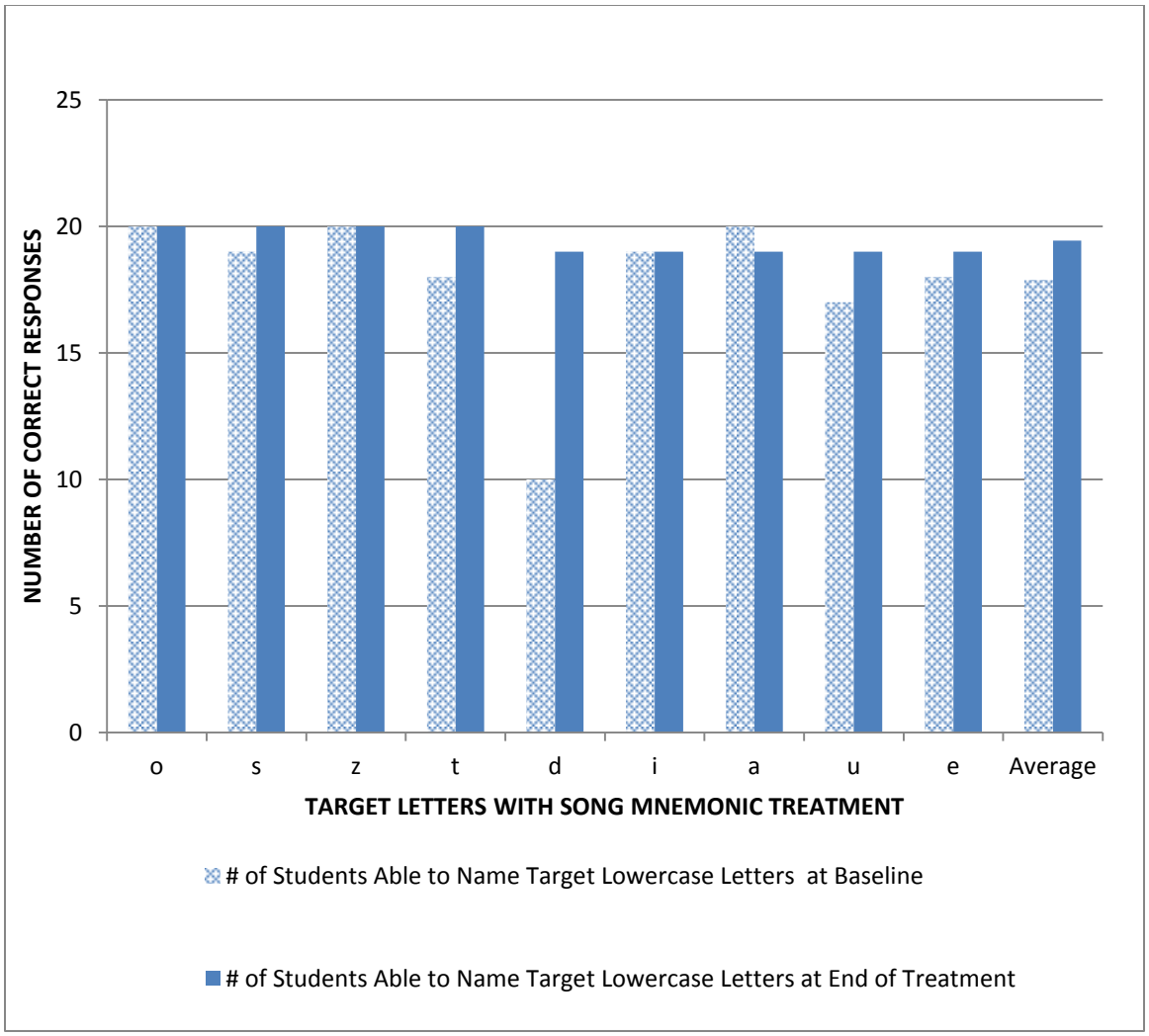

Figure 7. Knowledge of Lowercase Target Letter Names.

Baseline data on the number of students able to say target lowercase letter sounds correctly ranged from 5 – 20, with a class average of 13.33. When tested after the treatment, the number of students correctly giving target lowercase letter sounds ranged from 15 - 20, with a class average of 18.89, nearing ceiling effect. This represented an improvement of +5.56.

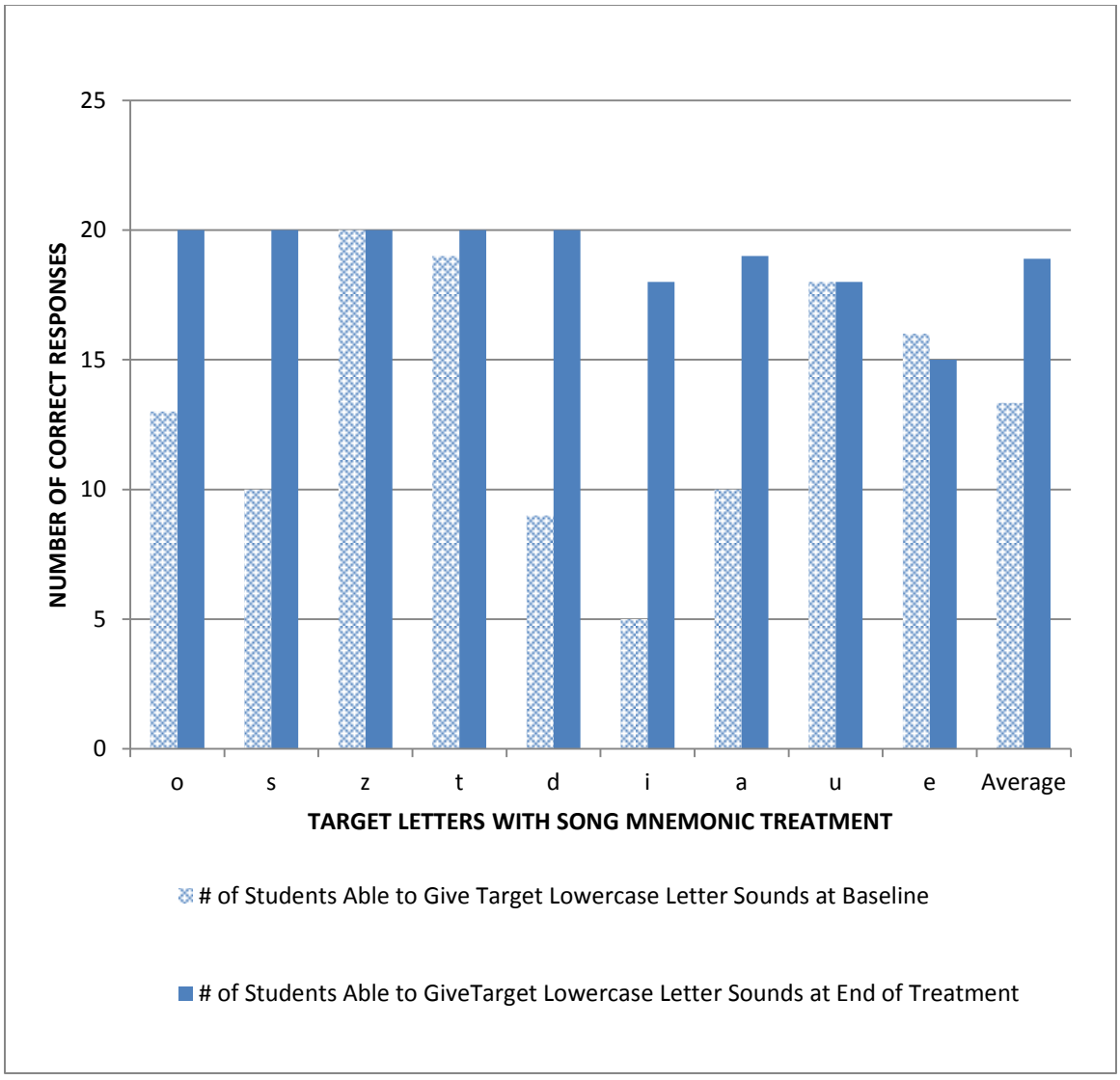

Figure 8. Knowledge of Lowercase Target Letter Sounds.

CHAPTER V: SUMMARY

Interpretations of the Results

The findings of the study indicated measurable improvement in the students' abilities to give letter names and sounds, confirming the hypothesis that the mnemonic treatments would be effective in increasing letter-sound knowledge. There were no treatment non-responders, all students improved, some reaching mastery or ceiling effect. In the category of naming alphabet letters on sight, the class average post-treatment score for uppercase was 25.3 out of 26, and for lowercase, 24.2 out of 26. Although it is significant that it approached ceiling effect for a classroom of kindergarten students, this has been demonstrated to be an easier skill than that of giving letter sounds. The low end of the score ranges, 20/26 correct for uppercase, and 18/26 correct for lowercase, indicated that some students still needed additional teaching, practice, time or intervention to master these skills.

The greatest overall improvement was shown in the category of giving correct letter sounds. Improvement indicated by the class average was +7.4 for lowercase sounds, and +5.7 for uppercase letter sounds was significant. The low end score ranges of 12/26 correct for lowercase, and 12/26 correct for uppercase again indicated that some students would benefit from additional teaching, time, practice or intervention. None of these letters and sounds is unimportant, because all alphabet letters are used within written words in reading and writing. Mastery of all letter sounds is necessary for

fluency and comprehension. What did seem apparent was that measurable learning was taking place, indicative of the fact that the mnemonic alphabet card and jingle treatment was having a positive effect. Parent responses indicated that from their perspective, this was viewed as the most helpful aspect in learning letter sounds. The nine target letter sounds presented in the curriculum, and for which the songs were taught, had the second most measurable gain. This fulfilled the hypothesis that there would be significant improvement seen, since in essence, there was a double mnemonic treatment taking place for these letters. Additionally, the songs built connections to the emphasis provided in the letter of the week curriculum. Scores were reflected for the 20 students not attaining perfect scores at baseline testing. Class averages for both lowercase and uppercase letter sound knowledge improved (+5.56 for lowercase, and +4.23 for uppercase) with the class average (18.89 and 18.67 respectively) nearing ceiling effect. The low end scores for number of students able to give these letter sounds improved significantly increasing by +8 for uppercase and +10 for lowercase, but still there were 5/20 students for each category who did not achieve mastery. Parent and student responses indicated that the songs were perceived as a helpful way of learning and reviewing.

It is difficult to extract the impact other factors might have had on the students' learning. For instance, other curriculum teaching, singing, stories, along with activities done during the weeks in which the mnemonic songs were taught could have influenced the effect that has been credited to the music mnemonic. Perhaps the ongoing repetition of songs due to their order of presentation, their singability or likeability was also influential. The phonological characteristics of the letter names in relation to their sounds, or their location in the alphabet, as shown in other research, likely impacted the

ease or difficulty of recollection as well. Other factors, such as parental awareness and practice, and students' verbal memory capacities may have been influential. By not having a control group, nor running specific statistical analyses, it is difficult to determine the precise effect of each mnemonic treatment.

In the parental survey responses received, the majority indicated that from their perspective, that the alphabet jingles were the most helpful. A bus driver also commented about hearing students spontaneously repeat the jingles. The second most frequent response indicated the benefit of the songs. Parents were positive about the room arrangement and learning-center approach and felt the stimulation was about right. They indicated that center time was the most frequently talked about time of the day, followed by Bible time and story time which had an equal number of responses.

Potential Applications of the Findings

Curriculum selections are made within school systems, and given to teachers who are typically given some flexibility, with accountability, in the application of the materials they are given to use. Research results, and best practice findings are also considerations in helping teachers and schools improve their students' educational outcomes. The findings of this study indicate that using mnemonic techniques to link alphabet letters and sounds to known pictures, actions, and songs moved students positively toward mastery of the alphabetic principle, and its application to letter recognition and sounding, which are foundational to reading. Perhaps others can be encouraged to use mnemonic strategies knowing that with slight modifications, materials were used within given curricular bounds. By using these strategies to help students acquire basic, yet significant literacy components, it is hoped that the students in this

study gained the foundation that would thrust them into early literacy with all its benefits. Students can be helped to have the incremental skills needed to be proficient, rather than at risk in reading. Strategies such as mnemonics, incorporating visual aids, rhyme, jingles, music, kinesthetic motions, phonemic awareness, and phonics, serve to enhance learning by young students, and make learning memorable and fun. Such approaches can be integrated within most assigned curriculums with some effort and modification when necessary. Stein (1999) suggested possible modification of materials or program enhancement, when deemed necessary, by designing explicit instruction in letter-sound correspondences and providing for phonologically based word identification strategies when lacking (p. 286). It is hoped that those making curriculum choices for beginning readers will pursue an awareness of what is effective, and seek to provide curriculum which provides excellent foundational knowledge and application, while promoting development of strategic, effective teaching practices.

Relation of the Results to Theory and Other Literature

Previous studies have found that using mnemonics has proven effective for recalling content information, specifically with young children, in their recall of letters and sounds. The current study found similar positive results in letter name and sound knowledge, showing definite improvement when linking unknown information to a known stimulus, so that recall was enhanced. However, the current study differed from the conclusions of Ehri et al., (1984) who concluded that fully integrated pictures were powerful mnemonics, whereas disassociated pictures were of doubtful value in teaching letter-sound relations to pre-readers. It also contradicted findings by Marsh and Desberg (1978) and Samuels (1967) that when the pictures were removed, recall was no better

than that of control subjects, and that younger children may be too cognitively immature to benefit from mnemonics (as cited in Ehri, et al., 1984). This study concurred with the findings that music is helpful as a mnemonic strategy when the music's characteristics are repeated and fitting.

Some differences between this study and others include: the fact that the researcher included the whole class, not just a small group in the treatment; that the researcher was also the sole classroom teacher, which necessitated setting up the teaching situation so that all of the students were appropriately engaged, allowing for the treatment group to occur; that testing was done by the researcher-teacher within the classroom setting, and therefore was less frequent; that the letters were not imbedded in the stimulus; and that songs with kinesthetic motions were used to teach letter-sound correspondences, which the researcher found no previous research evidence of.

Strengths and Limitations of the Study

The current study gave impetus to the use of effective and enjoyable memory strategies for learning the necessary letters and sounds of the alphabet. Although the mnemonic strategies used were not the more well known or typical ones used by older students, they were developmentally appropriate and resulted in knowledge gains.

Limitations of the study include the lack of a control group, and lack of additional baseline screening measures and statistical analyses to better determine the exact effects of the independent variables. It is difficult to extract other factors influential in children's learning, and definitively attribute the gain in knowledge to a specific known factor without such analyses. Broader and more frequent testing might have been helpful, but was not practical for the researcher-teacher. Adding a timed element in the letter testing,

shown to be a factor in predicting reading skills in other literacy research, may have also impacted the findings. Additionally, within the current findings it would be interesting to analyze the letters learned and those not learned, in light of their phonological properties as have been explored by others. Repetition and/or modification of the current treatment, and longitudinal follow-up would also be helpful in confirming its validity.

Suggestions for Future Research

Among the challenges to teaching letters and sounds is the lack of resemblance of their uppercase and lowercase forms in more than half of the alphabet. The studies that have shown mnemonic strategy effectiveness by imbedding letters into pictures are most often limited to just a few letters, or only to uppercase or lowercase letters. It seems there would be even greater significant impact if both upper and lowercase letters could somehow be imbedded into a single pictorial stimuli and the effectiveness of doing so was studied.

In the given study, if repeated, it would be helpful to test whether the pictorial stimulus alone could evoke the letter jingle, or if by saying just the auditory jingle, the letter could be said or written by the student. The current researcher always presented the cards that had both picture and letters, and only tested from the vantage point of the letter alone being presented, and its name or sound being given by the student. Repeating the study using imbedded letter mnemonics, even if for just the lowercase letters, would be of interest.

In a classroom setting with only one teacher, having an additional person to do the testing at least some of the time would be helpful. Additionally, more of the pictures, and therefore the jingles would be modified to further coordinate the mnemonic and

curriculum emphasis, given additional time and resources. Adding the letter name to the beginning of the jingles would also be applied.

Conclusion

The breadth of information, and the gravity of ramifications regarding approaches to literacy are enormous, and could be pursued seemingly endlessly. There is so much more involved even in beginning reading instruction than merely the level portrayed in this study. Establishing the firm foundational grasp of letter names and letter sounds is indeed a documented, vital beginning reading skill for young learners, and making learning memorable, enjoyable and successful is also vital. Yet of equal importance in impacting literacy success, is that we as educators must sharpen our levels of awareness and application just as critically as our students must sharpen their phonemic awareness and letter knowledge. As Adams (1999) expressed, (some) "children will come to know only what we have helped them to learn and only as we have helped them to learn it. . . If we want our students to learn to read, we must make reading learnable for them" (p. 292).

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APPENDIX A

JINGLES USED WITH PICTORIAL ALPHABET CARDS

Aa* **Allergies, allergies /a/ /a/ choo**
Bb **Bouncing ball, bouncing ball /b/ /b/ /b/**
Cc **Clicking camera, clicking camera /c/ /c/ /c/**
Dd* **Digging dog, digging dog /d/ /d/ /d/**
Ee* **Exercise, exercise /e/ /e/ /e/**
Ff **Freddy fan, Freddy fan /f/ /f/ /f**
Gg* **Gooey gum, gooey gum /g/ /g/ /g/**
Hh* **Happy hug, happy hug /h/ /h/ /h/**
Ii* **Itchy i, itchy i /i/ /i/ /i/**
Jj **Jumping rope, jumping rope /j/ /j/ /j/**
Kk **Clicking camera, clicking camera /k/ /k/ /k/**
Ll **Licking lion, licking lion /l/ /l/ /l/**
Mm **Munching monkey, munching monkey /m/ /m/ /m/**
Nn* **No never, no never /n/ /n/ /n/**
Oo* **Octopus, octopus /o/ /o/ /o/**
Pp **Popping corn, popping corn /p/ /p/ /p/**
Qq **Quacking ducks, quacking ducks /qu/ /qu/ /qu/**
Rr* **Rain and rainbow, rain and rainbow /r/ /r/ /r/**
Ss* **Slithering snake, slithering snake /s/ /s/ /s/**
Tt **Ticking timer, ticking timer /t/ /t/ /t/**
Uu* **Under and up, under and up /u/ /u/ /u/**
Vv **Vacuum cleaner, vacuum cleaner /v/ /v/ /v/**
Ww **Washer, washer /w/ /w/ /w/**
Xx* **X-ray, x-ray /x/ /x/ /x/**
Yy **Yacking yaks, yacking yaks /y/ /y/ /y/**
Zz* **Zipping zipper, zipping zipper /z/ /z/ /z/**

***Picture changed from original alphabet card**

APPENDIX B
SONGS WITH MNEMONIC ASSOCIATION
Lyrics by Janet Shaeffer

O Went to the Ocean
(Short O)
(Tune – The Bear Went Over the Mountain)

By Janet Shaeffer

The vowels went on an adventure,

The vowels went on an adventure,

The vowels went on an adventure,

And this is what they saw.

The O went to the ocean, *(Hands make an O over head, make swaying motion)*

The O went to the ocean,

The O went to the ocean,

And this is what he saw

An octopus in the ocean, *(Make an octopus with hand and fingers)*

An octopus in the ocean,

An octopus in the ocean,

Yes this is what he saw.

A lobster in the ocean, *(Make pinchers of lobster with fingers)*

A lobster in the ocean,

A lobster in the ocean,

Yes this is what he saw.

A dolphin in the ocean (3x), *(Make a dolphin with right hand, arch over left arm)*

Yes this is what he saw.

SLITHERING SNAKE

(Letter S)

Tune – When Johnny Comes Marching Home

By Janet Shaeffer

The snake was sleeping in the sand
(Thumbs and pointer fingers form circle)

Like this /sh/ *(pointer to lips)*, like this /sh/ *(pointer to lips)*

When he awakes an **S** he makes like this /S/, like this /S/
(*Form a C and a backwards C with thumbs and pointer fingers. Touch thumb of one hand to pointer finger of other hand to form letter S. Teacher must do this in reverse to show proper S to students*.)

If you see him
(Air write a letter C- forming top of an S)

You'd better turn around, *(Air write bottom of letter S) (Again, teacher forms it so S is seen correctly by students.)*

For he strikes *(Abruptly close fist)* and swallows *(Wrap other hand's fingers around closed fist)* what he has found,

And he makes his favorite sound /S/,

All around /S/, on the ground, slithering snake! /S/S/S/ (*Sustained /s/ sound.)*

Z's All Day
(Letter Z)
(Tune – Turkey in the Straw)

By Janet Shaeffer

Well I woke up this morning with some zest in my step. *(Make a Z shape with foot)*

Zapped myself some oatmeal, to add to my pep. *(Make a Z shape with finger, act as if pushing buttons on microwave)*

Zipped up my zipper *(pretend)* found a zigzag on my shirt *(look at hem inside shirt for zigzag stitch),*

Zoomed out the door to go to school and work *(Make z motion with hand as if following a zigzag path)*

We drove slowly through the school zone,

I got out and went inside,

Made a zebra for the zoo, (*Make stripes motion)*

Wrote my zeros with pride. *(Draw zeros in the air)*

I've seen Z's all day *(Air write Z),*

I'll catch zzz's all night *(Tip head on hands to "sleep")*

As I sleep beneath a zillion stars *(Make hands spread open for stars)*

That shine so bright.

Tall, Tall Tree
(Letter T,t)
(Tune – It's a Small, Small World)

By Janet Shaeffer

It's a tall, tall tree with a branch on top, *(Arms up and out like a palm tree)*

Or a tall, tall tree with a branch across, *(Arms out at shoulders)*

Look around carefully *(Hand above eyes, look around)*

Deep inside every tree is a tall, tall t. *(Arms up then out at shoulders)*

Look at branches *(Arms out)*

Look at leaves *(Hands wave up and down)*

Look at fruit *(Pretend to pick)*

And look at seeds *(Bring hand close as if to observe)*

God made such varieties

In the tall, tall trees. *(Arms up then out at shoulders)*

Doggie, Doggie
(Letter D,d)
(Tune – Bicycle Built for Two)

By Janet Shaeffer

Doggie, doggie, these are the things you do

Dig, fetch, sit, beg, *(Act each)*

Find things that you can chew. *("Chew" finger)*

You bark at the sign of danger, *(Arf, Arf)*

Protect when there's a stranger. *(Grrrr)*

The best thing yet, is you're my pet

You're my dog with the wagging tail. *(Make circle with hand, then stick pinkie up for tail and wag it. – Teacher must use left hand to make small d, students use their right hands.)*

Itchy I

(Short i)

(Tune – I've Been Workin' on the Railroad)

By Janet Shaeffer

I was interested in insects

In the air and in the ground, and in between *(Make strokes of capital I while singing each phrase)*

Lots of itty, bitty insects, black and yellow, red, brown, green.

Walking, hopping, flying insects *(Fingers crawl up, hop, then fly off other arm)*

Some are nice and some are mean. Ouch! *(Pinch self)*

If you ever meet an insect,

You'll know what I mean.

You might be

Itchy on your nose *(scratch it),* itchy on your toes *(scratch them),*

Itchy anywhere he goes *(Scratch other places).*

Itchy on your chin *(scratch it),*

Itchy on your skin *(scratch arm),*

Anywhere you let him in.

Itchy i! *(Make strokes for lower case i)*

A-a-choo
(Short a)
(Tune – Rueben, Rueben)

By Janet Shaeffer

Some people a-a-choo when they have allergies, *(Finger under nose representing uppercase A, with nose being the sides, finger the line across)*

A-a-choo when a cold they catch, *(Finger under nose)*

But in school we a-a-choo *(Finger under nose)*

Because short a (*make strokes of lowercase a)* makes a sound like that!

/A/ at the front of a word like apple *(Pretend to bite one)*

A in the middle of a word like rat *(Pointer fingers meet together, then fingers make running motion)*

But at the end, as in spa and banana,

The a says uh *(punch tummy)* or the a says ah *(make a tent over head).*

Glug, Glug, Glug
(Short u)
(Tune – Three Blind Mice)

By Janet Shaeffer

Glug, glug, glug.

U pulled the plug. *(Pretend to pull a bath tub stopper)*

Water went under the house *(Make down/up motion of u)*

And under the ground, *(Make down/up motion of u)*

Under the street *(Make down/up motion of u)*

And under the town. *(Make down/up motion of u)*

Then up to be cleaned *(Point up)*

And then back around, *(Make an arch then point down)*

Glug, glug, glug.

Blub, blub, blub,

U filled the tub.

With rubber ducky and bubbles and suds,

A boat to tug, and brushes to scrub.

For fun in the tub, and scrub-a-dub-dub.

Blub, blub, blub. Blub, blub, blub.

Repeat 1st verse, end with /U/

Exercisin'
(Short e)
(Tune: Oh, Susanna)

By Janet Shaeffer

Oh, I'm eatin' well *(Pretend to eat)*

And gettin' rest *(Head leans on hands as if sleeping)*

So healthy I can be. *(Point at self)*

Breathin' air that's fresh *(Take a big breath)*

As I bend and stretch *(Turn sideways, and squat down while making 3 punch out strokes for the horizontal strokes of uppercase E)*

Gettin' strong like letter Ee. *(Arm straight out then circles around making strokes of lower case e)*

/E/, /e/, /e/, Exercisin'

Yes, that's the life for me!

Breathin' air that's fresh *(Take a big breath)*

As I bend and stretch *(Turn sideways, and squat down while making 3 punch out strokes for the horizontal strokes of uppercase E)*

Gettin' strong like letter Ee. *(Arm straight out then circles around making strokes of lower case e)*

(Next section is spoken, teacher first then class echoes)

1, 2 bend and touch your shoe.

1, 2 bend and touch your shoe. (*Touch shoe)*

3, 4 find the exit door.

3, 4 find the exit door *(Fingers point in opposite directions to nearest exits like windshield wipers)*

5, 6 pretend to lift bricks

5, 6 pretend to lift bricks *(Reach down, lift to illustrate heavy weight)*

7, 8 leg out straight

7, 8 leg out straight. *(Swing leg back and forth)*

9, 10 run in place and then *(Begin running in place while counting, stop at 10)*

1,2,3,4,5,6,7,8,9,10 The End!

APPENDIX C

PARENTAL SURVEY

Parents, I would greatly appreciate your input on this survey for my graduate project. You may add comments on any answer. You may answer anonymously by returning this to the school office. Thank you.

What do you think was most helpful in your child's recall of alphabet letters and sounds?

A) Jingles (i.e. "allergies, allergies, /a/- /a/-choo, bouncing ball, bouncing ball, /b/,/b/,/b/

B) Songs- (i.e. The Vowels Went on an Adventure, Slithering Snake)

C) Books read - (i.e. the Bus For Us)

D) Repetition - (i.e. drill, flashcards)

Did you sense that Center time (daily small groups with hands-on activities) was

A) Under stimulating
B) About right
C) Over stimulating

Was there evident Biblical integration throughout the language lessons?

A) Yes
B) No

Was the curriculum adequate for your child's academic level?

What part of the day did your child most often talk about?

Was there adequate recess time given?

Was there any weakness in the program, or something you'd like to see emphasized more?

Was the room arrangement conducive to your child's learning? Why or why not?

Approximately how much time per week do you spend working with your child educationally?

A) 0 –5 minutes daily
B) 6 – 15 minutes daily
C) 16 – 30 minutes daily
D) More than 30 minutes daily

What type of resources from school would be useful in helping your child progress in learning to read?

What additional resources have you used and found helpful in helping your child learn to read?

Any additional suggestions, comments, or ideas?

PARENTAL SURVEY RESPONSES

Parents, I would greatly appreciate your input on this survey for my graduate project. You may add comments on any answer. You may answer anonymously by returning this to the school office. Thank you.

What do you think was most helpful in your child's recall of alphabet letters and sounds?

A) Jingles (i.e. "allergies, allergies, /a/- /a/-choo, bouncing ball, /b/,/b/,/b/	67%
B) Songs- (i.e. The Vowels Went on an Adventure, Slithering Snake)	33%
C) Books read - (i.e. the Bus For Us)	11%
D) Repetition - (i.e. drill, flashcards)	0%

Did you sense that Center time (daily small groups with hands-on activities) was

A) Under stimulating	0%
B) About right	100%
C) Over stimulating	0%

Was there evident Biblical integration throughout the language lessons?

A) Yes	100%
B) No	

Was the curriculum adequate for your child's academic level?

Positive response	78%
Needed more challenge	22%

What part of the day did your child most often talk about?

Centers	56%
2nd Centers	11%
Story time	22%
Bible Stories	22%
Lunch	11%

Was there adequate recess time given?

Yes	78%
Desired more	22%

Was there any weakness in the program, or something you'd like to see emphasized more?

Tiered reading group /book check out

More concentrated reading

More homework

Was the room arrangement conducive to your child's learning? Why or why not?

Yes	100%

Movement good, organized, knew what to do, need more table space

Approximately how much time per week do you spend working with your child educationally?

A) 0 –5 minutes daily	0%
B) 6 – 15 minutes daily	44%
C) 16 – 30 minutes daily	44%
D) More than 30 minutes daily	11%

What type of resources from school would be useful in helping your child progress in learning to read?

Books from school sent home

Lending Library

Jingles sent home for parent use

Allow student to read to class

What additional resources have you used and found helpful in helping your child learn to read?

Explode the Code

Teach Your Child to Read

Leap Frog Videos Talking Letter/Word Fact

BOB books, Abeka Readers

Kumon

Workbooks

Any additional suggestions, comments, or ideas?