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Visual phonics : its impact as an instructional tool to promote literacy development in kindergarten students

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Visual Phonics: Its Impact as an Instructional Tool to Promote Literacy Development in Kindergarten Students

A Graduate Review

Submitted to the

Division of Early Childhood Education

Department of Curriculum and Instruction

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by

Lori J. Bower

May 2017

This Review by: Lori J. Bower

Titled: Visual Phonics: Its Impact as an Instructional Tool to Promote Literacy Development in Kindergarten

has been approved as meeting the research requirement for the

Degree of Master of Arts of Education.

5/8/17
Date Approved

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Abstract

This review of literature examined the impact of *See The Sound/Visual Phonics* (STS/VP), a supplemental instructional strategy, on kindergarten students, especially those at risk for future reading challenges. STS/VP is an instructional strategy originally designed for use with children who are deaf/hard of hearing, that utilizes the multi-sensory tool of gesture to focus on the development of phonemic awareness skills. Research reviewed for this study first examined the importance of phonemic awareness in overall literacy development. Additional studies reviewed establish support for the use of multi-sensory instructional approaches, including the specific use of gesture to help efficiently encode information. This review concludes with a variety of research that supports the use of STS/VP as an effective tool to promote letter-sound connections in both children who are deaf/hard of hearing and hearing students, especially those at risk for reading failure. Recommendations for the implementation of STS/VP to facilitate literacy development with kindergarten students are included, as are suggestions for future research. Connections to current educational practices and policies, including those at the national, state, and local levels, are also made. Findings of the review suggest that Visual Phonics is a low cost, easy to implement strategy that has the potential to positively impact the literacy development of many kindergarten students.

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CHAPTER 1

INTRODUCTION

Learning to read is one of the most critical goals for young children. It is the foundation upon which all other further learning often occurs. Research shows strong correlations between the development of strong early literacy skills and academic success in the primary school years and beyond (National Reading Panel, 2000; Snow, Burns, & Griffin, 1998). The ability to read is an essential skill that is required in almost all aspects of daily life. Following directions, taking medicine, sending a letter or e-mail, taking part in a religious service, reading road signs, or even ordering from a menu all require the ability to read in one way or another. Developing strong readers is one of the primary goals of early childhood educators (Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS, 2010; National Early Literacy Panel, 2008; National Reading Panel, 2000; Smith, Simmons, & Kame'enui, 1998; Snow et al., 1998).

Considerable time and research has been spent determining the necessary components of reading and identifying the best ways to promote literacy development in young children. The process of learning to read can be quite complex. It involves the acquisition of a variety of sequential sub-skills that children use in combination in order to develop into effective readers. There are five core areas of literacy that children need to develop in order to achieve reading success: phonemic awareness, phonics, vocabulary, fluency, and comprehension (Learning Point Associates, 2004).

When focusing on literacy instruction in early childhood, the National Reading Panel (2000) identifies phonemic awareness as the first core area of focus. Every word is made up of a combination of individual units of sound, called phonemes. The English language has 44-45

phonemes and are represented by the 26 letters, either individually, as with consonant and vowel sounds, or in combination, such as digraphs and diphthongs (International Communication Learning Institute, 2011). Phonemic awareness is the ability to hear, identify, and manipulate these individual units of sound (Learning Point Associates, 2004). It is the most fundamental skill children need to acquire when learning to read.

As an early childhood educator, I am constantly trying to improve my literacy instruction. Learning achieved during the early years is likely to be sustained throughout the elementary school years and beyond (National Reading Panel, 2000; Snow et al., 1998). In an attempt to provide our youngest learners with the best advantages possible, teachers need to work to incorporate essential instructional practices that both promote the core areas of literacy and are vital to reading development (Hoover, 2009; Invernizzi & Tortorelli, 2013; Learning Point Associates, 2004; National Early Literacy Panel, 2008; Smith et al.,1998). *See The Sound/Visual Phonics* (STS/VP) is a multi-sensory strategy involving the use of hand cues that focuses on the individual phonemes of the English language. By utilizing STS/VP in their language arts instruction, teachers can support the phonemic development of their students and thus, promote their students' overall literacy development.

Description of See The Sound/Visual Phonics

Visual Phonics, as described in an article by Montgomery (2008), was created more than 40 years ago by a mother who wanted to give her deaf child access, through visual, written, and tactile forms, to the sounds he could not hear. In 1982, the International Communication Learning Institute (ICLI) was formed with the mission of teaching "all people to learn to read and speak using See the Sound - Visual Phonics" (International Communication Learning

Institute, 2011). The ICLI is currently the sole source for information regarding training in the implementation of STS/VP or how to actually become a STS/VP trainer.

Visual Phonics is a system of 46 hand cues and written symbols, representing the 45 agreed upon phonemes of the English language. The 46th symbol represents the silent /e/. These hand cues are related to the consonant sounds, vowel sounds, digraphs, diphthongs, and r-controlled vowels represented by the 26 letters of the English language. "It is somewhat of a simplified, visual, kinesthetic version of the International Phonetic Alphabet (IPA)" (International Communication Learning Institute, 2011). Each hand cue is associated in some way with the actual production of each particular sound. The kinesthetic motion of the cue is literally related to what is happening in the mouth when forming the sound. "For example, flicking the index finger off of the thumb emulates the release of the tongue from the alveolar ridge when producing /t/—the sound represented by the letter t" (Montgomery, 2008, p. 177). The written symbol itself is a represented drawing of the motion of the hand cue.

When implementing STS/VP, students are taught to use each of these hand cues, and/or the written symbols, whenever working with the individual phonemes. "Visual Phonics can be woven into any literacy activity where sound awareness or sound/letter connections are being taught or reinforced" (Montgomery, 2008, p. 178). The multi-sensory nature of the strategy is also supported by research as an effective mode of instruction (Galperin, 1969; Phillips & Feng, 2012; Sousa 2006).

STS/VP is not a standalone program, but one that can be used to supplement any type of literacy program. It is a flexible strategy and its use is not dependent on costly materials or lengthy trainings. STS/VP can be easily implemented across all learning environments and with virtually any curriculum. "Explicit instruction in Visual Phonics could provide support for print

awareness, encoding, alphabet knowledge, sound-letter correspondence, spelling, punctuation, abbreviations, acronyms, comprehension, fluency, written composition, and English semantics and syntax" (Woosley, Satterfield, & Roberson, 2006, p. 456).

Rationale for Using See The Sound/Visual Phonics as a Supplemental Literacy Strategy

Reading has been defined by Hoover (2009) as the ability to derive meaning from written language. It has also been said that reading provides the foundation for all future learning. The importance of learning to read cannot be understated. It is a skill that people use on a daily basis throughout their entire lives. The types of reading that people do and the purposes for reading can vary greatly. Reading allows one to gain knowledge. It is an essential tool for communication. In order to read a map, follow road signs, or even make a grocery list, one must have well developed reading skills. Underdeveloped literacy skills can create giant roadblocks for learners, not only during their school years, but throughout their lives.

According to the National Reading Panel Report, several decades of scientific research shows that there are five critical areas associated with effective reading instruction; phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Institute of Child Health and Human Development [NICHD], 2000). The first area, phonemic awareness, is the foundation upon which the remaining core areas build upon. It is sometimes referred to as a sub-category of phonics and has been defined as the ability to hear, identify, and manipulate the individual sounds, or phonemes, in spoken words. Before children can learn to read written print, they must become more aware of how the sounds in words work. They need to understand that words are made up of individual sounds, or phonemes, and then they must be able to connect those phonemes to written letters.

According to the National Institute for Literacy, one of the strongest and most consistent early predictors of later conventional literacy skills is the ability to manipulate the sounds of spoken language. Developing strong phonemic awareness skills, such as being able to break words apart into their smaller sound units, or phonemes, consistently leads to better overall literacy skills later on (National Early Literacy Panel, 2008). Children who struggle to identify the individual sounds and/or connect them with written letters have a high probability of future reading difficulties.

Because Visual Phonics is a tool that specifically focuses on the individual phonemes, it can have a direct and positive impact on the development of a child's phonemic awareness skills. The multi-sensory nature of STS/VP is supported by research that has demonstrated kinesthetic learning to be more effective than many traditional instructional approaches (Bara, Gentaz, & Cole, 2007; Collins Block, Parris, & Whitely, 2008; Phillips & Feng, 2012). The utilization of STS/VP in kindergarten and early childhood classrooms can facilitate children's overall literacy development by helping them gain the foundational skills needed to become effective readers, as well as writers.

Purpose of Review Results for Early Childhood Educators

Historically there has always been a strong emphasis on developing good foundational reading skills in kindergarten (Smith et al., 1998; Snow et al.,1998). Research supports the importance of developing strong phonemic awareness skills during the early childhood years (Hoover, 2009; Smith et al., 1998) and STS/VP is a strategy that specifically targets the phonemes and letter/sound connections. This review can assist the kindergarten and/or early childhood educator in understanding the positive benefits of developing strong phonemic awareness skills in young learners, how employing a multi-sensory approach to learning can be

more effective, and how the specific use of STS/VP can facilitate the development of effective early literacy skills.

Phonemic awareness development itself is a sequential process. Simpler skills, such as isolating phonemes and blending phonemes together, need to be mastered before more complex tasks such as deleting, adding, or substituting phonemes can be mastered (Learning Point Associates, 2004). This review describes to early childhood educators how STS/VP combines the benefits of a multi-sensory instructional tool with one that focuses specifically on the development of the letter-sound connections. This kinesthetic tool can then be utilized in the hierarchy of phonemic awareness tasks. As a result, this supports the use of STS/VP in the overall development of strong phonemic awareness skills in young learners that can then put them on the path to becoming effective readers and writers.

Terminology

Alphabetic principle - Understanding that letters and letter patterns represent the sounds of spoken language. There is a systematic and predictable relationship between written letters and sounds that are spoken out loud. The National Early Literacy Panel (2008) refers to the alphabetic principle as knowing the names and sounds associated with printed letters. This can also be referred to as sound mapping.

Deaf/Hard of Hearing - The term deaf is usually used to refer to an individual with very little or no functional hearing and who often uses sign language to communicate. Hard of hearing refers to an individual who has a mild-to-moderate hearing loss who may communicate through sign language, spoken language, or both.

Gesture - A form of non-verbal communication in which hand and/or body motions communicate a particular message, either in place of, or in conjunction with, speech. Novack,

Goldin-Meadow, and Woodward (2105) define and differentiate between different types of gesture. Iconic gesture is a visual representation of referential material and believed to be, by the authors, the best type of gesture to help communicate ideas to learners. Deictic gestures are also described as pointing gestures. Conventional gestures refers to movements such as head nods.

Haptic - Any form of interaction that involves the sense of touch.

Kinesthetic - In regards to learning, the word kinesthetic refers to any learning that involves physical movement. Collins Block, Parris, and Whiteley (2008) described kinesthetic movements being added to instruction as a second learning input system.

Materialization - Galperin (1969) defines materialization as the use of tangible objects and physical actions to represent a concept or strategy while in the process of internalizing the mental action. Materialization helps to direct a child's focus to the critical aspect of the concept or strategy that is to be learned.

Multi-sensory - In regards to education, multi-sensory refers to involving multiple sensory systems in the learning process. Research done by Phillips and Feng (2010) utilized auditory, visual, and kinesthetic interactions in a multi-sensory approach designed to improve sight word recognition in kindergartners.

Phonemes - A unit of sound. The National Early Literacy Panel (2008) refers to phonemes as the smallest unit of sound that can change the meanings of spoken words.

Phonemic awareness - "The understanding that spoken words are made up of separate units of sound that are blended together when words are pronounced" (Learning Point Associates, 2004, p. 4).

Phonological awareness - A broad term that encompasses a general awareness of our spoken language, including the ability to orally recognize word features such as the initial sound

of a word (onset), the ending part of a word (rime), and patterns among words, along with recognizing elements of a sentence and syllables (Learning Point Associates, 2004).

Visual Phonics - "A multi-sensory strategy that represents all of the sounds of English with a hand shape cue and a corresponding written symbol. It is not a program or a curriculum, but rather a strategy for representing sound in a visible, concrete way" (Montgomery, 2008, p. 177).

Research Questions

This literature review will examine the effects phonemic awareness has on early literacy skills. It will also explore how the strategy of STS/VP, which was originally designed to support the understanding of phonemes and phonemic development in deaf/hard of hearing children, can impact that same development in non-hard of hearing children in early childhood programs. The review was designed to answer the following questions:

1. How can the visual phonics strategy be used to supplement literacy instruction in kindergarten?

2. What impact does the use of visual phonics have on at-risk kindergarteners in the area of literacy development?

CHAPTER 2

LITERATURE REVIEW

It is easily recognized and agreed upon in classrooms and schools throughout the United States and around the world that the development of strong literacy skills is an essential goal for all students (Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS, 2010; National Early Literacy Panel, 2008; National Reading Panel, 2000; Snow et al., 1998). A considerable amount of research has taken place over the years to determine the necessary components involved in learning to read. Research has also focused on the best instructional strategies and programs to use in order to promote the skills needed at each and every stage of literacy development (Hoover, 2009; Invernizzi & Tortorelli, 2013; Learning Point Associates, 2004; National Early Literacy Panel, 2008).

According to the National Reading Panel (2000) the areas of phonemic awareness, phonics, vocabulary, fluency, and comprehension are essential to the development of quality literacy skills. These areas should be the focus of academic instruction in early childhood and elementary classrooms. In order to lay the foundation for literacy development, the core area of phonemic awareness proves to be a good starting point and thus should be a primary focus for early childhood educators (Learning Point Associates, 2004; National Early Literacy Panel, 2008; Snow et al., 1998).

When it comes to phonemic awareness, there are numerous programs, strategies, and tools designed to facilitate the development of these skills (National Early Literacy Panel, 2008; National Reading Panel, 2000; Snow et al., 1998). For the purposes of this review, I am focusing on the instructional strategy of *See The Sound/Visual Phonics* (STS/VP). This literature review is designed to address the following questions:

1. How can the visual phonics strategy be used to supplement literacy instruction in kindergarten?

2. What impact does the use of visual phonics have on at-risk kindergarteners in the area of literacy development?

In order to fully understand the importance a strategy such as *See The Sound/Visual Phonics* (STS/VP) can have on the literacy development of young children, one must first understand the purpose of STS/VP and then be able to relate that purpose to one or more of the essential components of reading development. The goal of STS/VP is to help children be able to identify the individual phonemes and relate them to their corresponding written letters, which is essentially the definition of phonemic awareness. This literature review begins by using research to demonstrate the importance of developing strong phonemic awareness skills. Because STS/VP is a multi-sensory tool that utilizes hand gestures, research that supports multi-sensory instructional strategies in general, as well as the more specific use of gestures, is reviewed next. This review concludes with research directly regarding STS/VP and its use with both deaf/hard of hearing children (which was its original target population) and non-disabled children in early childhood classrooms, including those at risk for reading failure.

Phonemic Awareness

When it comes to making links between early literacy and later developing literacy skills, the National Early Literacy Panel (2008) determined that some early literacy skills are more important than others. They consider phonemic awareness to be one of the strongest and most consistent predictors of later reading success. Knowing the names of printed letters, knowing the sounds associated with the letters, and being able to manipulate those sounds successfully provide the foundation for later reading proficiency.

Catts, Fey, Zhang, and Tomblin conducted research to determine which factors predict future reading challenges and successes in young children (Catts, Fey, Zhang, & Tomblin, 2001). They studied over 600 children during their kindergarten year and then followed up with those same children when they were in second grade. Of those kindergarten students, 328 had language impairments, cognitive impairments, or a combination of language and cognitive impairments. Between May and November of their kindergarten year, the children in the study were given a battery of assessments. The assessments included a conventional test of language abilities, a measure of narrative abilities, and measures of phonological awareness, rapid automatized naming, letter identification, and nonverbal cognitive abilities. Approximately two years later, a reading comprehension assessment was given as a follow-up. The subjects were divided into four age ranges based on their ages at the time of assessment. Age-based and/or grade-based norms were used to analyze the results. One hundred eighty-three children from the study were identified as having reading difficulties in second grade. This higher than normal prevalence of reading difficulties was expected because of the disproportionate number of children with language and/or cognitive deficits present in the study. From the battery of assessments given, the results of the study showed that five of the variables assessed during kindergarten—awareness, letter identification, sentence imitation, rapid naming, and mother's level of education—were identified as being the most effective predictors of reading proficiency at second grade. Letter identification was a slightly stronger predictor than the rest, but all were shown to uniquely predict later reading ability. Catts et al. (2001) recommend using their assessment model to identify children at risk for reading challenges while they are still in kindergarten. According to the authors, once children are identified as being at risk, they should

be targeted for instruction that focuses on phonological awareness and sound-letter correspondences more directly than is typical in most classrooms (Catts, et al., 2001).

In another longitudinal study designed to identify predictors of future reading success, Hulme et al. (2002) assessed 72 children in Yorkshire and Cambridge, England. The subjects were assessed twice, first during their kindergarten school year, when the children ranged in age from 5.14 to 6.34 years, and then again anywhere from seven to fourteen months later. Children's reading abilities were initially assessed using both the British Ability Scale-II and the British Picture Vocabulary Scale 2nd Edition. Additional tasks that involved sound detection, sound oddity, and sound deletion were also administered in order to determine children's sensitivity to four different levels of phonological awareness—onsets, rimes, initial, and final consonants. The British Ability Scale-II was used as the follow up assessment. The results of this study showed phonemic awareness to be the most powerful predictor of later reading ability. Further hierarchal regression analysis was done to determine how these results applied to more and less skilled reader groups. Again, phonemic awareness, particularly awareness of initial phonemes in cluster onsets, were the best concurrent predictors of future reading skill. The authors of this study surmised that the age of the participants was an important factor in these results. They hypothesized that if this study was extended to younger children, around the age of four, then onset-rime, which is an easier skill, might be a better predictor of later reading development. Hulme and colleagues suggest that when working with kindergarten children, phoneme awareness should be the primary focus of instruction (Hulme, et al., 2002).

Snider (1997) conducted a two part longitudinal study to examine the relationship between phonemic awareness and later reading development. Seventy-three kindergarten students from a rural district participated in the initial study. They were given a general test of

phonemic awareness skills which consisted of five subtests representing a variety of phonemic awareness tasks, including both easier skills such as rhyme tasks and more challenging skills such as phonemic segmentation. At the end of second grade, follow up assessments of the Iowa Test of Basic Skills (ITBS) and the California Achievement Test (CAT) were conducted with 50 of the original participants to determine their reading abilities. Movement of students out of the district and retention were the primary reasons for the reduced number of participants in the follow up. Data collected both initially and during the follow up were analyzed using a series of stepwise regressions in order to determine how well each subtest skill predicted later reading achievement. Results showed that phonemic segmentation (where children identify each phoneme in a word), strip initial consonant tasks (where children were required to delete the initial phoneme of a word and then read the remaining word), and substitute initial consonant tasks (where children identify the initial sound of a word and replace it with a different sound to create a new word) were highly predictive of later reading abilities. Results also showed that 18 children who took part in the initial assessments scored in the lower quartile overall during kindergarten. Only eight of those same students participated in the second-grade testing, however. This limitation of the initial study prompted Snider to conduct a follow up study, thus extending her research. She was able to locate four additional students who initially scored in the lower quartile. Follow up assessments, which included the original tests of phonemic awareness and the Gray Oral Reading Inventory, were used at the end of third grade to assess the reading skills of those initial 12 low scoring students. Results showed that only three of the 12 were considered to be proficient decoders at the end of their third-grade school year, thus supporting the earlier results that phonemic awareness skills in kindergarten can predict later reading successes/challenges (Snider, 1997).

Knowing that phonemic awareness is such a strong predictor of later reading success, it is important to ask if intervening with instructional strategies that specifically target phoneme development can positively impact children otherwise at risk for reading failure. Hatcher, Hulme, and Snowling (2004) conducted a study to address that very question. They began by assessing over 400 children from 20 different preschool classrooms in the United Kingdom. The median age at the start of the study was 4.65 years. Subjects were initially assessed with a large battery of tests measuring receptive vocabulary and non-verbal ability, letter identification, reading, spelling, arithmetic, language, memory span, speech rate, and phonological skills. Based on these assessment results they were then evenly distributed according to abilities into four groups. Children at risk for future reading failure were specifically identified. Each group was randomly assigned to one of three teaching programs: reading curriculum with an additional focus on rhyme, reading with an additional focus on phonemes, or reading with an additional focus on both rhyme and phonemes. The fourth group became the control group and only received the basic reading curriculum. Throughout the next two years all students in the study were taught basic reading instruction in like ways. In addition, the students in the three intervention groups received additional training in their group's designated area(s). This instruction was administered in 10-minute sessions, with groups of 10-15 children, three times a week (children in the control group spent that additional time in reading instruction). At the end of the research period subjects were assessed again. The median age at the end of the study was 6.93 years. Results showed enhanced performances for all children who received additional training focused on phoneme skills, both those identified as at risk and those who were not. The at-risk students showed some of the largest gains. When making comparisons amongst the at-risk subjects from all four groups, the students who received the reading instruction with the

additional focus on phonemes were the first group to reverse their decline in skills. This occurred during their second year of school. For at-risk children in the rhyme only group, their decline was not halted until their third year. One of the primary implications of this study is the fact that it is possible to identify children at risk for future reading failure and that targeted interventions can halt the decline of performance for children. The authors also argue that the sooner children are identified and interventions begin, the better it will be for their overall literacy development (Hatcher, Hulme, & Snowling, 2004).

Multi-Sensory Instructional Approaches

Current research supports using multi-sensory approaches to learning in order to connect with different parts of the brain and thus, improve learning. Information that the brain receives visually through sight is stored differently than information received from the other sensory systems like the auditory system (hearing), the olfactory system (smell), or the tactile system (touch). When more senses are involved in learning the information, it means that more of the brain is involved in storing the information. As a result, when the time comes to retrieve information from the memory, the brain is able to access it more easily as well (Christie, 2000; Jensen, 1998; Shams & Seitz, 2008; Sousa, 2006). In addition, multi-sensory instructional approaches tend to increase student engagement, as well as make learning more enjoyable (Baines, 2008). When combined, all of these factors have the potential to maximize student learning.

In 2012, Phillips and Feng presented a paper at the Annual Conference of the Georgia Educational Research Association in Savannah, GA. They conducted action research with a class of 21 kindergartners in order to determine if there was a difference between the use of a traditional flashcard method and a multi-sensory approach on the achievement of Dolch sight

word recognition. A total of 15 students were allowed to participate in the study. The class involved in the study had a high percentage of economically disadvantaged students. Half the participants were taught five Dolch sight words using the traditional flash card method for two weeks and half were taught five Dolch sight words using a multi-sensory approach, which included things like sky writing and chopping words along the arm, for two weeks. Pre- and post-tests were conducted to assess each child's knowledge of the five Dolch sight words. In addition, at the end of the two weeks a survey was given to all participants asking how well they enjoyed learning the sight words. Post-test scores from the multi-sensory approach revealed that there was substantial and statistically significant growth when compared with the flash card method of instruction. Results from the survey questions showed the multi-sensory approach of learning Dolch sight words was the preferred method of instruction. The authors caution against the limited size of this study. They also point out that the active nature of the multi-sensory approach can, in itself, increase student focus and, as a result, lead to an increase in learning (Phillips & Feng, 2012). Many would consider this to be another added benefit of the multi-sensory instructional approach.

A multi-modal approach was also explored by Pieretti, Kaul, Zarchy, and O'Hanlon (2015) in an action research study involving two preschoolers with severely unintelligible speech. Their articulation skills were initially assessed using the Arizona Articulation Proficiency Scale-Third Edition (AAPS-3). In addition, phonological awareness was assessed using the Phonological Awareness Literacy Screening-PreK (PALS-PreK) and receptive vocabulary was assessed with the Peabody Picture Vocabulary Test-Third Edition (PPVT-III). Each participant received 30-minute therapy sessions twice a week for a total of 20 sessions. The first four sessions consisted of language-based activities with no articulation therapy. The next

four sessions included traditional articulation therapy with auditory/verbal and visual presentations. The following eight sessions utilized a program called FONEMZ, which incorporated auditory, tactile, and kinesthetic approaches. The final four sessions had the same instruction as the initial four sessions. Following each session the two subjects were assessed on their target phonemes as well as some non-target phonemes. At the conclusion of the study the AAPS-3 and the PALS-PreK were re-administered. Both participants moved from a diagnostic category of "severe deficiency in articulation" to a category of "Moderate deficiency in articulation." Both participants demonstrated an upward trend in the accurate production of phonemes once the FONEMZ program was utilized, which might suggest that the multi-modal approach was the most effective, but it could also be the cumulative result of all the interventions. Not only did the multi-modal approach directly improve their articulation skills, but their phonemic awareness skills were positively impacted as well. Both subjects showed an improvement on the follow-up PALS-PreK assessment. Specifically, significant increases were demonstrated in the area of beginning sound awareness. Once again these authors caution against the very limited sample size of this study (Pieretti, Kaul, Zarchy, & O'Hanlon, 2015).

Knowing that multi-sensory approaches tend to be more effective and allow for more student engagement (Baines, 2008; Christie, 2000; Jensen, 1998; Shams & Seitz, 2008; Sousa, 2006), how do approaches that target specific senses impact learning? Bara, Gentaz, and Cole (2007) and Labat, Ecalle, Baldy, and Magnan (2014) each conducted studies that focused on the use of haptics with early literacy instruction. Haptics relates to any form of interaction that involves the sense of touch. Bara et al. (2007) studied 132 French kindergarteners from low-income families. Because of their socio-economic status, they were considered to be at risk for future reading challenges. Half of the group received letter/sound instruction through haptic and

visual exploration (HVAM). This group was considered the experimental group. The other half received instruction through visual exploration only (VAM) and was considered the control group. Data were collected pre and post intervention on letter recognition, rhyme identification, phoneme identification, and pseudo-word decoding. ANOVAs performed on the data showed that letter recognition and initial phoneme identification improved more after HVAM training than after VAM training. A delayed effect of improved pseudo-word decoding scores from the HVAM group was evident after the students entered first grade. The authors attribute this to the fact that low income children tend to have less developed language skills and limited vocabulary (Bara et al., 2007). A similar study conducted by Labat et al. (2014) involved 72 at-risk kindergarten students in France. Subjects were assigned to one of four instructional groups: visual (V; audio-visual exploration), visuo-haptic (VH; auditory, visual, and haptic exploration), visuo-graphomotor (VG; auditory, visual, and grapho-motor exploration), and a control group (C). Baseline data were also collected to determine if children had a high or low skill level in regards to letters and sounds. The three experimental groups were taught letter-sound correspondences for two vowels and two consonants while the control group did not perform any activities related to letter learning. The children were tested individually before and after each training sessions on two tasks: letter-sound knowledge and letter writing. Again ANOVAs were used to analyze the data and results found that the percentages of gain were significantly greater in the V, VH and VG groups than in the C group. Low-skilled children specifically showed higher gains with the VH and VG instructional approaches, suggesting that the addition of haptic and graphomotor exploration enhances the acquisition of phoneme development in at-risk kindergarteners (Labat, Ecalle, Baldy, & Magnan, 2014).

An additional multi-sensory study by Collins Block, Parris, and Whiteley (2008) studied the effects of adding kinesthetic movements to literacy instruction. Over 500 students from grades K-4, with low socio-economic backgrounds, participated in the study. Subjects were divided into two instructional groups. One group received traditional reading comprehension instruction and the other group incorporated a Comprehension Process Motion (CPM) strategy. The CPM strategy utilized a series of hand gestures designed to increase reading comprehension skills. All students received small-group instruction outside of their regular classroom for 45 minutes daily for 60 school days. Data were collected through both standardized assessments and criterion referenced tools. Subjects from the experimental group significantly outperformed control subjects on five explicit comprehension processes, with students from the K-2 population showing the greatest gains. The younger students also showed better retention of skills over time. This suggests that hand movements help to make abstract images and concepts more concrete, and as a result, enhance overall learning (Collins Block et al., 2008).

The Impact of Gesture on Instruction and Learning

While STS/VP is considered to be a multi-sensory strategy, it essentially relies on the kinesthetic movement categorized as gesture. What does research say about the effectiveness of gesture when used as an instructional strategy?

The effects of gesture have been studied in many different ways. Cook, Yip, and Goldin-Meadow (2010) conducted a series of four studies to determine what, if any, effect gesture had with college-aged students on memory recall. In the first three studies the participants were shown a series of animated vignettes depicting spatial movements and actions of objects, animals, and people. They were then asked to recall what they had seen. In the final study they were shown still pictures instead. In the first study, 17 participants watched the videos with no

specific directions presented. Following the viewings a distractor was given in the form of a questionnaire. They were then asked to recall the vignettes on three separate occasions- directly following the questionnaire (immediate recall), a short time later, after viewing a still picture (cued recall), and then again after three weeks (delayed recall). Participants' gestures and spoken responses were recorded and coded by two independent coders. It was found that when the participants used gesture while watching the vignettes or during the immediate recall, their recall at later times was significantly better. The subsequent studies followed the same format, but with the manipulation of various conditions. In the second study, the 48 participants were divided into two groups. One group was instructed to gesture and one group was instructed to keep their hands still. In the third study, the vignettes were changed to depict everyday actions people do with their hands, such as clapping. The 41 participants were again divided into two groups, a gesture group and a no gesture group. In the final study, still pictures were used instead of vignettes. The 15 participants were again divided into two groups as in the second and third studies. This complex series of studies produced several results. In studies 1, 2, and 4 the participants who utilized gestures, either spontaneously or per the direction of the study, demonstrated improved recall, both immediately and after a delay. In the third study there was no reliable effect between the two groups, though the authors surmised that "watching someone perform an action may, on its own, activate motor representations" (Cook, Yip, & Goldin-Meadow, 2010, p. 472), and thus improve recall. It was suggested by the authors that the motor coding involved with gesturing helps to efficiently encode that information into the brain. Overall the results of this study indicate that gesture performed while encoding information leads to better memory recall. In addition, when that gesture accompanies speech, the speech itself becomes a more effective tool for remembering (Cook et al., 2010).

Prior to the study with undergraduate students, Cook and Goldin-Meadow (2006) conducted gesture research with 49 fourth grade students from low-income and middle-income families. The participants received individual instruction using one of five varying instructional conditions: Speech alone, no copying instructions; Speech alone, child instructed to copy speech; Speech + Gesture, no copying instructions; Speech + Gesture, child instructed to copy speech; and Speech + Gesture, child instructed to copy gesture. Children were randomly assigned to one of the five conditions prior to taking the pretest and each child was taught the same math equalizer strategy. Throughout the study, observers recorded each participant's use of gesture and speech, even those who were not instructed to copy any gestures or speech. ANOVAs of the data yielded several results. Children who saw gesture gestured more, and their gestures reflected the content of what they saw. Adding gesture to the lesson increased the children's production of the strategy in gesture. Finally, in each condition, children who utilized speech and gesture while performing the strategy during instruction, regardless if they were instructed to do so or not, solved more problems correctly than those who only utilized speech during instruction (Cook & Goldin-Meadow, 2006). The authors point out that it is impossible with this study to determine if gesture would impact learning if it occurred without speech, but they do feel the findings strongly suggest that gestures can play a causal role in knowledge change (Cook & Goldin-Meadow, 2006).

How does the understanding of gestures' impact on college students and upper-elementary children translate to younger learners? A study conducted by Demir, Levine, and Goldin-Meadow (2015) sought to determine if gesture could positively impact lower elementary students ability to develop narrative skill. Thirty-eight children were a part of this longitudinal study that lasted for three years. The children in this study were visited in their homes each year

between the ages of five and eight. At each visit they were shown a 3-minute, wordless Tom and Jerry cartoon and then asked to describe the cartoon to an examiner who had viewed the cartoon with them. All of their narratives were videotaped and their speech and gesture were coded. In addition, each child was given a syntax comprehension test in order to get a measure of basic oral language. At age 5, the children who produced gesture with their narratives did not differ in terms of their spoken retell when compared with the children who did not produce gesture. However, they did differ in the spoken narratives they gave at later ages. These results indicate that the production of "character-viewpoint gesture" at age five is a specific predictor of later narrative skill. It is worth noting that a significant limitation of this study, as identified by the authors, is that the study itself does not determine if the ability to produce a gesture related to the character's viewpoint is simply related to a child's ability to take another's perspective. If this is the case, then the use of gesture is merely a correlation and does not, in fact, show a causal relation to narrative development. Future work involving the manipulation of gestures when telling narratives is needed to address this question (Demir, Levine, & Goldin-Meadow, 2015). Regardless, the authors feel that encouraging children to both "tell" and "show what they have seen might enhance the development of narrative skill, thus improving both story production and story comprehension (Demir et al., 2015).

We have seen that gesture has the potential to be an effective tool for many age levels. Novack, Goldin-Meadow, and Woodward (2105) sought to determine just how early in life gesture can be utilized as an effective tool. Sixty-four 2- and 3-year-olds were selected to take part in a two part study of iconic gesture. Iconic gesture is a visual representation of referential material and believed to be, by the authors, the best type of gesture to help communicate ideas to learners. With iconic gesture the movements represent meaning that is closely related to the

content of the speech that they accompany, i.e. spreading hands far apart when describing something as being very wide. In the first part of the study, the participants were divided into two groups, a control group and an experimental group. During the study, each participant sat on their parent's lap across from an examiner and a variety of toys (two practice toys and eight experimental toys). The examiner began with the two practice toys in order to demonstrate that all the toys "do something." Next the examiner presented each of the experimental toys. Children in the control group were simply handed each toy for exploration, as the examiner stated "Hmm, what does this thing do?" The same was done for children in the experimental group, but in addition, the examiner either included a gesture demonstration, where the examiner produced a gesture that represented how to act on the toy without actually touching the toy, or an incomplete-action demonstration, where the examiner actually touched the toy, but did not fully complete the action needed to achieve the desired outcome of the toy. The second part of the study was done with only the 2-year-olds. In this study, all of the children saw one set of toys with an iconic gesture demonstration, where hand movements were used to represent the actions needed to achieve the desired outcome with the toys, and one set of toys with a point gesture demonstration, which simply involved the use of pointing as a guide for instruction with the toys. Results from the first study showed that the 3-year-olds learned equally well from the iconic gesture demonstrations and the incomplete-action demonstrations, whereas the 2-year-olds did significantly better with the incomplete-action. One possible explanation for this, given by the authors, is that the physical contact on the object in the incomplete-action demonstration gave enough scaffolding for the 2-year-olds to understand the intended action. In the second study, the 2-year-olds only demonstrated success with the iconic gesture. The point gesture was completely ineffective. While these studies show that gesture can be an effective tool for children as young

as 2 and 3 years of age, future research is needed to determine the stages of development that occur in regards to gesture and understanding (Novack, Goldin-Meadow, & Woodward, 2105).

Visual Phonics Research

The specific focus of this review is the instructional strategy of *See The Sound/Visual Phonics* (STS/VP). This strategy was originally designed for use with the deaf/hard of hearing population. It was designed to help children with moderate to complete hearing loss have a greater understanding of the phonemes and develop their overall phonic awareness skills. Therefore, this section is divided into two parts. The first part reviews STS/VP research that specifically targets the deaf/hard of hearing population. Research involving hearing students, including those at risk for reading failure, is presented in the second part.

Deaf/Hard of Hearing Population

Trezek, Wang, Woods, Gampp, and Paul (2007) conducted a study with 27 kindergarten and first grade students with varying degrees of hearing loss. Ten of the students had cochlear implants. All participants were taught using the same phonics-based curriculum along with STS/VP as a supplement for an entire year. Standardized assessments measuring sentence writing phoneme, sentence writing spelling, phonemic awareness segmentation, phonemic awareness deletion, phonics onsets, and phonics rimes were administered as both pre- and post-tests. Informal anecdotal notes were also collected throughout the study. When comparing pretest and posttest measures, results showed that each cohort of students had higher mean score upon completion of the study (Trezek, Wang, Woods, Gampp, & Paul, 2007). In addition, all students obtained scores that would indicate an average performance on all assessment measures. This is significant, because children who are deaf/hard of hearing typically show delays in these early reading areas when compared to same age hearing peers. It was also reported, through the

anecdotal notes, that students independently used the STS/VP cues to practice their spelling flashcards and they continued to utilize the STS/VP cues even outside of the designated instructional times related to the study. It was suggested by the authors that future studies should include a larger sample size as well as a control group for comparison. The teachers in the study reported that the use of the VP cueing allowed them to teach phonics much more effectively to their deaf/hard of hearing students (Trezek et al., 2007).

In a single participant case study, Smith and Wang (2010) sought to determine the effects VP could have on a 4-year-old boy with a significant hearing loss and a cochlear implant. This child came from a Spanish speaking home and his family knew very little sign language. His language level was the equivalent of an 18-month-old. Intervention sessions occurred 4 days a week, 15-20 minutes per day, for a 6-week period and utilized a standard kindergarten phonics curriculum with VP cues as a supplement. Comparisons between pre- and posttest data showed that the boy made significant improvement in his phonological awareness skills and his production of speech. In addition, he demonstrated a transfer of learning by applying his new knowledge to whole-class phonics instruction (Smith & Wang, 2010).

Hearing and/or At-Risk Population

It is important to note that because STS/VP was created just over 40 years ago for use with deaf/hard of hearing children, there is a limited amount of published research on its use with the hearing population. One of the earliest studies done with hearing students was conducted by Slauson and Carrier (1992), a resource teacher and a kindergarten teacher. Their action research was designed to compare the achievement of kindergarten students who received supplemental STS/VP instruction with students who did not. The 18 children in the morning kindergarten section at their school in Loveland, Colorado were assigned to be the experimental group and

received STS/VP along with their regular literacy curriculum. The 20 children in the afternoon section served as the control group and only received instruction in the regular literacy curriculum. It was decided that two additional children would receive intensive support, which included STS/VP, in the resource room, and their results were reported separately. A pretest that consisted of naming letters, sounds, and blended nonsense sounds/words was given in September to both determine each child's baseline knowledge and group children in the study into one of three categories- slow, typical, or advanced. In March, those same skills were then assessed in the form of a posttest. In addition, the Word Attack Subtest of the Woodcock-Johnson Revised Assessment was also administered at the same time. Because there was a disproportionate amount of advanced students in the STS/VP group, whole class comparisons were not made. Instead, results were analyzed and compared according to the ability groupings. In the area of letter recognition, typical and advanced students showed similar gains. Slower students in the STS/VP group showed only slightly greater gains than those in the control group, but not enough to be considered statistically significant. Results of the letter sound assessments showed similar results with the typical and advanced participants. However, slower children in the STS/VP group showed significant gains over those in the control group, recognizing almost twice as many sounds as their peers that did not receive any instruction in STS/VP. The two children who received intensive resource instruction, which included the VP hand cues, also made significant gains in the area of letter sounds. They were 3 times more successful than the slower peers in the control group on the posttest of that skill. In the area of nonsense words, advanced students in both groups made similar gains. Typical students in the STS/VP group made significant gains over the typical students in the control group. None of the slower participants in either group reached the level of blending sounds in order to read words by the time of the post-testing. These

results led the authors to determine that the inclusion of STS/VP with existing literacy curriculums has the potential to accelerate reading development for both slow and typical learners. They also suggest that the introduction of STS/VP does not have any negative impact on advanced learners and that it can be implemented along with an existing curriculum without intruding upon or diminishing it. They argue that STS/VP has the potential to broaden literacy programs already in place in both regular education and resource or special education classrooms (Slauson & Carrier, 1992).

Two of the most prominent studies to date were done by a group of authors with at-risk kindergarten students. In 2008, Cihon, Gardner, Morrison, and Paul completed a study where they identified five students most at risk for reading failure in a kindergarten classroom. Once the students were identified using data from the DIBELS assessment, they received small group VP instruction for 10-12 minutes, three times a week, for eight weeks at the end of the kindergarten school year. Upon completion of the intervention period all students in the class were assessed using the DIBELS instrument. Children from the study were also assessed with a curriculum based measure (CBM) specific to the target sounds worked on during the intervention. Results showed that the study participants performed similarly to their benchmark peers on the DIBELS. As evidenced by their performance on the CBM, they showed significant gains on the sounds targeted by the intervention (Cihon, Gardner, Morrison, and Paul, 2008). Then in 2013, Gardner, Cihon, Morrison, and Paul conducted a similar study with six students identified from a single kindergarten classroom as being at risk. Throughout the study, each participant received individual STS/VP instruction for the sounds they could not master with the regular language arts curriculum. Some letters were taught using the hand cue only (uncoded instruction) and some were taught using the hand cue along with the written symbol (coded instruction). DIBELS

was again used as a pre- and posttest assessment for all students in the class. CBM measures were used to assess the target sounds taught to the participants. At the end of the study, all six students demonstrated improvement on the DIBELS, with some doing well enough to transition to a less restrictive categorization on several DIBELS subtest. In addition, when using the hand sign with the written symbols (coded condition), the six participants mastered a total of 11 letter-sound relations. When using the hand sign only (uncoded condition), they gained 22 letter-sound relations (Gardner, Cihon, Morrison, and Paul, 2013). The small sample sizes and lack of follow up to check for long term effects are obvious limitations of both studies and could easily be addressed in future research. Regardless, the authors point out that STS/VP can have a positive impact on at-risk students and that its low cost and ease of use make it an easy and cost effective intervention to implement (Cihon et al., 2008; Gardner et al., 2013).

While the amount of published research on the use of STS/VP with hearing children is limited, there are several unpublished research papers on studies conducted where STS/VP has been used as a supplement to literacy instruction with hearing children. Studies have been conducted with both children who are at risk of reading failure and with regular education students in general.

Basbagill (2010) conducted her master's research with fourth grade students who were identified as below grade level in reading. Four students from the same classroom were identified as participants in this study. Over a period of ten weeks, students were trained in four sounds - /ue/, /ow/, /ai,/, and /wr/. Training sessions were held two or three days a week and each session lasted between 15-20 minutes. Data were gathered both pre- and posttest in a variety of ways. The Woodcock Reading Mastery Test Revised (WRMT-R) and DIBELS were used as standardized assessments. Curriculum Based Assessments including sounds in isolation,

sounds embedded in single words, generalization of target sounds within sentences, and maintenance of previously mastered sounds were also administered. In addition, a questionnaire was given to both the classroom teacher and the participants in the study. Each student in the study reached mastery on the Curriculum Based Assessments on the target sounds. Results on the WRMT-R showed that all four students made significant gains on letter-sound identification, with two of the students bringing sub-tests up to grade level. Overall gains on the DIBELS assessment were not observed, but this could be explained by the fact that the DIBELS assessment includes reading passages that do not necessarily include any of the words or sounds taught in the intervention. Both the teacher and students gave very positive feedback on the questionnaires. The teacher reported an increase in letter-sound relations among the participants and the students shared that the hand cues were easy and fun to learn and they expressed a desire to learn more (Basbagill, 2010).

Two studies conducted with first graders (Haarstad, 2010; Knox & Krupke, 2015) sought to determine the effect STS/VP can have with decoding skills. STS/VP was used as a supplemental strategy with 20 students in a first grade classroom in an intervention period lasting from September through January (Haarstad, 2010). Pre- and posttest data were collected using the Yopp-Singer phonemic segmentation assessment and a general phonemic awareness assessment. Additional posttest data were collected using the Aims Web fluency probes and a parent survey was also completed at the end of the intervention period. In January, the class average as a whole rose 10 points above the expected level of 48 sounds in the assessment in nonsense words. Results of the Aims Web oral reading probes showed that 90% of the students reached or exceeded the benchmark on the timed probes (Haarstad, 2010). Parents reported that

their children were transferring the use of VP hand cues by utilizing them at home when trying to sound out words (Haarstad, 2010).

Knox and Krupke (2015) studied 42 first graders from two different classrooms. Both classrooms received similar literacy instruction based on the Macmillan Treasures series, but one class was taught by a teacher trained in STS/VP and utilized VP hand cues as a supplemental strategy (experimental group) and the other class did not receive any STS/VP instruction (control group). It was determined, with school input, to use the spelling curriculum as the basis of progress monitoring during this study. At the conclusion of the study, the children in the experimental group had a higher percentage of first try accuracy than those in the control group, regardless of gender or assigned literacy group (Knox & Krupke, 2015). The authors of both studies point out that there are limitations to their respective studies. Sample size and allowing for differences in teaching style are just some of the areas that need to be addressed. Even with these limitations, both authors suggest that there is enough evidence that STS/VP is an effective supplemental tool for literacy instruction (Haarstad, 2010; Knox & Krupke, 2015).

In a study focused on younger children, Gergits (2010) conducted research with 25 preschoolers, ages three-five, identified with speech/language impairments, to determine the effect, if any, STS/VP could have on their emerging phonological skills. The students in this study were assigned to one of three groups- a phonological awareness group (PA), a phonological awareness supplemented by visual phonics (PA+VP), and a no intervention group. Children met in groups of 2-3 for 20 minutes, 2 days per week for 10 weeks. The Phonological Awareness and Literacy Screening-Pre-Kindergarten (PALS-PreK) tool was utilized to determine each subjects' emerging literacy skills both pre- and posttest. Upon conclusion of the intervention period, results showed that the students in the PA+VP group on average scored

higher on phonological skills at the syllable level than those in the PA and control groups. It is important to point out the small sample size, as well as the wide range of ages and language abilities present in this study are definite limitations and could easily impact results. Even so, the results demonstrate that preschoolers with speech/language impairments, on average, benefit from phonological interventions supplemented with STS/VP (Gergits, 2010).

In a research survey study conducted in 2011, Narr and Cawthon unitized an online survey instrument to collect feedback on STS/VP from teachers formally trained in the strategy. Responses from 200 participants, including special education teachers, regular education teachers, deaf educators, reading specialists, SLPs, and interpreters, were used for analysis in this study. Participants with years of experience ranging from one to two years to more than 10 years answered both multiple choice and open ended questions on the use and effectiveness of STS/VP. Analysis of the survey responses demonstrates that teachers feel STS/VP is an effective tool for improving students' phonemic awareness skills, decoding skills, and word recognizing ability. Open-ended question responses show that teachers overwhelmingly support the use of STS/VP with their students. They commented about the fact that STS/VP is relatively easy to be trained in and requires very little materials and/or cost to implement. Teachers also stated that the hand cues can be easily incorporated into any existing literacy curriculum. The combination of all these factors supports the use of STS/VP to help further literacy development with young students across all educational settings. (Narr & Cawthon, 2011).

Summary of Findings

The purpose of this review was to determine the impact, if any, STS/VP can have on literacy instruction in kindergarten, especially with those who are at risk in the area of literacy development. The organization of the review included research on components of STS/VP, such

as phonemic awareness and multi-sensory learning, as well as research specific to the strategy of Visual Phonics itself.

The purpose of Visual Phonics is to help children focus on and identify the individual phonemes, as well as establish letter-sound connections, which is an essential part of phonemic awareness. Therefore, the first step in this review was to determine the importance, if any, of developing phonemic awareness skills in young learners. Several of the studies reviewed showed phonemic awareness to be a strong predictor of future reading skills (Catts et al., 2001; Hulme et al., 2002; Snider, 1997). A study conducted by Hatcher et al. (2004) showed that instructional practices which focused on phonemic awareness positively supported young children specifically at risk for future reading failure.

STS/VP is a multi-sensory strategy that relies on kinesthetic hand movements. Therefore, research supporting the benefits of multi-sensory instructional approaches were reviewed next. Bara et al. (2007), Collins Block, et al. (2008), Labat et al. (2014), Phillips & Feng (2012), and Pieretti et al. (2015) all conducted studies where multi-sensory strategies had positive impacts on student outcomes. The specific use of gesture, which is the multi-sensory approach that most closely resembles the visual hand cues utilized in STS/VP, was the subject of several studies reviewed next. The use of gesture when encoding information leads to better memory recall, as evidenced by the results of studies done by Cook and Goldin-Meadow (2006), Cook et al. (2010), and Demir et al. (2015). Novack et al. (2105) determined that children as young as two and three years old can benefit from the use of gesture.

Visual Phonics was originally designed for use with children who are deaf/hard of hearing. Its benefits with this population were studied by Smith and Wang (2010) and Trezek et

al. (2007). In both studies, children with varying degrees of hearing loss benefitted from the use of STS/VP in the development of their phonemic awareness skills.

This review concluded with research studies, both published and unpublished, that focused on hearing learners. It was demonstrated through research by Basbagill (2010), Cihon et al. (2008), Gardner et al. (2013), Gergits (2010), Haarstad (2010), Knox and Krupke (2015), and Slauson and Carrier (1992) that children who are at risk for future reading challenges benefitted the most from the addition of the STS/VP strategy. It also benefited typically developing children. At the same time, Visual Phonics use was not shown to impede the development of advanced learners. In a survey study conducted by Narr and Cawthon (2011) educators utilizing STS/VP overwhelmingly supported the use of the strategy with students with a variety of educational needs and in all types of educational settings. They reported Visual Phonics to be an easy to use, cost effective tool that positively supports the development of phonemic awareness skills in young learners.

This literature review has provided strong evidence that phonemic awareness is an essential skill that needs to be addressed in order to develop strong readers. It has also been shown that multi-sensory instructional strategies, and specifically those that incorporate the use of gesture, are very effective. Overall, the research reviewed here supports the use of *See The Sound/Visual Phonics* (STS/VP), an instructional strategy that utilizes the multi-sensory tool of gesture to focus on the development of phonemic awareness skills, as an effective instructional strategy to use with all students, including those at risk for reading failure, in kindergarten classrooms.

CHAPTER 3

CONCLUSION

The purpose of this review is to study the impact *See The Sound/Visual Phonics* (STS/VP) can have on the development of phonemic awareness skills with kindergarten students, including those at risk for reading failure. The review discusses the importance of phonemic awareness in the overall development of strong literacy skills. It also reviews research that supports the use of multi-sensory instructional approaches. Specifically, multiple articles from this section support the use of gesture when encoding information. Results from these studies show that gesture use can positively impact learning and memory recall. It concludes with a variety of research supporting the use of STS/VP in multiple settings with various populations, including children who are deaf/hard of hearing as well as hearing students who may or may not be at risk of future reading challenges.

This chapter provides a brief summary of the research studies along with their findings. It includes my synthesized insights; recommendations based on the research findings; potential focus for future studies; implications for VP use to support and meet educational polices and expectations at the local, state, and national level; and suggestions for VP use to support literacy development for myself and other early childhood educators.

Conclusions

See The Sound/Visual Phonics is a valuable tool to use to supplement literacy instruction and promote the development of phonemic awareness in young learners. The primary focus of VP is to aid children in establishing a solid letter-sound connection. This foundation is necessary in order for children to develop into strong readers. When children understand the alphabetic principle, knowing that letters and letter patterns represent the sounds of spoken language, they

are better equipped to encode and decode the letters and words of our written language. This ultimately leads them to becoming better readers and writers.

The kinesthetic nature of VP makes it an effective tool to use with young learners. The underlying reasoning behind this belief is that it gives the brain more inputs with which to process information. The VP hand cues operate like the multi-sensory tool of gesture. Research reviewed here has shown that gesture, when used during the encoding of information, can lead to greater memory recall. Once children have associated the hand cues with the letter sounds, the physical act of using the cues will cause them to think about those sounds and their corresponding letters. Likewise, seeing the written form of a letter will trigger the brain to make the hand cue and aid in the recall of producing the correct sound or sounds. This overall process of VP use helps to strengthen the foundational reading skill of phonemic awareness in young learners.

With regard to my research questions, the results of this review support the use of VP as an effective supplemental literacy tool in kindergarten. It has shown that VP use can positively impact the development of phonemic awareness skills in kindergarten-aged children. This review also supports VP use with kindergarten children specifically at risk in the area of early literacy development. Children who are struggling with phonemic awareness skills can take advantage of the added benefits of gesture when using VP to improve their memory recall when learning letters and sounds.

Insights Identified and Synthesized

Various studies (Catts et al., 2001; Hatcher et al., 2004; Hulme et al., 2002; Snider, 1997) demonstrate the importance of focusing on phonemic awareness during literacy instruction with young learners. Research shows that phonemic awareness is one of the foundational skills

necessary for developing strong readers. Before children can learn to read they need to understand how sounds work. They need to have "the understanding that spoken words are made up of separate units of sound that are blended together when words are pronounced" (Learning Point Associates, 2004, p.4). Children need to be able to hear, identify, and manipulate those different sounds. In addition, phonemic awareness has also proven to be a strong predictor of future reading success or challenges. Both Catts et al. (2001) and Hulme et al. (2002) conducted longitudinal studies that demonstrated phonemic awareness, particularly awareness of initial phonemes in cluster onsets, to be one of the best predictors of future reading skill.

While countless instructional programs and strategies exist to teach phonemic awareness, not all of them include the use of multi-sensory experiences. Research by Bara et al. (2007), Collins Block et al. (2008), Labat et al. (2014), Phillips and Feng (2012), and Pieretti et al. (2015) support the use of multi-sensory learning approaches. Incorporating multiple senses during instruction through the use of visual, auditory, haptic, or any type of kinesthetic movement have all been shown to have a positive impact on learning. The hypothesis behind these approaches is that utilizing different types of brain inputs increases the channels with which the brain has to process information. Teachers who incorporate multi-sensory instructional approaches also report a higher level of student engagement. Studies done specifically on the use of gesture show that its use when encoding information leads to greater memory recall (Cook & Goldin-Meadow, 2006; Cook et al., 2010; Demir et al., 2015; Novack et al., 2105).

A variety of studies have been done on the use of STS/VP with various populations, including students who are deaf/hard of hearing and hearing students at risk (Basbagill, 2010; Cihon et al., 2008; Gardner et al., 2013; Gergits, 2010; Haarstad, 2010; Knox & Krupke, 2015; Narr & Cawthon, 2011; Smith & Wang, 2010; Trezek et al., 2007). The findings of these

research studies support the use of STS/VP to enhance the literacy development of students of all ages and developmental levels. On average, the students in the studies who utilized VP showed an increase in their phonemic awareness skills, as evidenced by their scores on both standardized tests and curriculum based measures. Teachers who utilized the strategy reported its ease of use and its ability to be implemented without any additional materials needed as added benefits, making it a low cost, easy to use instructional tool.

Recommendations

This review of research about STS/VP leads me to share the following recommendations to guide early childhood educators, beginning with the need to focus on phonemic awareness skills when planning literacy instruction. As a first recommendation, early childhood educators should make phonemic awareness a priority. Learning to read is a complex process that relies on the development of a set of sequential skills. Children have to be able to hear and identify the various sounds of spoken language. Then they can move on to making those letter-sound connections. This then allows them to begin encoding and decoding written language, thus laying the foundation for future reading and writing skills.

A second recommendation focuses on instructional approaches used in early childhood. Research from this review supports the use of multi-sensory teaching strategies and tools, regardless of the content knowledge being addressed or the desired outcome. Whenever learners can incorporate multiple senses, they are sending information to the brain in multiple ways. By utilizing auditory, visual, haptic, and/or kinesthetic modes, students can increase the chances of information being stored in the brain. Multi-sensory approaches also tend to be more engaging and fun for learners. The added enjoyment can also impact learning (Baines, 2008).

A third and final recommendation is that teachers should utilize the strategy of Visual Phonics hand cues to support literacy instruction with young learners. Its use is widely supported by the research reviewed here. *See The Sound/Visual Phonics*, and other tools similar in nature, have the potential to positively impact the development of young children's phonemic awareness skills, the importance of which has already been established. The use of VP hand cues is the equivalent of the effective multi-sensory tool referred to as gesture. When used during the encoding of information, gesture can improve memory recall. By utilizing a hand cue with a letter and sound, teachers are helping children to better encode the alphabetic principle. Because the only materials teachers need for VP is their hands, it is easy to implement with any existing curriculum or even during on the go, teachable moments. Teachers who utilize VP in their classrooms report that it is a low cost and easy to implement teaching tool. They report it is a strategy that effectively promotes the overall phonemic awareness development of their students (Narr & Cawthon, 2011).

Future Projects/Research

The original purpose of STS/VP was to help children who are deaf/hard of hearing have a greater understanding of the phonemes, develop their overall phonemic awareness skills, and ultimately improve their reading, spelling, and communication skills. The bulk of published research on VP naturally involves the impact its use has with the deaf/hard of hearing population, since that was its intended population. There is limited research available on its use with the hearing students. Currently, there are several unpublished studies of action research done with hearing children, but they vary greatly in the makeup of participants and the overall focus of each study. Clearly there is a need for more research with the hearing population in general and with students at risk for future reading failure.

Many of the studies I located for this review involved very limited sample sizes, often a single class group or smaller. Several were done without control groups for comparison. They also tended to occur for a time period equivalent to less than a school year. A longitudinal study with a large sample size that includes both experimental and control groups would provide great feedback on the impact STS/VP might have with young children who may or may not be at risk for future reading challenges.

Visual Phonics Use in Relation to Current Educational Practices and Polices

Over the past several years, early childhood education teachers have experienced the ever-increasing pressure of having a more academic focus in our kindergarten and preschool classrooms. The politicians and policy makers at both the state and national levels continue to raise the bar, especially in the area of literacy. Standardized assessments such as the Formative Assessment System for Teachers (FAST) and Individual Growth and Development Indicators (IGDIs) in Iowa have higher benchmark levels than tests administered even 10 years ago (Iowa Department of Education, 2016).

There is currently a strong focus on literacy development at all levels of education, from local school districts all the way up to the state and federal Departments of Education. Many school districts devote a large portion of their professional development time to improving literacy instruction in the hopes of developing stronger readers and raising test scores. At the state level, additional dollars have been made available to help schools that struggle with literacy instruction, as evidenced by their students' test score. The U.S Department of Education has produced several large-scale reports in recent years, including one by the National Reading Panel in 2000 and the National Early Literacy Panel in 2008, with the specific purpose of improving literacy instruction in classrooms across the country.

Now, more than ever, teachers need to have effective strategies in their arsenal of learning tools that can help their students develop strong early literacy skills. STS/VP is a great choice for that arsenal. Its kinesthetic nature makes it a fun and engaging tool to use with young children. At the same time it helps them build strong letter-sound connections. For teachers, it is a low cost, easy to implement strategy that has the potential to positively impact the literacy development of every child in their classroom.

Teacher Practices of Self and Others

Throughout this review, the importance of developing strong phonemic awareness skills during the early years was very evident. It was also apparent that the use of STS/VP could positively impact the development of those skills when used in early childhood classrooms. Because there are numerous tools and programs designed to improve phonemic awareness skills available to teachers, it is important to establish and understand the reasons why STS/VP is a worthwhile tool for educators to use.

The primary materials needed when implementing VP with students is the teacher's hands. This fact allows VP to be added to virtually any lesson, at any time, and in any place. In an article written by Krupke (n.d.), the author states that teachers should constantly ask themselves if what they are doing in any lesson, activity, or unplanned moment can provide an opportunity to connect letters and sounds. If the answer is yes, then there is also the opportunity to include VP, and thus help children develop and strengthen their phonemic awareness skills. VP is a tool that can be at a teacher's disposal any time an opportunity arises, not just during literacy instruction. During calendar time, students can identify the letters in the name of the month and/or the day of the week by saying them out loud along with VP hand cues. At sharing time, the teacher can ask what sound the leader's name starts with and students can answer with

a hand cue. While waiting in the hallway, the teacher can spell consonant, vowel, consonant (CVC) words with hand cues and have the kids guess the words. Anytime teachers are making a letter-sound connection, VP can be embedded, making possibilities for utilization throughout the day. In the study conducted by Narr and Cawthon, (2011) teachers surveyed overwhelmingly referred to the ease of implementation as a definite benefit of VP use.

In that same study by Narr and Cawthon, (2011), the minimal training required and the low cost of STS/VP were cited as another big plus. Once trained, teachers are able to implement VP immediately in all the different ways referred to above. In addition, it is possible to mentor fellow teachers in VP when a formal training session is not readily available. The hand cues can easily be shared with colleagues during team meetings and/or PD time so more children can benefit from the addition of the VP strategy during literacy instruction.

Based on this review, and my own personal experiences with STS/VP, I strongly recommend its use with children in kindergarten classrooms and beyond. I personally have witnessed students in my own classroom where VP became the 'hook' that helped them overcome learning hurdles and begin to make those strong letter-sound connections. As an educator, any tool that effectively helps a child gain knowledge and understanding, is easy to implement, and is fun and engaging for students, is definitely worth using.

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