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PHONOLOGICAL AWARENESS AND READING ABILITY IN CHILDREN

by

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B.S., Southern Illinois University Carbondale, 1998

A Research Paper

Submitted in Partial Fulfillment of the Requirements for
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Introduction

Although learning to read is one of the most important skills a child must acquire during early elementary grades, this language-based task is difficult for many children to learn (Swank & Catts, 1994). Reading is a complex behavior that relies heavily on cognitive and linguistic aspects (Swank & Catts, 1994). Reading is a language-based skill and is highly dependent on an individual's language abilities; therefore without adequate language skills reading could not sufficiently develop (Gillon, 2000). Since English is a language that relies a great deal on grapheme-phoneme relationships, children need to have a strong phonological awareness structure in order to learn this correspondence and to be able to decode unfamiliar words, therefore children with phonological awareness deficits are more likely to demonstrate reading difficulties (Bird, Bishop & Freeman, 1995). Stuart and Coltheart (1998) determined that phonological awareness is most important during the initial years of reading instruction. They found that children with a strong grapheme-phoneme association had less difficulty learning to read (as cited in Bishop, Bird & Freeman, 1995). Because language based reading difficulties are within the scope of practice of speech language pathologists (SLPs) it is

crucial for clinicians to remain current with research in the area of reading deficits.

This research paper will examine the relationship between phonological awareness and an individual's ability to read. Through this literature review the following research questions will be addressed: (a) What is phonological awareness; (b) Is there a link between phonological awareness and reading ability; (c) What impact does explicit phonological awareness training have on reading ability; (d) What aspects of phonological awareness specifically need to be addressed in order to remediate reading; and lastly (e) What types of phonological awareness interventions are currently available and have been proven to be most effective?

What is Phonological Awareness?

According to Mattingly (1972) phonological awareness is considered an individual's metalinguistic ability to analyze sounds and sound structures of words (as cited by Schuele & Boudreau, 2008). Phonological awareness can be considered an umbrella term that encompasses a variety of skills including phonemic awareness which is considered an individual's ability to manipulate individual sounds or phonemes of a given language (Schuele & Boudreau, 2008). According to Kleeck, Gillam & McFadden (1998) "Phonemic

awareness is required for grasping the alphabetic principle, knowledge that words are composed of individual letters that in turn correspond to sounds within spoken words" (pg. 67).

Phonological Awareness and Reading Ability

Is there a link between phonological awareness and reading ability? The answer to this question has been continually addressed in the literature for many years. Reading achievement is considered the ability to comprehend and learn from written language (Torgesen, 1998). The ability to read is a necessary skill that all children need to possess in order to be successful in school as well as in their adult life (Moats, 2000, p. 4). If children are unsuccessful at reading they will unavoidably not obtain the full benefits of their educational experience (Moats, 2000, p. 4). Most people would agree that teaching children to read is the foremost responsibility of educators (Moats, 2000, p.3).

It has been widely demonstrated in research that phonological awareness significantly correlates with reading ability. Direct evidence of this claim will be established in review of the following studies.

In a longitudinal study of phonological processing and reading performed by Torgesen, Wagner and Rashotte (1994)

it was determined that children beginning first grade with deficits in phonological awareness skills will continually fall behind their peers in the areas of word recognition and decoding throughout elementary school (as cited by Schuele & Boudreau, 2008).

Catts (1993) studied the relationship between speech-language impairments, specifically phonological awareness deficits and reading disabilities. For this study Catts (1993) predicted first that language abilities of kindergarteners would be directly related to reading achievement in first and second grade. Second, Catts (1993) predicted that phonological awareness skills would more closely reflect the outcome of reading ability. This study began with participants in kindergarten and followed them through first and second grade. In order to obtain results for this research, both groups were assessed for phonological awareness ability in kindergarten and then for reading achievement in first and second grade (Catts, 1993). To assess the participants' phonological awareness abilities, deletion and blending task were administered. These specific tasks were chosen because of their ability to measure phoneme and syllable awareness (Catts, 1993). The participants' rapid automatic naming abilities were also assessed during this investigation since previous

research has shown a strong correlation between rapid automatic naming and word recognition skills (Catts, 1993). When the children entered first and second grade their reading ability was measured. Reading was assessed through word recognition, speed and accuracy of word recognition and comprehension tasks (Catts, 1993). The findings of this study indicated that the language impaired group of participants fell significantly below their peers in reading achievement (Catts, 1993). These results further support the relationship between language impairments and reduced reading ability. This research also reported that standardized measures of phonological awareness and rapid automatic naming abilities are strongly correlated with a child's reading ability in the second grade (Catts, 1993). Catts (1993) stated his research demonstrated "phonological awareness deficits lie near the core of reading disabilities in young children" (p. 955).

In another investigation performed by Swank and Catts (1994), the specific impact of phonological awareness on the decoding ability of first graders was examined. The intent of this investigation was to determine the effectiveness of measures of phonological awareness in predicting first grade decoding ability (Swank & Catts, 1994). Four phonological awareness tasks were used to

assess the students' ability. These four tasks were chosen because of their predictive relationship to later reading ability. The tasks included; deletion, categorization, blending and segmentation activities. Reading was assessed through word attack and word identification activities. Measures of phonological awareness at the onset of first grade were compared with decoding ability at the end of first grade. There were approximately six months between the administration of phonological awareness and the decoding measures (Swank & Catts, 1994). The results of this study indicate that measures of phonological awareness are strong predictors of decoding. It was determined in this study that the specific phonological awareness skill of deletion was the most effective measure in discriminating decoders (Swank & Catts, 1994). Swank and Catts, 1994 stated that this research is critical for early identification of deficient decoding and reading disabilities.

In a longitudinal study by Catts, Fey, Zhang & Tomblin (2001) kindergarten predictors of second-grade reading performance were examined. This study was designed to determine which measures of language were most useful in predicting future reading difficulties (Catts et al., 2001). The participants of this study included 604 children

assessed for phonological awareness, rapid automatized naming, letter identification, narrative abilities and nonverbal cognitive abilities. Follow up testing of reading performance was completed approximately two years after the kindergarten testing, from the testing results the participants were divided into two groups those with reading difficulties and those without (Catts et al., 2001). It was determined that 183 of the 604 participants had reading difficulties in second grade. The results of this investigation indicated that letter identification; sentence imitation, rapid naming and phonological awareness skills were the best predictors of later reading ability (Catts et al., 2001). The authors of this study state that these results validate the need for early identification methods and provide needed information to assist teachers and speech-language pathologist in making decisions regarding intervention for reading difficulties (Catts et al., 2001).

The findings of the above investigations demonstrate that phonological awareness is a strong predictor of later reading ability (Hogan, Catts & Little, 2005). This research provides an accurate way to identify children early on that are at risk for reading disabilities (Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Rose, E.,

Lindamood, P. L., & Conway, T., 1999). This information is particularly important for SLPs since they possess the needed skills to assess and interpret phonological awareness ability in children. It is imperative that SLPs collaborate with classroom teachers and reading specialists in order to identify phonological awareness deficits and to establish and implement the most effective treatment for children with reading disabilities (Hogan et al., 2005). With this wealth of information it is easy to see why one important focus of research in the area of reading disability has been to study the capability to remediate phonological awareness skills in order to improve reading performance (Torgesen, 2002). The next area of research that will be addressed is if providing phonological awareness intervention can improve a child's ability to read.

The Impact of Phonological Awareness Intervention on Reading Ability

Discoveries about the link between phonological awareness and reading ability are extremely important when it comes to the prevention and intervention of reading disabilities (Torgesen, Wagner, Rashoutte, Lindamood, Rose, Conway & Garvan, 1999). It was stated by Schuele and Boudreau (2008) that the critical purpose of phonological

awareness instruction or intervention is to assist in the acquisition of literacy, especially in the area of decoding words. Catts (1993) revealed that phonological awareness skills can be facilitated through direct instruction and therefore reading ability can be improved. Catt's research also indicates that reading instruction and intervention should specifically be developed to increase phonological awareness skills (Catts, 1993).

Several other studies have provided evidence that phonological awareness can be improved and therefore will lead to increased word decoding and reading ability (Schuele & Boudreau, 2008). The following information will discuss what has been gained from three studies that sought to determine the effectiveness of training phonological awareness to increase reading ability, particularly which elements are most important in a program in order for it to be the most effective.

Torgesen et al. (1999) studied the effects of four different instructional conditions for improving reading ability. All participants excluding the control group were given an extensive battery of pretests to assess their cognitive abilities and pre-reading skills. The participants in this study were randomly assigned to one of four instructional conditions 1) phonological awareness

with added synthetic phonics instruction (PASP) 2) embedded phonics (EP) 3) regular classroom support (RCS) and 4) a non-treatment group (NTC) (Torgesen et al., 1999). The participants in each group received one-to-one tutoring for twenty minutes a day, four days a week for two and a half years beginning in kindergarten. The findings of this study indicated that the most phonemically explicit group (PASP) performed significantly stronger on word level reading tasks than the other groups (Torgesen, et al., 1999). The authors of this study stated that their results suggest if provided with specific instructional conditions, it is possible for children with phonological weaknesses to acquire the necessary skills for reading (Torgesen et. al., 1999).

In another study by Gillon and Dodd (1995) the effects of training phonological and semantic-syntactic skills on the reading of ten to twelve year old students was investigated. The ten students that participated in this study were identified as having reading disabilities specifically in the areas of phonological, semantic and syntactic processing skills (Gillon & Dodd, 1995). All participants were assessed for intelligence and scored above average on the Test of Nonverbal Intelligence and the Peabody Picture Vocabulary Test-revised (Gillon & Dodd,

1995). The students participated in two training programs, the first provided explicit instruction in phonological processing skills and the second provided instruction in semantic-syntactic skills (Gillon & Dodd, 1995). The findings of this study suggest that phonological and semantic-syntactic deficits that cause reading disabilities can be successfully remediated (Gillon & Dodd, 1995). The data from this investigation also showed that specifically training phonological processing skills had the greatest impact on reading accuracy (Gillon & Dodd, 1995).

In a third study by Gillon (2000) the efficacy of a phonological intervention program was investigated. Gillon (2000) hypothesized that children provided with explicit phonological awareness intervention would make more gains in their reading ability when compared to children receiving traditional speech-language intervention and children receiving minimal intervention. Ninety-one children ages five to seven years participated in this study. The participants were placed in either a traditional speech-language intervention program that focused on improving articulation or language skills, an integrated phonological awareness program designed to improve awareness of the phonological structure of spoken language and to increase a conscious knowledge of grapheme-phoneme

correspondence, or in a minimal intervention control program (Gillon, 2000). All participants were assessed pre and post intervention to measure the following; speech production, reading ability and phonological awareness using a battery standardized assessments (Gillon, 2000). The results of this investigation indicated that an explicit phonological awareness program can significantly improve the reading accuracy and reading comprehension skills of children with language impairments (Gillon, 2000). The author's contribute the results to the following key principles that formed their phonological awareness intervention program; the intervention focused on development of skills at the phonemic level, phonological awareness activities were integrated with training grapheme-phoneme knowledge, particular attention was give to segmenting phonemes, a direct and intensive service delivery model was utilized and activities always included manipulative materials so the participants could engage in the phonological task (Gillon, 2000).

There is a strong consensus in the provided research that proves reading ability can be significantly improved through explicit phonological awareness intervention. Torgesen (2002) stated that programs that are phonemically explicit, intensive and provided as early as possible to

children struggling with reading will be the most beneficial for increasing phonological awareness. In the above mentioned studies the children that received the most phonologically explicit instruction at the most intensive intervals made the most improvement in word-level reading skills. These findings provide us with the pertinent information that is needed to develop valid and effective reading instruction or prevention programs that will improve reading ability (Torgesen et al., 1999). This research also provides a foundation for the next piece of information that will be discussed, in particular what types of phonological awareness interventions are available and what is their effectiveness on reading skills.

Types of Phonological Awareness Interventions and Their Effectiveness

Previous research has shown that programs which train phonological awareness have the ability to reduce early reading difficulties or to remediate reading disabilities (Catts, 1991). Torgesen (1999) stated that intensive phonological awareness instruction can bring below average word reading skills of children with reading disability into the average range. Without direct phonological awareness intervention student difficulties in this area will continue over time (Gillon & Dodd, 1995). Gillon and

Dodd (1995) also state that general reading and language stimulation activities that make up the regular classroom curriculum are not sufficient enough to remediate students that are deficient in reading (Gillon & Dodd, 1995).

Torgesen (1998) stressed the importance of providing an effective intervention program that includes the key elements of intensity, duration and unequivocal training in phonological awareness skills. Torgesen (2004) concluded that if intervention programs containing these critical elements were provided for all students in need, the incidence of early reading difficulties could be drastically reduced. It is clear that the importance of providing effective phonological awareness programs should be at the foremost thought of teachers and clinicians.

However, given the complexity of the reading process, no one intervention approach will be effective for all students with reading deficits (Gillon & Dodd, 1995).

Gillon and Dodd (1995) believe that it is the responsibility of teachers, reading specialists, and speech language pathologist to combine their knowledge of language and reading in order to choose the most effective program (Gillon & Dodd, 1995). Numerous studies discuss the types and effectiveness of phonological awareness programs. The studies presented below will review the findings related to

three different programs available today; in particular the attributes that make the programs most effective will be discussed.

In an investigation by Pokorni, Worthington & Jamison (2004) the effectiveness of three phonological awareness programs; Fast ForWord, Earobics and LiPS were explored. These programs were chosen for their focus on phonemic awareness and because of their developer's claims regarding drastic improvements in language and reading (Pokorni et al., 2004). The authors of this study sought to examine the following research questions; does one or more of the three intervention programs result in greater gains in phonemic awareness, language or reading skills and second did participants in individual groups make gains in phonemic awareness, language or reading related skills (Pokorni et al., 2004). The participants of this study consisted of sixty two students between the ages of seven and a half and nine years of age, who were currently receiving speech language services, all were reading more than one year below grade level and all scored more than one standard deviation lower than the mean on at least one of three pretests of language, however all had average intelligence scores (Pokorni et al., 2004). Before starting the intervention program all participants' phonemic awareness

and reading skills were assessed, then six to eight weeks post intervention those skills were reassessed (Pokorni et al., 2004). Participants were randomly assigned to one of the three intervention programs (Pokorni, et al., 2004). Each program was conducted during a 20 day summer program consisting of five hours of intervention a day for all participants (Pokorni et al., 2004). The findings of this study revealed that the LiPS program improved the participants' phonemic awareness significantly better than the Fast ForWord program; however the groups did not differ in their improvement in language or reading skills (Pokorni et al., 2004). The results also determined that significant gains in phonemic awareness skills were made in the Earobics and LiPS groups (Pokorni et al., 2004). Each of the programs in this study had two important characteristics in common: content and intensity, both of which have been associated with varying outcomes related to improving reading ability (Pokorni et al., 2004). The treatment used in this study provided participants with intensive direct application to key areas of literacy development; decoding phonemes and words (Pokorni et al., 2004). The authors of this study concluded that in order for a phonological awareness intervention program to provide significant gains in reading skills, it must be

intensive and include direct instruction and application of the following areas; phonological awareness, alphabetic recognition and word decoding. The authors stated that the LiPS program was the most appropriate program for providing instruction in these areas (Pokorni et al., 2004).

Torgesen, Wagner, Rashotte, Herron and Lindamood (2009) investigated the effectiveness of two computer-assisted phonological awareness programs. The programs included in this study were Read Write and Type (RWT) and The Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech (LiPS) (Torgesen et al., 2009). The programs included in this study were chosen because they provide explicit and systematic instruction in the critical areas of literacy including; phonemic awareness, phonemic decoding and text reading (Torgesen et al., 2009). This study was designed to investigate the following questions: 1) Are there reliable differences in instructional impact between the two programs?; 2) Do students receiving supplemental instruction programs demonstrate more rapid growth in early reading skills than students who do not receive instruction?; and 3) What proportion of students receiving the supplemental instruction remained considerably impaired in reading skills following the intervention? (Torgesen et al., 2009). The participants of

the study included 112 first graders that were determined at risk for reading disabilities (Torgesen et al., 2009). The participants were randomly assigned to one of three groups RWT, LiPS, or a control group (Torgesen et al., 2009). The control group only received standard classroom reading instruction provided solely by their classroom teacher throughout the study (Torgesen et al., 2009). The intervention phase of this study lasted for two school years, during this time the participants received four, fifty minute sessions per week outside of the regular scheduled reading instruction, this supplemental instruction was provided by teachers that were specially trained in each program (Torgesen et al., 2009). The computer activities for both programs were coupled with teacher led instruction (Torgesen et al., 2009). The participants were assessed once pretreatment and twice post treatment first at the end of each instructional year then again one year following instruction (Torgesen et al., 2009). A battery of standardized test were used to measure the participants phonological awareness, rapid naming, word-level reading measures, phonemic decoding accuracy and fluency, text reading, spelling, and verbal ability (Torgesen et al., 2009). The results of this investigation determined that reading outcomes for students who received

the LiPS intervention were slightly stronger than for students receiving the RWT intervention therefore the results were not considered statistically reliable enough to prove an instructional difference between the two programs (Torgesen et al., 2009). Students in the both intervention groups showed reliably significant differences in phonological awareness, rapid naming, phonemic decoding, word reading accuracy and fluency, spelling and reading comprehension post treatment (Torgesen et al., 2009). The authors attribute these gains to three important factors; first, the computer-based programs were presented as supplemental instruction to the students' classroom teacher-led reading curriculum, second each program addressed critical instructional needs for students with reading disabilities and third, teacher-led instruction was directly linked to additional computer instruction and direct application of skills taught (Torgesen et al., 2009).

Determining the effectiveness of intervention programs will allow SLPs, reading specialists and classroom teachers to make informed decisions when choosing an appropriate remediation or prevention program.

Given the vast amount of phonological awareness programs available, it is clear why a challenge would arise

when trying to choose the best program for students (Lance, Beverly, Evans & McCullough, 2003). The consensus drawn from the current research is there is not just one effective program that should be used but instead a set of standards that should be followed when creating and implementing a program that will facilitate phonological awareness skills and therefore improve reading.

Conclusion

As stated in the beginning of this paper phonological awareness has proven to be a strong predictor of later reading ability. This literature review examined the relationship between reading and phonological awareness. In particular the objective of this paper was to review current and past research of the following areas; what is phonological awareness? Next, is there a link between phonological awareness and reading ability? Consequently, what impact does explicit phonological awareness training have on reading ability and what aspects of phonological awareness specifically need to be addressed in order to remediate reading? Finally, what types of phonological awareness interventions are currently available and have been proven to be most effective?

Lance et al., 2003 stated:

“One of the biggest concerns among educators today is how to create a nation of proficient readers. Reading, the act of decoding written symbols for the purpose of making meaning, is one of the most difficult tasks young brains will undertake. The complexity of the task is increased when confounded by difficulty in learning the language, for any reason. It is this language-reading connection that has thrust SLPs into the murky waters of reading interventions. To truly have an impact on the literacy skills of children with reading disabilities, SLPs must know effective reading instruction methods that will enable them to help students manage curriculum demands.”

(pg.11)

The importance of phonological awareness and its effect on reading ability has proven to be an important area for both SLPs and educators alike. It is a critical area that should continue to be researched and studied by SLPs, educators and reading specialist in order for the content to evolve and improve. This is important so that the effectiveness of reading interventions can be enhanced and reading achievement can be obtained by all children regardless of their phonological awareness ability.

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