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Phonological Processing and Reading Skills In Children With Speech Disorders

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Abstract

Youngsters who have difficulties pronouncing words also have difficulties comprehending and manipulating word sounds. Even if kids grow better at speaking as they age, this may still have an impact on how effectively they learn to read. The present study employs library research or literature review, a method that entails the collection of data and information from a variety of library resources, including reference books, prior research findings, articles, notes, and pertinent journals pertaining to the subject under investigation. To find out more about this, researchers consult earlier research and library books. Phonological awareness is the ability to recognize, manipulate, and break down sounds in words. Even before they can read, children need to have this talent. There are several methods to test it, including examining word constituents, like by looking at parts of words, such as the beginning sound and the rest of the word.

Keywords : *Phonological; Processing; Speech Disorders.*

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INTRODUCTION

According to (Dodd, B. 2014), children who struggle to produce specific sounds may be diagnosed with a speech sound disorder (SSD). This might include a variety of issues, such as mispronouncing words or being difficult to understand. Children with SSD, even those for whom there is no obvious reason, are more likely to experience difficulties in the future while learning to read, particularly if their speech issues first arise when they are just beginning school and are having difficulty learning to read.

(Stackhouse, J., Goulandris, N., Snowling, M.J., & Nathan, L. 2004) Also said, school-age children frequently require simultaneous assistance with speech, language, and reading, making this a crucial concern for speech-language pathologists (SLPs). Dealing with school-age children, who frequently require simultaneous assistance with speech, language, and reading during treatment sessions. The goal of the research was to determine reading proficiency. Thus, regardless of a child's illness, assessing how well they process sounds in words may be a valuable tool for identifying children who struggle with reading.

This study tries to see if certain sound processing skills can help identify which kids with speech difficulties might have trouble reading. Data on reading difficulties among school-age children receiving speech treatment for speech impairments is currently lacking. This complicates the relationship between sound processing and reading, which is crucial for theory and practice. Although there is little data to determine who may require further reading assistance, some research indicates that children with speech issues at the beginning of school may find it more difficult to read. So far, there isn't much data on reading problems among school-age kids with speech difficulties who get speech therapy. This makes it hard to understand how sound processing connects to reading, which is important for both theory and practice. Some studies suggest that kids with speech problems when they start school might struggle more with reading, but there's not enough research to know for sure who will need extra help with reading. This study tries to see if certain sound processing skills can help identify which kids with speech difficulties might have trouble reading.

For example, although certain research indicates that children with speech and language disorders are more likely to struggle with reading, other research indicates that variations in reading

proficiency among school-age children with speech disorders may be more closely related to their capacity to comprehend sounds, independent of language proficiency. This is consistent with the theories of educators on how children learn to read, according to which proficient word recognition is a prerequisite for accurate word reading, which in turn facilitates comprehension of what is being read. Theories on how our brains interpret speech also explain the relationship between speech issues and trouble reading words, with speech problems being one indicator of a more serious problem with recognizing sounds, which has an impact on reading. In conclusion, it appears that children with speech disorders, whether or not they also have language disorders, are more likely to experience reading difficulties; however, the risk is greatest for children who have difficulty interpreting word sounds. (Sices, L., Freebairn, L., Hansen, A., & Lewis, B. 2007) Taylor, H.G.

METHODE OF RESEARCH

Researchers used library research for this study, which entails obtaining data from books, papers, journals, and other library resources that are relevant to the subject under investigation. To answer the research questions, this procedure is used methodically to gather, analyze, and draw findings utilizing certain techniques. Qualitative research methods are utilized in the study to comprehend natural occurrences. Here, the researcher serves as the primary instrument for gathering data using triangulation methods. When data analysis is done inductively, inferences are made based on patterns seen in the data.

RESEARCH OF RESULT

Word decoding: Links to phonological processing

Theories about how kids learn to read agree that being able to figure out written words mostly depends on how well they understand sounds in words. For instance, according to one theory, there are three main skills related to understanding sounds that are important for reading: knowing about sounds in words (phonological awareness), quickly naming things (rapid automatized naming), and remembering words for a short time (verbal short-term memory). This study looks at these three skills and checks if how well kids with speech sound disorder (SSD) do on these skills can show if they'll have trouble reading or not. (Tambyraja, S.R., Farquharson, K. & Justice, L.M. 2020)

Phonological awareness (PA)

PA is the study of word sounds, particularly phonemes, which are discrete sounds. It has to do with how effectively children decipher words when reading, and it appears that proficiency in PA improves reading comprehension. Even if their speech issues improve as they become older, children with speech sound disorder (SSD) typically experience greater difficulties with PA than children without this condition. Therefore, it's unclear how much difficulty with PA indicates whether or not a child will experience reading issues, even though many children with SSD struggle with it, and it has an impact on their reading ability.

Rapid automatized naming (RAN)

Rapid automatized naming (RAN) involves quickly retrieving and naming stored phonological information from long-term memory. It measures how fast children can name familiar items, like colors, objects, or letters. Slow RAN times are thought to show difficulty associating visual stimuli with phonological codes. While RAN is linked to word decoding in typically developing (TD) children, this connection might not be as clear in children with language impairment (LI) and/or speech sound disorder (SSD). Some studies suggest that RAN significantly contributes to decoding ability beyond phonological awareness (PA). However, other research found no group differences in RAN between children with SSD and TD children. Despite this, given RAN's importance for decoding in TD children and its relative intactness in children with SSD, RAN tasks might help identify which children with SSD could struggle with reading.

Verbal short-term memory (vSTM) refers to temporarily storing auditory information. It helps readers hold onto the sounds of decoded letters while decoding the rest of the word. Although vSTM is a separate phonological processing skill from PA and RAN, some studies suggest overlap between vSTM and PA. Children with SSD often have difficulties with vSTM tasks, as shown in both behavioral and neuroimaging studies.

In general, research indicates that children with SSD have weaker phonological processing skills compared to TD children. However, it's unclear if children with SSD who struggle with reading

have difficulties across all phonological processing skills or if specific skills are more closely linked to reading problems. Fewer studies have looked at reading difficulties among school-age children with SSD, who often have additional diagnoses. This is important for speech-language pathologists (SLPs) who face time and resource constraints in meeting the diverse needs of children on their caseloads. This study aims to determine how specific phonological processing skills can help identify children with SSD at risk of reading difficulties.

Overall, research generally indicates that children with SSD exhibit poorer phonological processing skills compared with TD children. However, there remain relatively limited data to determine whether children with SSD who experience reading difficulties demonstrate difficulties across all phonological processing skills, or if difficulties with one or more specific phonological processing skills may be particularly associated with poor reading skills. Even fewer studies have examined clinically representative samples to understand the rate of reading difficulties among school-age children who meet criteria for SSD, and are thus a heterogeneous group, as they may have additional diagnoses as well. This is an important clinical consideration, as SLPs often have time and resource constraints to meet the multiple needs of children on their caseloads. To that end, this study seeks to determine the extent to which specific phonological processing skills may be clinically useful for identifying children with SSD at risk of concomitant reading difficulties.

A multiple case study approach

Traditionally, researchers have used approaches that focus on variables to figure out which skills and traits are linked to reading ability in children with SSD. While helpful for finding important predictors of reading ability, these methods don't consider the differences among individuals in diverse groups. In this study, we take a different approach by focusing on the individual. We want to learn more about the most common types of difficulties with understanding sounds in words (phonological processing) in children with SSD, and how these difficulties might distinguish kids with SSD who struggle with reading from those who don't. One method we use is a multiple case study approach. This approach involves setting a standard (like being more than 1 standard deviation below the average) to see how many people have difficulties on certain tasks or to spot patterns of difficulties within a specific group. For example, in a study by Ramus et al., adults with dyslexia all had trouble with understanding sounds in words (phonological difficulties), but not all of them had issues with hearing, seeing, or movement. Another study by Carroll et al. used a multiple case study approach to see how many children with dyslexia had problems with reading, writing, and understanding sounds in words. They found that there wasn't one specific task that all poor readers struggled with, but instead, they had a range of difficulties. In this study, we use the multiple case study approach to learn more about how to tell apart children with SSD who have trouble reading from those who don't, based on their ability to understand sounds in words. (Carroll, J.M., Solity, J. & Shapiro, L.R. 2016).

Purpose of the current study

In summary, this study adds to the small but growing body of research focused on understanding the connections between speech-sound disorders (SSD), phonological processing, and reading. There's increasing evidence that school-age kids with SSD are more likely to have trouble reading, especially with decoding words. However, it's not clear if this risk is because of overall difficulties with understanding sounds in words or specific skills related to sound processing. Also, we're interested in whether having trouble with one or more sound processing skills relates to a child's overall risk of reading difficulties.

We aim to answer the following questions:

1. What percentage of kids with SSD struggle with phonological awareness (PA), rapid automatized naming (RAN), and/or verbal short-term memory (vSTM)? Are these percentages different for children classified as poor or good readers?
2. What percentage of kids in each reading group (poor readers, good readers) have difficulties in multiple areas, and are there specific difficulties that occur together more often in either or both groups?
3. How much do phonological processing difficulties contribute to reading problems in children with SSD when we take into account their language abilities?

DISCUSSION OF RESEARCH

Evidence suggests that speech sound disorders (SSD) often coincide with reading disability (RD) on various levels. Children with SSD commonly struggle with tasks involving understanding the sounds in words (phonological awareness). Because phonological processing plays a key role in learning to read, it's not surprising that children with SSD, or a history of it, often have difficulties with reading and spelling. The connection between SSD and RD is well-known, and there's growing evidence of a genetic link between them.

However, while there's considerable overlap between SSD and RD, they're not exactly the same. SSD is recognized to have different subtypes. One method to distinguish these subtypes is by looking at family history, although this approach has limitations. Also, the severity of the speech disorder itself might indicate a risk for literacy problems, but this link isn't always clear-cut.

Another factor to consider is the type of errors children with SSD make when speaking. Certain error patterns may indicate a higher likelihood of phonological awareness difficulties, which are crucial for reading. However, not all children with SSD struggle with learning to read. Identifying specific subsets of children with SSD who are at risk for RD is essential for both research and clinical purposes.

One potential marker for RD risk among children with SSD is if the speech problem persists beyond the age of school entry. However, this marker's usefulness is debatable, as it might be influenced by environmental factors and the effectiveness of interventions. Regarding auditory processing, its relationship with RD is still unclear. While some studies suggest a connection between reading ability and how individuals perceive speech sounds, the exact nature of this relationship remains controversial. Nonetheless, difficulties with speech perception and articulation may increase the risk of reading difficulties.

This study explores the predictive relationship between speech perception and phonological awareness abilities measured before kindergarten and reading skills assessed at the end of first grade.

Phonological Processing Skills in Children With SSD

There are several SSD subtypes, and each one has a unique set of potential reasons for speech problems. (a) Genetic speech delay; (b) speech delay linked to otitis media; (c) speech delay linked to psychosocial involvement; (d) speech distortion errors affecting sibilants such as /z/; and (e) speech distortion errors affecting /r/ are the subtypes of SSD proposed by Shriberg et al. (2010). Speech apraxia (i), dysarthria (g), and other motor speech disorders (h). Five kinds of SSD are proposed by Dodd et al. (2005): articulation disorder (a), inconsistent deviant phonological disorder (d), delayed phonological acquisition (b), consistent deviant phonological disorder (c), and other. There is some consensus across sub-type categorization systems regarding three main areas of difficulty: (a) speech mistake patterns that are thought to have a phonological or cognitive linguistic genesis; (b) single-sound speech problems that indicate a possible perceptual-articulatory deficiency; and (c) speech abnormalities resulting from motor speech issues to varying degrees. (Stackhouse, J., Goulandris, N., Snowling, M.J., & Nathan, L. 2004) It is common for children diagnosed with SSD to exhibit phonological processing issues, independent of whether the speech errors are linked to motor, perceptual-articulatory, or cognitive-linguistic speech disorders. Children from the ASHA Special Interest Groups 1–21: Two Views The assessment considerations for children with SSD whose speech patterns may affect verbal performance assessments are the main focus of these sections. They also go over the nature of the difficulty, offer advice on how to assess each area, interpret assessment results, and use the information to decide what interventions to implement. The fourth section provides recommendations for assessing phonological processing skills in multilingual children. Finally, the fifth section is a case study of the assessment process for a child with SSD and phonological processing difficulties.

Phonological Awareness The Nature of Phonological Awareness Difficulties

The capacity to recognize and work with the distinct sounds or syllables in spoken words is known as phonological awareness. Phonological awareness in preliterate children is associated with success in reading later on. Tests for phonological awareness can be conducted at phoneme, onset-rime, or syllable levels, among other levels. The constituents of a syllable include onset and rime. The onset comprises any consonants that come before the vowel, while the rime comprises the vowel (nucleus) plus any consonants that come before the vowel (coda). The start is fl, the rime is ins, and the coda is ps in the word flips. Recognizing the beginning or ending sounds of words, segmenting sounds or syllables, thyming, blending sounds or syllables together, eliding or removing sounds or

syllables, and recognizing words that begin or conclude with the same tone. Significantly, compared to syllable-level or rhyming tasks, phoneme awareness which is assessed through exercises like phoneme identification and deletion is more strongly associated with performance in subsequent reading. (Sices, L., Taylor, H.G., Freebairn, L., Hansen, A. & Lewis, B. 2007)

Phonological awareness is related to the quality

Many children with speech sound disorders (SSD) struggle with understanding the sounds in words, which suggests that their ability to produce speech sounds is related to their phonological awareness. Children who have difficulty with phonological awareness may benefit from targeted intervention to improve their speech sound production.

Those with unusual speech errors, like omitting initial consonants or substituting sounds, tend to perform worse on tests measuring phonological awareness and memory compared to children with more typical speech errors. Adolescents who make single-sound errors also tend to score lower on tests of phonological awareness and memory than children with typical speech development. Children with childhood apraxia of speech often face challenges with phonological awareness and may benefit from interventions targeting this area.

Assessing phonological processing skills in children with SSD can be tricky because many assessment tasks rely on spoken responses, which may be affected by the child's speech errors. However, accurate assessment of these skills is crucial since children with SSD are at increased risk of reading difficulties due to their phonological processing challenges.

This tutorial outlines recommended approaches for assessing phonological processing skills in children with SSD, divided into three sections: phonological awareness, phonological memory, and phonological retrieval. Phonological awareness and speech sound production accuracy are important predictors of future reading ability in children with SSD. Therefore, a comprehensive phonological assessment, including both phonological processing skills and speech sound production, is essential for planning personalized interventions.

Assessing Phonological Awareness in Children With SSD

Many standard phonological awareness tests aren't tailored for evaluating children with speech production challenges. In tasks requiring spoken responses, distinguishing between a surface-level speech error and an inaccurate phonological representation can be perplexing. Table 2 illustrates common phonological awareness assessment tasks and the complexities of scoring for children with SSD. For instance, if a child with word-final cluster reduction is asked to name a word rhyming with "jump" (/dʒʌmp/), and they say "dam," it's unclear if they intended "chimb" or "chonp." The clinician must probe further to ascertain if the child's response indicates poor rhyme awareness or consonant cluster reduction. Overall, scoring and interpreting phonological awareness assessments necessitate discerning whether speech sound production or phonological processing underlies specific incorrect responses.

One strategy for evaluating phonological awareness in children with SSD is selecting words containing sounds and structures the child can articulate accurately. For example, if a child struggles with velar sounds, the clinician would eschew words like "car" (/kɑr/) and opt for words like "fish" (/fɪʃ/) to gauge their phonological awareness. Nonetheless, a downside of this approach is that.

CONSLUCION

Children diagnosed with speech sound disorder (SSD) are those who struggle to produce specific sounds during speech. The type of issue these children have, the way they make mistakes when speaking, and the difficulty of understanding them varies greatly. According to recent research, children with SSD—even those without a known cause—are more likely to experience reading difficulties in the future, regardless of the reason behind these problems. Theories about how children learn to read support the notion that comprehension of word sounds is a prerequisite for learning to read.

Studies generally show that kids with SSD have a harder time with understanding sounds in words compared to other kids. But we still don't know for sure if all kids with SSD who struggle with reading have trouble with all sound understanding skills, or if they might just have trouble with specific ones. There hasn't been much research on how common reading difficulties are among school-age kids with SSD, who also might have other diagnoses. This is important for speech therapists because they often have limited time and resources to help kids with different needs. This

study tries to figure out if specific sound understanding skills can help speech therapists identify which kids with SSD might also have trouble reading.

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