

Historical Practices Of Phonological Role To Develop Reading Skills For English Language Learners With Dyslexia

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Abstract

Reading skills are a set of supporting components related to a person's capability to read, understand, interpret, and decode written texts. Developing reading skills improves the acquisition of other skills, such as listening, speaking, writing, vocabulary, grammatical structures, and spelling. Reading for students with dyslexia could be impacted by issues with phonological components. This study examines research that discusses the reading skills of students with surface and phonological dyslexia. This study examines dual route theory to prove that the route of lexical or non-lexical reading was the main cause of reading problems among dyslexic students. Specifically, the branches of this theory were examined to observe what methods allow educators and others to address the needs of students with surface and phonological dyslexia. This study explores the assessments enabling educators to test the effectiveness of instructional strategies for students with surface dyslexia and phonological dyslexia, namely, Abecedarian Reading Assessment and the Thrass Assessment, respectively.

Keywords Phonological dyslexia, Reading, Surface dyslexia.

Introduction

Learning to read is one of the basics of education. Reading is a supportive element for acquiring other skills in education. Reading is information processing, which involves changing print to discourse or print to meaning (Coltheart, 2007). Reading is an exceedingly complex undertaking that includes the quick coordination of visual, phonological, semantic, and linguistic processes (Plaut, 2007). The significant foundational knowledge for word reading is built up when children's vocabularies develop broadly and when letter names, phonological awareness, and ideas about print are found out (Ehri et al., 2014).

Brennan et al. (2022) refer that reading knowledge is greatly affected by problems in comprehension of the phonological component or the sound structure of language, that is, the lack of phonological awareness. Therefore, children with dyslexia have difficulties in spelling and reading accuracy owing to deficiencies in the phonological component of the language. Phonology plays a role in making the person able to work with sounds in spoken words. Phonological awareness is formed by making the individual understand that spoken words consist of sounds. Thus, phonological is crucial to developing reading knowledge in children with dyslexia, especially in the early stages of learning. Some researchers believe that phonological skills contribute to the readers' ability to read the words (Troia, 2014; Van Orden & Kloos, 2007); moreover, phonological awareness with remediation lessens the reading troubles of children with dyslexia (Ehri et al., 2014). The development of phonological awareness for six-year-old children with dyslexia parallels the acquisition of reading aptitudes in the first year of schooling (Shaywitz, 1996). Thus, this study will discuss the development of reading skills for younger students with surface and phonological dyslexia.

Definition Categories

Phonological

Phonology alludes to all the cognitive operations that depend on the phonological structure of language for

their execution, particularly what is connected with the recognition, comprehension, storage, retrieval, and production of linguistic codes (Mohanlal et al., 2014). The phonological processing deficiencies of poor readers indirectly compromise reading comprehension aptitudes through its impact on decoding abilities, fluent word recognition, and advancement in fluent reading, as defined by Troia (2014). Therefore, phonological processing is important in the execution of literacy proficiency abilities chiefly because alphabetic orthographies encode lexical passages pretty much at the phoneme level, the littlest fragment of a spoken language's phonological structure that signals significant contrasts between the words.

A phonological process is performed when recognizing a printed word. Starting readers of an alphabetic script depends mostly on phonological recoding, changing over the letters and letter strings into their related phonemes and then reassembling the sounds to articulate the word. According to Acha and Carreiras (2014), when a reader reads a printed word, the mental lexicon first encodes the visual orthographic input, the letters are identified, and their position is encoded across the string. Thus, the phonological calculation process is carried out according to the construction of the orthographic information. This method resembles the interconnected representational system found in the speaking and reading experience. Therefore, the phonological processing operation incorporates phonological awareness, the recovery of phonological information from the lexicon, and phonological coding in working memory. This processing has considerable significance in taking in alphabetical reading and, to some extent, non-alphabetic languages (Troia, 2014).

Dyslexia

Dyslexia is a problematic issue in grasping how to read and spell from an early age, regardless of having standard academic achievement in other areas of study. Dyslexia has been hypothesized to be brought about not by brain injury but rather by a congenital disability that

results in issues related to storing visual impressions of words (Vellution & Fletcher, 2007). Galaburda et al. (2006) state that dyslexia has been portrayed as an increase in abnormalities of brain development. Although many conditions could cause developmental reading issues in children with dyslexia, most children show fundamental and consistent insufficiencies in word identification, phonological (letter sound) decoding, and spelling (Vellutino et al., 2004).

Dyslexia has many different types, but the most common are phonological and surface dyslexia. Phonological dyslexia relates to disentangling and interfacing sounds with symbols (Wybrow & Richard Hanley, 2015). In other words, phonological dyslexia alludes to a pattern in which oral reading accuracy displays a critical and irregular lexicality effect, exceptionally poor execution in response to non-words. Thus, real words, regular and irregular, are unhindered because these can be read proficiently by the lexical routes. The way that phonological dyslexia patients sometimes create lexicalization blunders is assumed to mirror the patients' endeavor to read non-words through the lexical reading routes (Lambon Ralph & Patterson, 2007). Surface dyslexia refers to deficits in the oral reading of words with atypical mappings between spelling and sound and impairments in semantic memory on tests, such as picture naming and/or word-picture matching (Woollams et al., 2007). According to Lambon Ralph and Patterson (2007), surface dyslexic patients are generally inclined to make mistakes in reading aloud low-frequency and conflicting words. Conversely, reading regular and non-words is better or close to the normal limits. High-frequency irregular words are less influenced than their low-frequency partners even in their ordinary state; however, especially after damage, the effectiveness of the lexical route is tweaked by word frequency.

The Model

Students with dyslexia have challenges with reading skills, as mentioned previously. Readers need two reading routes while they read: the lexical route and the

non-lexical route. Given that children with dyslexia have brain abnormalities that can affect the lexical or non-lexical reading route, the dual route theory proves that children with dyslexia have problems in both lexical and non-lexical routes (Coltheart, 2007). According to Rapcsak et al. (2007), dual-route models are empirical assumptions about the cognitive construction of the information-processing system utilized for reading and spelling. Reading by the lexical route depends on initiating word-particular orthographic and phonological memory representations. The lexical route can process all familiar words, whether regular or irregular, concerning their letter-sound connections, but it fails with unfamiliar words or non-words because these components have no lexical representations. This type of reading of words with poor reading of non-words is found in some people whose reading has been weakened by abnormalities in the brain; it is called phonological dyslexia (Coltheart, 2007).

Rather than the entire word retrieval process utilized by the lexical route, the non-lexical route uses a sub-word-level system instead of sound-spelling correspondence rules (Marinelli et al., 2015). Rapcsak et al. (2007) indicates that the non-lexical route can prevail with non-words (e.g., plunt) and furthermore with regular words that entirely obey English phoneme-grapheme transformation rules (e.g., must), yet it cannot deliver a right reaction to irregular words that breach these rules (e.g., choir). Endeavors to read irregular words by the non-lexical route result in regularization blunders. According to Coltheart (2007), this type is found in some people whose reading has been weakened by abnormalities in the brain; it is called surface dyslexia. This is a great proof of a dual route origination of the reading system. Moreover, the reading disorder that concerns interpretation is called acquired dyslexia. Raman and Weekes (2005) refer that acquired dyslexia is a reading deficit that includes the production of semantic errors and an impairment in the ability to read non-words, in addition to being acquired due to brain abnormalities. The dual-route computational model can clarify all the processes of acquired reading disorders

discussed in English. Acquired dyslexia differs from developmental dyslexia, which refers to persistent impairment in the ability to develop practical reading skills or failure to achieve a typical level of reading ability, despite adequate instruction and intelligence, normal sensory abilities, and social and cultural opportunities (Démonet et al., 2004).

Moreover, Coltheart (2007) intends that children who are extremely poor at reading irregular words but reading regular words typical for their age have developmental surface dyslexia. Children exceptionally poor at reading non-words yet reading regular words and irregular words expected for their age have developmental phonological dyslexia. Challenges in learning only the lexical and only the non-lexical route can be observed; distinctive examples of developmental dyslexia are additionally great proof for the dual route model of reading.

The Relationship Between the Two Categories

In general, much research sees the close relationship between phonological and dyslexia. Ramus (2003) indicated that phonological deficits are prevalent in dyslexia. Shaywitz (1996) showed that phonological is connected with dyslexia because of a broad consensus that dyslexia originates from a deficit in phonological processing. Moreover, her study showed that phonological deficits are the most noteworthy and reliable cognitive marker in dyslexic children. Great phonological processing is key for solid reading and writing capacities. Linguistic processes related to word meaning, grammar, and discourse overall, underlying comprehension appears to be completely operational. However, their activity is hindered by the deficit in the lower-order capacity of phonological processing. According to Vellution and Fletcher (2007), proof demonstrates that most children with dyslexia have major issues in learning to map alphabetical symbols to sounds and gaining facility in phonological (letter sound) decoding. Deficiencies in lexical abilities, such as word identification and spelling, and inadequacies in related aptitudes, such as phonological awareness, are seen in

dyslexic children early in their reading advancement. Besides, poor readers tend to perform beneath ordinary readers on both speech (categorical) perception and production tasks, proving that dyslexic readers are hampered by feeble phonological. Most children with dyslexia demonstrate lower levels of phonological awareness than those of an even younger age have reached regarding reading level, showing that their phonological aptitudes are most likely to be a reason for their issues in reading (Ehri et al., 2014). Vellutino and Fletcher (2007) contend that dyslexia mirrors a fundamental phonological deficit. Preschool children at high risk of dyslexia show delayed language improvement and, upon school entry, have poorer letter awareness and phonological abilities than their peers. FMRI results based on comparisons of age-matched dyslexic children with reading-matched peers in a phonological awareness mission indicated a function of the dorsolateral prefrontal cortex in making intelligible phonological judgments (Mody & Christodoulou, 2014).

Regarding surface and phonological dyslexia, children have likewise been seen to vary in their performance in phonological awareness tests, which require the ability to segment syllables and phonemes in spoken words. Phonological awareness of phonological dyslexia is commonly poor; conversely, surface dyslexia regularly performs well on such tasks (Douklias et al., 2009). Moreover, children with surface dyslexia demonstrate patterns like people with phonological dyslexia in languages with transparent orthographies. Both types display relentless yet exact sounding out as a default methodology when reading (Ehri et al., 2014). Phonological dyslexia is characterized by specific troubles with phonological processing in correlation with orthographic ability, whereas surface dyslexia is the inverse and includes pronounced orthographic difficulties in connection to phonological aptitudes (Wolff, 2009). Lambon Ralph and Patterson (2007) pointed out that surface dyslexia patients are especially prone to mistakes in reading aloud low-frequency and inconsistent words. Their errors compare to the more typical articulation for the orthographic components

within the word. In conventional dual route records of reading, surface dyslexia is thought to mirror an impairment of lexical reading; the most typical interpretation is that it comes about because of damage to the orthographic input lexicon itself. High-frequency irregular words are less influenced than their low-frequency counterparts even in their typical state; yet, especially after damage, the productivity of the lexical route is regulated by word frequency. Reading regular words and non-words is altogether better for surface dyslexia. Although phonological dyslexia reflects damage to grapheme-phoneme conversion (GPC), non-words cannot be read effectively because these orthographic strings must be changed into phonological representations by using GPC rules. Real words, regular and irregular, are unhindered because they can be read effectively by the lexical routes. In conventional dual-route reading records, phonological dyslexia is thought to mirror a weakness of non-lexical reading (Coltheart, 2007).

Vellutino and Fletcher (2007) mentioned that children with phonological dyslexia have issues with the operation of the phonological route, while those with surface dyslexia experience issues with the visual-orthographic route. Thus, phonological dyslexia indicates a poor reading of pseudowords over exception words, whereas surface dyslexia demonstrates better pseudoword over exception word reading.

Instructional Implications

As shown in the previous section, phonological reading skills affect children with phonological dyslexia more than those with surface dyslexia. However, children with surface dyslexia have a basic problem with the visual-orthographic route. Transforming spoken utterance into its written form depends on lexical action by retrieving complete-word orthographic information from the orthographic output lexicon, resulting in effective spellings of familiar words in both regular and irregular (Brunsdon et al., 2005). Moreover, surface dyslexia has problems with phonological, which, in turn, affects gaining specific irregular words. Irregular words show a

child's ability to get to entire word representations in the visual section of the brain (the orthographic lexicon) and the auditory-related area of the brain (the phonological lexicon) (Brunsdon et al., 2005; Murray et al., 2019). In the beginning, distinguished readers perceive the heard word by activating its entry in the phonological input lexicon and move to the stage of reaching the connected meaning from the semantic system (Brunsdon et al., 2005).

This section will cover two instructional implications that may help younger phonological and surface dyslexia students. The first intervention will be teaching surface dyslexia students some irregular words. The teachers will list some irregular words to be taught to students (e.g., said, yacht, knight, gift, white, roll, busy, much, and sure). Goetry (2010) stated that the correspondences between some "letters" and their comparing "sounds" are not regular with these words. The system must read these words accurately for direct access because the decoding system cannot prompt the right pronunciation. Instead, they prompt "regularization" errors, which are the errors of reading the words with the decoding system as though they were regular. Thus, the instructors should know that such errors are typical in the principal phases of reading yet persist in children with surface dyslexia because they have difficulty remembering or getting to the portrayals of common irregular units or complete words. According to Beecher (n.d.), the role of teachers is to teach students to recognize the alphabetic principle and to know that letter-sound correspondences are irregular letters. Letter-sound correspondences mean students can provide the correct sound for letters and letter combinations. The students' ability to construct links between letters that show sounds indicates they can grasp the motive of the alphabetic code or alphabetic principle. Thus, the teacher can apply the decoding system to teach the students how to blend the letter sounds together to read the words, as shown in the following example.

Goetry (2010) provides examples: Teaching the word "said" should be like < ai >, which is usually

pronounced [â] as in < rain >; thus, this word would be decoded [sâd] instead of [sed]. In the word "yacht," < a > is usually pronounced [a] as in < cat >, and < ch > is usually pronounced [ch] as in < bench >; thus, the word is pronounced [yacht] or [yasht] instead of [yot]. The word "knight" has a silent < k >, and < -ght > has to be stored for direct access; thus, it is pronounced as [k ni.gu...heu-t]. The word "gift" is pronounced with a < g > before < i >, which is usually pronounced [dj] as in < gist >; thus, it is pronounced [djift]. In the word "white," < h > is usually pronounced [h] and not silent; thus, the word is pronounced [whît] instead of [wît]. The word "roll" has the final < ll > that usually follows a short vowel, as in < doll >; thus, [rol] is pronounced instead of [rôl]. In the word "busy," < u > is usually pronounced [u] as in < rust >; thus, [buzi] instead of [bizi]. The word "much" usually pronounces < ch > with [ch] as in [munch]; thus, [much] is read instead of [mutch]. In the word "sure," < s > is usually pronounced [s] as in < sun >, and < u > before < r > is usually pronounced [er], as in < surf >; thus, [ser] is read instead of [choor]. Lastly, the final silent < e > usually lengthens the preceding vowel (magic 'e'), as in < pure > [piur]; thus, this word could also be pronounced [siur] instead of [choor].

These examples show continual regularization blunders demonstrating that the kids are overusing the decoding system and experiencing issues remembering the complete and structured orthographic representations of words, which is the situation in some kids with dyslexia (Goetry, 2010). Teachers can use and apply many strategies to teach decoding that are in the following sites (e.g., We Are Teachers Staff, Reading Rockets, Teaching Expertise, and Thrive Literacy Corner). Moreover, teachers utilize multisensory techniques to help develop memory for the letters in the word while they teach irregular words. Hoisington (2015) suggested some multisensory strategies, such as (1) following the letters on the card while saying the letters; (2) taking a look at the word and saying the letters then the word; (3) taking a look at the word then closing your eyes, writing the letter in the air, and saying the letter; and (4) writing

the letter on a textured surface and saying the letter and then the word.

The second intervention will be teaching phonological dyslexia students Grapheme – Phoneme, where they have difficulty with them. Initially, teachers must know the difference between a grapheme and a phoneme. Phonemes are the smallest sound unit in words (Ehri et al., 2014). Graphemes are one or more that symbolize the phonemes within words (Ehri, 2022). In other words, a grapheme is a letter or letters that spell out a sound in a word. The relationship between phoneme and grapheme is close; therefore, teaching them can be considered together. McCulloch (2019) mentioned that phonemic awareness should follow graphemic awareness. Moreover, the English language has 26 alphabets but over 44 phonemes and 26 graphemes (Koko & Kangiwa, 2021), which teachers should know. Phonemic and graphemic awareness instruction has been discovered to improve spelling and reading in nondisabled children in preschool, kindergarten, and first grade (Wolter & Squires, 2014).

Given that phonemes and graphemes go together, teachers can teach them simultaneously and use the same example. The teachers can use the method of segmenting to help the students determine the sound (phoneme) and spell the sound (grapheme) in a word (O'Connor, 2007). For instance, in the word "sit," students can hear three different phonemes and graphemes, meaning each phoneme is spelled by one letter. If the teacher segments "sit" into sounds, the students get /s/ /i/ /t/. Therefore, the students will learn the phoneme and grapheme of each letter. Moreover, children must know and recognize that the phoneme of some letters can change in sound and spelling. The English language has a complex phonic code, which means the grapheme can include from one to four graphemes and appear as a single sound (phoneme), thus, making it a troublesome language to learn regarding reading and spelling. For example, the letter /c/ has two different sounds. /C/ can be the sound in "cat" as /k/ and /c/ can be the sound in "city" as /c/. Thus, the meaning of the word will be completely different or

does not give meaning to word, and the spelling will be incorrect, such as /c/ spelled as /k/. An example of two-letter phonemes and graphemes follows: If the teacher segments "shop" into sounds, the students get /sh/ /o/ /p/. The grapheme for the sound /sh/ has two letters: /s/ and /h/. Thus, the students learn that /sh/ has one sound with two letters and has two different letter spellings /s/ and /h/. Some examples of three and four-letter phonemes and graphemes are as follows: "Night" segments into /n/, /igh/, and /t/, and the four-letter phonemes and graphemes "dough" segments into /d/ and /ough/. The varying between the letter's sound affects the spelling of words. The letters of the alphabet may not always be reliable in teaching phonemes. However, reliance on letters of the alphabet may be a key aid in teaching graphemes and phonemes. Therefore, children must have the capacity to hear and recognize phonemes plainly, which may help them in spelling (graphemes).

The importance of teaching graphemes and phonemes is to assist children in recognizing them when they need to decode unfamiliar words. For example, when children see the word "boat," they need to know that the grapheme <oa> is a two-letter grapheme that spells the sound /oe/. Thus, the teacher can teach children to segment the word "boat" to /b/, /oa/, and /t/ and then the teacher makes the children blend the sounds together to read the word "boat." This way, the children will learn the phoneme of /oe/ is /oa/ and know that the phoneme of /oe/ in the word 'boat' is spelled /oa/. Some examples of words that create problems when spelling phonemes /oe/ are "go," "snow," "hope," "goat," "soul," "dough," "toe," and "sew." These examples show the phoneme of /oe/ in different words that may confuse children when spelling the words. However, teaching children the method of segmenting words can help them to recognize the phonemes and graphemes.

Assessment Implications

This section will provide two assessments for phonological and surface dyslexia students. The first

assessment is for surface dyslexia students. The assessment that teachers can use is the Abecedarian Reading Assessment. Abecedarian was intended to give diagnostic data about early reading abilities. Educators can use this assessment data to amplify their viability by individualizing their instruction to every student's learning needs (Wren & Watts, 2002). Abecedarian contains six major subtests, and one of these subtests is the decoding test. The decoding subtest has three tasks: fluency, regular words, and irregular words. Given that surface dyslexia students struggle with irregular words, the test will provide the teachers with just the section of irregular words.

According to Wren and Watts (2002), the teachers can administer the test by giving the student a printed list of words. Word lists A and B are shown in Table 1. Table 1 can be copied and folded in half to make either List A or List B visible. Then, the teachers ask the students to read all 10 words out loud. If students get hung up on a single word, the teachers can guide them to skip it and move forward. The teachers make notes on the student score sheet of the responses and show errors by marking them. The teachers can tactfully stop administering the assessment if students miss three of the initial five items or if students become frustrated. Two equal lists are given if, after some instruction in decoding irregular words, educators want to retest the child. The students must get correct 8 out of 10 words to pass this test.

Table 1 List of irregular words

List A of irregular words	List B of irregular words
1. ONCE	1. DONE
2. SAID	2. TWO
3. MR.	3. MRS.
4. COULD	4. SCHOOL
5. MONEY	5. WORM
6. PIECE	6. SIGN
7. SUGAR	7. BUSY
8. ENOUGH	8. SWORD
9. TONGUE	9. THOUGH

10. CANOE

10. COYOTE

Adapted from The Abecedarian Reading Assessment (p. 32), by S. Wren, & J. Watts, 2002, Austin.

The second assessment is for phonological dyslexia. The teachers can use the Thrass Assessment to assess the grapheme and the phoneme of phonological dyslexia. According to Ritchie and Davies (1996), the Thrass Assessment contains five tests to assess students' progress. One of the tests is for the grapheme. The students should be familiar with the materials that the test uses. The teachers should be aware of this. The Grapheme Test evaluates if the learner can pick the right grapheme from a phoneme box to finish each Thrassword and does the same for all 120 Thrasswords. After finishing the grapheme Test, instructors may want to implement a consonant phoneme and vowel phoneme scores, which should be possible by asking the learner to pronounce the phoneme for every phoneme box precisely utilizing the graphemes, the partly finished words, and the images in the rectangle. Teachers write IPA symbols on the phoneme box's right side to record pronunciation errors (See the reference of Richie and Davies). This test can be administered individually or to a group. The teachers photocopy the THRASS Grapheme Test sheets. The teachers should note that, in this test, a learner's underlying choices, where there are at least two graphemes, may entirely or mostly decide the accompanying choice(s). During the test, the teachers must observe how confidently the learner chooses the initial and following graphemes.

The teachers administering the test put a copy of the Grapheme Test in front of the learner. For example, the teachers point to the word of 'ra__it'. They say to the learners, "look at this word." Then, the teachers point to the second word, "__ird," and "say, look at this word." Then the teachers say, a grapheme (spelling choice) has been left out of these words, then the teachers point to the words of "rabbit" and then "bird" and say "look at the phoneme-box here" [b bb]. The teacher asks the learner which graphemes they believe

are right for the words (rabbit) and (bird). The learners must pick a grapheme (i.e., b or bb) to spell each word accurately. Also, the teachers can ask the learner differently, "what do you have to do to spell each word correctly?" The learners choose a grapheme/spelling choice. Then teachers say, "when you have done these words." The teachers sweep their fingers to other words such as "watch" and "chair" and graphemes of these words [ch tch] and say "do these words same the first example." They continue this process for the whole test.

The educators may record results by underlining the graphemes in the words that have been incorrectly completed. The teachers count up the words that have been correctly completed on each sheet and fill in the sub-total. After the last page of the test, the teachers include the sub-totals and fill in the complete box on the first page (See the reference of Richie and Davies).

Conclusion

Teaching phonological is helpful for children with surface and phonological dyslexia, being one of the components of language and supporting reading and all other skills, such as speaking, spelling, and writing. Therefore, educators intrigued by phonological should expect phonological processing to be significant in planning lessons for reading. However, teaching specific problems that children with surface and phonological dyslexia struggle with, such as irregular words and phoneme-grapheme, may assist children in gaining knowledge of phonological awareness and helping them in their reading. Thus, educators must choose the right strategies and development to teach irregular words and phoneme-grapheme that children with surface and phonological dyslexia struggle with. Applying particular assessments to these struggles (irregular words and phoneme-grapheme) is a significant follow-up to children's progress. Also, teachers can use it to follow up on their effective teaching. Thus, the educators decide whether the students need further instruction or whether they can stop and skip to the next lesson based on the assessments.

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