

SERD | Understanding interaction between reading performance and message awareness, lexical awareness, and phonological awareness

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Abstract

This research seeks to understand the interaction between reading performance and awareness of message, lexical, and phonological among seven years old children. The present research was designed in case-study, one of the qualitative research traditions. The research sample consisted of 22 seven-year-old children. The participant children's performances were observed and written-up notes were kept. Data were inductively analyzed. As a result of the data analysis, it was discovered that the children had a slight difficulty with recognizing larger structural units (sentences and words) but had considerable difficulty with smaller units (phonemes, syllables, and letters). Qualitative findings of the study were dealt with the Piagetian Theory and the Gestalt Theory. Findings of the research can be interpreted as that lexical and phonological awareness is more influenced by reading performance under Turkish language teaching context.

Keywords: Early literacy instruction, phonological awareness, lexical awareness, message awareness

Introduction

Reading can be described as the process of translation of visual codes into meaningful language and aspect of language acquisition (Whitehurst & Lonigan, 1998). In other words, reading can be defined as a connection-forming process in which children link written words to their pronunciations and meanings (Ehri, 1991;

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1995). Reading is one of the components of language development. Therefore, reading is closely related to development.

Learning to read and write is such the most abstract aspect of the language acquisition that formal reading instruction begins in the concrete operational period in which children should reach necessary development stage to learn to read and write. Although there is a strong consensus among the academics when the formal reading instruction must commence, there is no consensus about how children are taught learning to read. In other words, reading instruction is too controversial. There are two main approaches in reading instruction. These are Phonetic Based Reading Instruction (PBRI) and Whole Language Approach (WLA). The PBRI claims that printed characters (graphemes) correspond to phonemes (sounds) so reading instruction must depend on direct instruction for the letters and sound (Adams & Osborn, 2006). According to the PBRI, there are two crucial elements in learning to read: understanding of spoken words' properties (phonology) and their written form (orthography) (Talcott, McLean, Rees, Green, & Stein, 2000). In the PBRI, it is considered that phonological awareness is so important for learning to read.

Phonological awareness is defined as the skill to be aware of the sound structure of the spoken language. Phonological awareness encompasses analysis (segmenting a word into its units) and synthesis (combining the constituent segments into the whole word) (Schneider & Naslund, 1992). Phonological awareness helps children to segment word into different parts. There are two ways in helping children to acquire phonological awareness. First one is the synthetic phonics approach. It teaches students to sound out and blend letters to form words. The latter one is the analytic approach that teaches children to divide words into their constituent letters and sounds (Crowley, 2014; Ehri, 2006). Phonological awareness can be measured and defined several different ways. Tasks designed to measure the construct range from recognition of rhyme (Does *fish* rhyme with *dish*?), sound--word matching (Does *fish* begin with /f/?) and to isolation of single sounds from words (What is the first sound in *fish*?), blending (What does /f-i-sh/say?), deleting phonemes (Say *fish* without /f/), and other even more complex manipulations, such as children's secret languages (Stahl & Murray, 1994). Because of the fact that phonological awareness entails manipulating spoken words, the alphabetic principle is crucial to have efficient

phonological awareness. Alphabetic principle is the notion that letters stand for specific sounds. (Ehri, 1995; Stahl, Hester, & Stahl, 1998).

The alphabetic principle has crucial roles for phonological awareness. Because, it is impossible to distinguish sound-letter relationship without alphabetic principle. Development of alphabetic principle consists of four stages. The pre-alphabetic stage is the first stage. Children use cues to recognize words but can't use letters and sounds. The partial alphabetic stage is the second phase. It refers to that children acquire some phonologic awareness and knowledge of letter names and can match initial and final sounds to read or spell words. Even though they lack adequate knowledge of letter names to decode new words, they can remember how to read words by connecting some of the letters and sounds. Children can learn to read words through cues of an initial and final letter at the partial alphabetic stage. For example, reading the word "pencil" by identifying the /p/ and /l/ sounds in its spoken language and linking these to the letters /p/ and /l/ in its written language, just as paying no attention to /e/, /n/, /c/, and /i/ letters (Ehri, 1995). However, children may confuse similarly spelled words such as towel and tower (Ehri & Wilce, 1987). The full alphabetic stage is the stage at which children develop automatic word recognition. When children achieve automatic word recognition, they don't think about words in a text, just concentrate on the meaning of the text in the full alphabetic stage indicates that children have learned the major grapheme-phoneme correspondences. They have already acquired the ability to divide words into constituent units and blend them. At the full alphabetic stage, they can decode familiar words efficiently and establish complete connections between written forms of the letters and the phonemes in their spoken language. In addition to that, the full alphabetic readers learn the skills that help them recognize and sound out the words that they previously could not read. The consolidated phase emerges after children have retained full alphabetic stage completely. As they are familiar with letter patterns that recur in the different words, grapheme-letter connections are consolidated into larger units. This consolidation makes children more adept to more accurately decode and function morphemes and syllables that are multi-letter units (Ehri, 1995; 2003; 2005; Juel, 1983; Stahl, Hester, & Stahl, 1998; Stahl & Murray, 1994).

Phonetic skills are very important because of the fact that it improves phonological recoding which helps children to recognize sounds represented by the letters in the written word and blend them. A large body of research proved that phonological awareness and alphabetic principle have a positive impact on reading success, and predict children's later reading and comprehension skills. In addition to that, phonetic skills in the pre-school period are more predictive word recognition skills in the first-grade year. Therefore, it can be concluded that phonetic skills and alphabetic skills are the precursor of acquisition of the reading skill in the primary school period (Adams, 1990; Brown & Deavers, 1999; Caravolas, Hulme, & Snowling, 2001; Cardoso-Martins, 1995; Hatcher, Hulme, & Ellis, 1994; Hulme, Snowling, & Stevenson, 2004; Muter, Hulme, Snowling, & Taylor, 1998; Wagner, Torgesen, & Rashotte, 1994).

Whole Language Approach (WLA) is another instructional way to teach children to read. The WLA can be based on Gestalt theory and Piagetian part and whole perception. Gestalt theory claims that whole is different from its components and sum of components is not equal to the whole. In other words, the perception of the whole is radically different from the perception of its components (Rock & Palmer, 1990). Furthermore, it suggests that perceptual system ignores details of the parts, focuses on the larger units because the whole is more predictable than the detail. Word and letter relationship is an excellent proof of the Gestalt theory (Navon, 1977). Gestaltist researchers observed that readers are not affected by omission of the letter in texts or words that they read (Johnson, 1975; Warren, 1978). Piaget's idea that whole precedes the parts, is another contributor to the WLA. The children, who have already begun the formal reading instruction, are in the concrete operational period. In this period children use such general schemas because of the syncretistic understanding that they first perceive and understand the whole without analysis of the parts. This non-analytical habit stems from ego-centrism. When a child confronts an unfamiliar word, he assimilates the unknown word as a function of the general schemas that precludes him to analyze the word syllable by syllable or letter by letter (Piaget, 2005). Piaget's theory of the cognitive development indicates that children will only perceive the word as a whole that is compatible to the general schemas, not focus on the letters when they try reading an unfamiliar word whose one letter is missing.

The WLA stresses the importance of focusing on the meaningfulness of language. In other words, the WLA doesn't suggest that individual sound-letter relationship is taught initially. It advocates refuse to give individual sound-letter relationship in isolation initially (Stahl & Miller, 1989). They also believe that acquisition of reading as written language and acquisition of oral language break out and develop concurrently. Therefore, they note that acquisition of reading occurs as easily and naturally as the acquisition of language (Whitehurst & Lonigan, 1998). According to WLA speaking, writing, listening and reading are interdependent and interrelated.

The main aim of the WLA is to bring children into literacy through natural ways by removing the gap between children's own language competencies and written language (Stahl & Miller, 1989). In the WLA, skilled reading is a psycholinguistic guessing game in which reader deduces unfamiliar words from their contexts. Instruction in reading begins when children have adequate ability to think with words (Whitehurst & Lonigan, 1998). Because of the fact that children can more accurately identify words in context than isolated sound-letter relationship context (Goodman, 2005). For instance, in reading a text *"the cowboy rode a ..."* the reader can predict that the next word is *"horse"* and notice initial *"h"* to confirm his prediction. Therefore, teachers must encourage their students to make word-level predictions and use context aids (McKenna & Piccard, 2006).

If the WLA is implemented thoroughly, it instills love of literature, problem-solving and critical thinking skills. It has some advantages compared to the PBRI. These advantages include creating strong-concept of print, more positive attitude toward reading and word recognition. In addition, the fact that the WLA exposes readers to rich texts read aloud by teachers increases vocabulary growth (Stahl & Kuhn, 1995).

Teaching to read is a very controversial issue but there is a general rule that children first recognize larger and more obvious units such as messages, words, and syllables as they develop, they will notice smaller, more abstract units such as onsets, rimes, and phonemes (Murray, 2006). This rule roughly displays what method must be employed in teaching to read initially. Reading instruction begins to influence children's awareness of larger units within two years of reading instruction. After two years children develop sensitivity to the consistencies within the grapheme-phoneme system (Treiman & Kessler, 2005).

Learning to read depends on language characteristics. There are two types of language: transparent language and opaque language. There is always one to one correspondence between letters and sounds in transparent languages. In other words, every letter represents only one sound. Therefore, it is so easy to decode that it is easier to learn to read in transparent languages than in opaque languages. Contrary to the transparent languages there is not one to one correspondence between letters and sounds in opaque languages (Snowling & Gobel, 2011; Stahl, Hester & Stahl, 1998). Turkish is a transparent language in which every sound is represented by one specific letter.

In the Former Turkish Literacy Curriculum, reading instruction depends on the sentence analysis. First, children read aloud the sentences with the teacher. Second, the sentences used to be segmented into constituent words and the words were divided into their syllables and letters. After the students have come to notice the letters in the sentence, they construct different words with the same letters. This application depended on the WLA. This instructional application, based on the WLA, was rescinded in 2005 and the PBRI has been employed to teach reading. In the New Turkish Literacy Curriculum, phonemes of the letter are taught, and orthographic representations of the letters are introduced with various activities. The children's initial attempts of reading consist of two or three letters. As classroom teachers teach more phonemes with their letters, children can combine more letters to form words. While teachers are teaching the phonemes, they care to connect the phonemes and their letters with children's daily life and pre-existing knowledge. In the PBRI, children are expected to build up new words by combining the letters (Akyol & Temur, 2008; Bilir, 2005).

The objective of the Research

In the relevant literature it is emphasized that phonological awareness is a better indicator of reading performance, comprehension, and fluency. Demont & Gombert (1996) concluded that phonological skill improves recoding and decoding skills among primary school children. Suggate (2016) reported that training of phonological awareness improves comprehension skill of primary school children. De Jong & Van Der Leij (2002) found that phonological awareness is associated with word decoding in first grade. Cain, Oakhill, & Bryant (2000) concluded that

phonological awareness developed children's reading performance. Bus & Ijzendor (1999) found that phonologic awareness is an important skill in early reading as result of the meta-analysis. Stanovich & Siegel (1994), Wolf & Bowers (1999) emphasized that reading disabilities are related to phonologic awareness and processing. Moreover, Hogan, Catts, & Little (2005) found that phonologic awareness in kindergarten predicts word reading performance in 2nd grade of primary school. Hulme, Hatcher Nation, Brown, Adams, & Stuart (2002) concluded that phonological awareness is a good indicator of reading in kindergarten and primary school period. The present research aims to understand the influence of reading performance on message awareness, lexical awareness, phonological awareness, and explain through the Piagetian Theory and the Gestalt Theory.

Method

Design of the Study

Research in the social sciences aim to predict and control variables (1), understanding and interpreting a phenomenon under its natural settings (2), emancipating human beings (3) (Habermas, 1972). While predicting and controlling emphasizes quantitative research tradition, understanding and interpreting highlight qualitative research tradition. Purpose of the present study is understanding and interpreting participant children's letter recognition so qualitative research tradition was employed to design the study. Case study, one of the qualitative research traditions was employed in the study. Case study enables the researcher to investigate a bounded system (a case) over time through detailed in-depth data collection. Furthermore, the case study is very convenient for the researchers to use multiple sources of data collection such as observation, audio-visual materials, interview (Basse, 1999; Creswell, 2007). Performance patterns of the participant children were sought to reveal in the present study. Therefore, participant observation was used to collect data.

Selection of the Participants

In the study, the purposeful sampling strategy was used to include the participant children. Selection criterion depends on the criteria of learning the number of letters according to the National Turkish Literacy Curriculum within 5 months. Before the data collection, primary schools were visited, and class teachers were met in order to get approval and decide classroom case met the criterion. Therefore, 22 children who had received kindergarten instruction were included in the sample. All of them were seven years old and native Turkish speakers. After consent from the participant children's family was provided, the study was commenced. In addition, pseudonyms such as "*Participant Children 1, Participant Child 2*" were given to all of the participant children to keep their names secret and obey the ethical rules.

Development of Tasks as Data Collection Instrument

Before tasks were determined the relevant literature was reviewed to decide what to ask the participant primary school children (Ehri, 2003; Metsala & Walley, 1998; Seidenberg & McClelland, 1989; Stanovich, Cunningham & Cramer, 1984). As a result of the literature review, it was decided that the task form consists of message awareness, lexical awareness, and phonological awareness. The task form was developed and designed by the researchers. The task form was investigated by experts of Turkish language, primary school teachers. The task form was revised along with the expert review. Finally, the task form includes 3 items for message awareness, lexical awareness, and phonological awareness. These components are concerning with message awareness, lexical awareness, and phoneme awareness. In other words, these components were arranged from larger units to smaller units. The teacher taught e, l, t, i, n, r, m, u, k, ı, y, s, d, ö, b. Therefore, in each of the parts, the researchers cared to use the letters, words, phonemes that the children had been familiar with.

In the first task, the participant was asked to read the text and match the text to the relevant picture. The researchers demanded that the children read the words and correspond to the relevant pictures in the second component. Finally, the children were asked to read and complete the missing letters (sounds) within the five selected words.

Entering into the Field

After official permission from local authorities, necessary approval from participant children's parents, teacher was taken, the study was launched. The children were such the first graders who have started formal literacy instruction for about five months that walls of the classroom were decorated with letters, previously learned words, numbers. When all structured interviews with the participant children were conducted, all observation and field notes were displayed to the teacher of the participant children in order to comply with ethics rules.

Implementation of Data Collection Tools

The researchers divided the children into five groups. Each group consisted of 4-5 children. The task form was implemented individually not whole. The tasks were asked in order from larger units to smaller units. Just as the participants were doing the tasks in the components, the researchers kept the notes through their observations. The researchers observed the participant children while they were fulfilling the tasks. Participant children's individual performances were observed; written-up notes were taken. Observations were analyzed according to results of the tasks in each part.

Data Analysis

Written-up field notes of the observers about the participant children's responses to the tasks were analyzed inductively. Each researcher's written-up field notes were read iteratively, and codes were identified and clustered into categories, which is the larger concept.

Findings

Findings of the research based on inductive data analysis were indicated below.

Message Awareness

Written-up field notes were read, and codes were identified as “Word Awareness Within the Text”, “Adequate Awareness of the Task”, and “Adequate Awareness of the Task with Slight Spelling Difficulty”. Those codes were clustered into “Message Awareness” category.



Figure 1. The participant student 10's performance on the task

“The Participant Child 22 read the text very fluently. In addition, she managed to find the animals name within the text then matched the relevant picture.” This finding was coded as Awareness within the Text.



Figure 2. The participant student 7's performance on the task

“The Participant Child 7 read the text fluently and matched the relevant picture without focusing smaller units such as words, syllable.” This observation note was dimensionalized as Adequate Awareness of the Task.



Figure 3. The participant student 11's performance on the task

“The Participant Child 11 did not read very fluently and had a difficulty with spelling three words. Although he did not manage to perform the task very well, he seemed to understand the text then marked the relevant picture.” This written-up filed note was coded as Adequate “Awareness of the Task with Slight Spelling Difficulty”

Findings related to *Message Awareness Category*” was interpreted as that all of the participant children could understand what the reading text implies although a few of them had difficulty with reading. Moreover, lack of phonetic skills did not impede poor performers to understand the text's meaning so findings related to *“Message Awareness Category”* can be explained that reading difficulty is not a barrier in understanding the text.

Lexical Awareness

The Participant Children were demanded to read the words and match the relevant pictures in this task. Codes were extracted from the observation and the Participant Children' performance on the task.

Codes were extracted from the observation notes and determined as “Adequate Word Awareness”, “Adequate Word Awareness with Slight Spelling Difficulty”, “Deficient Awareness of Word”. The tasks are about lexical performance so those codes were grouped into “Lexical Awareness” category.

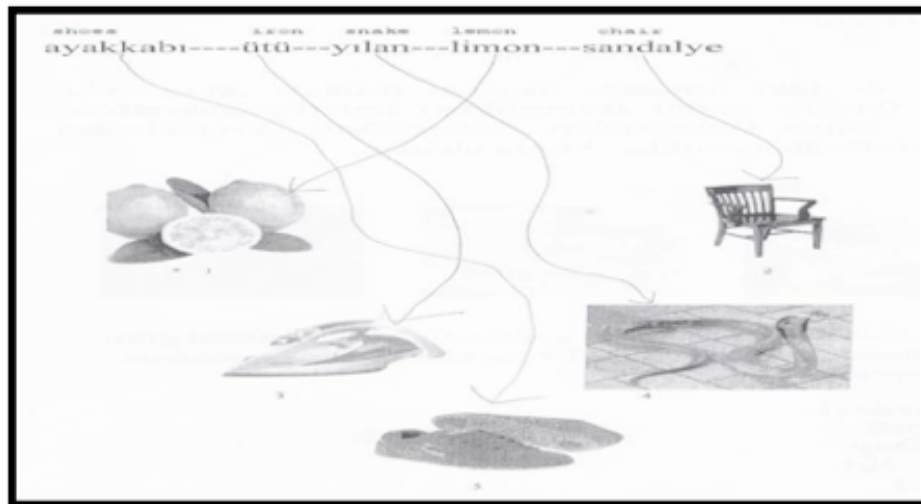


Figure 4. The participant student 20’s performance on the task

“The Participant Child 20 read the words without any difficulty and matched the words to their relevant pictures very easily”. It was coded as “Adequate Word Awareness”

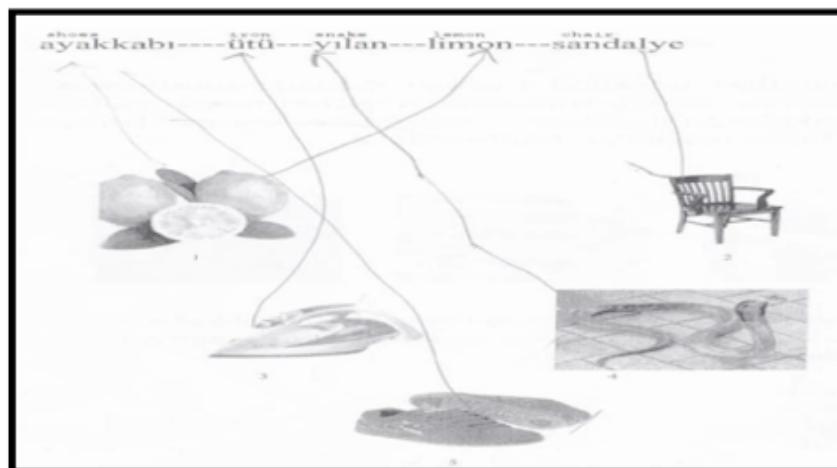


Figure 5. The participant student 17’s performance on the task

“The Participant Child 17 performed the task with slight difficulty with spelling ayakkabi (shoes) and sandalye (chair). However, he could match the words to their relevant pictures with little hesitation”. This finding was dimensionalized as “Adequate Word Awareness with Slight Spelling Difficulty”

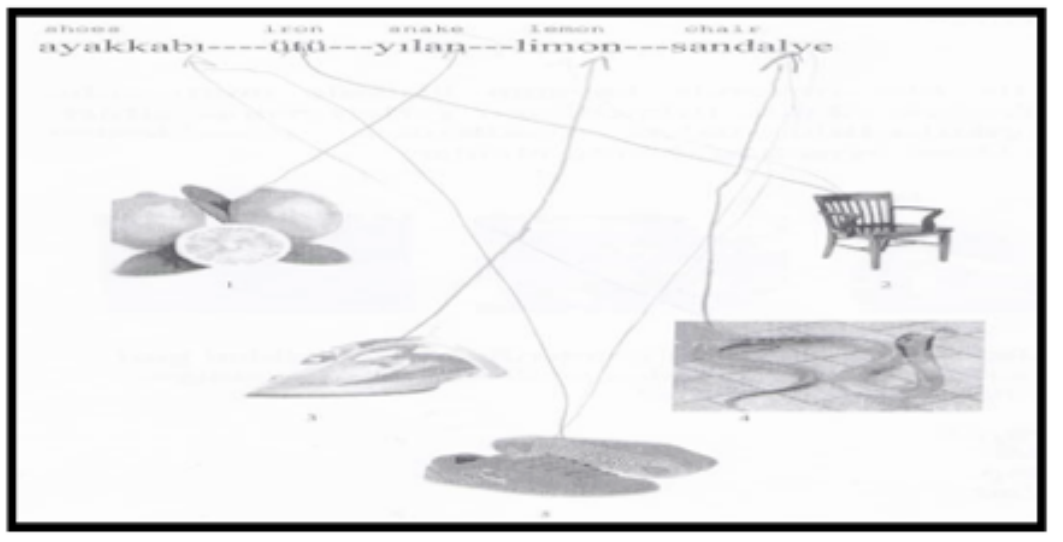


Figure 6. The participant student 3's performance on the task

“The Participant Child 3 read the words with poor performance because of the spelling error. The Child may have been distracted due to the spelling error and difficulty. As a result, he did not manage to match the words to their relevant pictures.” This observation note was coded as “Deficient Awareness of Word”

Findings of lexical awareness can be interpreted as poor reading performance prevented the participant children to understand the meaning of the words. Therefore, fluent reading is more critical in understanding word meaning.

Phonological Awareness

There are five words that have a missing vowel, in the last part of the task form. After a short story was explained to the participant children by the researchers, they were asked to read the words and find the right letters. Regularities were identified among written-up field notes through iterative reading and codes were found. Codes as *“Adequate Phonological awareness”, “The Ability to Read the Words but not to Find*

Correct Letter", and *"Deficient Phonological awareness"* were identified among the written-up field notes. The task entailed the participant children to recognize such letter and sound matching that the codes were clustered into *"Phonological awareness."*



Figure 7. The participant student 22's performance on the task

"The Participant Child 22 predicted the words correctly, read fluently and put the correct letters into the blanks. Because of the appropriate orthographic representation and word recognition ability she appeared to have adequate phonological awareness". This data was coded as *"Adequate Phonological Awareness"*.



Figure 8. The participant student 17's performance on the task

"The Participant Child 17 was able to read the first, second and fourth words and find the correct letters. Although he could read third and fifth words, he didn't write the correct letters"

into the blanks. This fault may have stemmed from the insufficient orthographic representation." "The Ability to Read the Words but not to Find Correct Letter"



Figure 9. The participant student 9's performance on the task

"The Participant Child 9 neither could predict the words nor he was able to read the words and find the correct letters. He has lack of word recognition skills and orthographic representation. His phonemic awareness and word recognition skills need developing." This data was dimensionalized as "Deficient Phonological awareness"

Findings on "Phonological awareness" indicated that poor orthographic representation leads to insufficient phonological awareness. On the other hand, insufficient phonological awareness impeded poor performers to recognize, decode words and find correct letters. Lack of phonologic awareness leads to insufficient decoding skills.

Discussion

The present study's main purpose is to understand the interaction between reading performance and message awareness, lexical awareness, and phonological awareness among Turkish first-grade primary school children. In the research, it was observed that the participant children with better phonological awareness performed the tasks on the message awareness, lexical awareness, and phonological awareness. It was also determined that the participant children who have less phonological awareness

responded the task on message awareness satisfactorily, while they had poor performance on lexical awareness and phonological awareness. Therefore, findings of the research can be interpreted as that deficient phonological awareness did not prevent the participant children to understand what the text means whereas the participant children with deficient phonological awareness are vulnerable to poorly perform smaller units such as words, syllables, and letters.

The poor performance of the participant children on lexical awareness and phonological awareness tasks can be dealt with through the explanation how a child gains phonological awareness developed by Stahl, Osborn, & Lehr (1990). According to this idea, child first realizes and recognize larger and obvious units such as messages and words. As children go on the formal reading instruction, they come to notice smaller units from onsets and rimes to phonemes (Stahl, Osborn, & Lehr, 1990). Furthermore, they can't recognize smaller and abstract units unless they receive two years formal reading instruction (Treiman & Kessler, 2005). Findings of the present study confirm both of the results. In the study, the participant children who had five months formal reading instruction were good at recognizing messages and words that were rather obvious and concrete. In contrast to the findings in message awareness and lexical awareness, very few the participant children were successful to accurately recognize and find the missing letters which were more abstract and smaller units. It can be predicted that they will be able to notice smaller units when they are instructed on learning to read for over two years. In addition to that, the idea of gaining phonemic awareness and longitudinal effects of formal reading instruction is valid for Turkish, which is a transparent language. Moreover, four of them were able to recognize the relevant animals name and find within the text. This finding can be an indicator of efficient word recognition skills and reading comprehension.

The last task on the form was for alphabetic principle, grapheme and phoneme correspondences. Findings of the research related to grapheme and phoneme correspondences can be explained through alphabetic principle and phonological awareness developed by Ehri (1999). Alphabetic principle and phonological awareness play very crucial role in learning to read. Development of alphabetic principle has four stages. These are the pre-alphabetic stage, partial alphabetic stage,

and full alphabetic stage, consolidate alphabetic stage. At the stage of the pre-alphabetic stage, children use cues to recognize words but can't use letters and sounds. At the partial stage, children can develop phonologic awareness but they lack adequate knowledge of letter names. They remember how to read words by connecting some of the letters and sounds and match initial and final sounds to read. Children have adequate phonological awareness and ability to recognize words automatically at the full alphabetic stage (Ehri, 1991; 1995; Stahl et al., 1998; Stahl & Murray, 1994). The participant children could read and recognize words not the letters and very few of them could recognize letters and their sounds. In other words, they did not learn grapheme-phoneme correspondences, although formal reading instruction was based on phoneme and letter correspondences. This finding indicates that the participant children could reach partial-alphabetic stage within five months of formal reading instruction under Turkish language contexts.

The findings in the last part of the form yielded very important results. 15 of the participant children managed to read the words whose one letter is missing but did not manage to find and recognize the missing letters. 5 of them neither read the word correctly nor recognize the missing letters. Besides the majority of them could know single letters and their sounds but did not manage to know how to use them in the words. This result confirms several studies' results in the literature (Johnson, 1975; Palmer, 1975; Warren, 1978). The result can be explained through the Cognitive Development Theory by Piaget and the Gestalt Theory. The Gestalt Theory puts forward that whole is so predictable that omission of the letters can't prevent the readers to read the word whose letters are deleted. In fact, a great number of the participant child could read the words that had one missing letter. This result also can be related to the Cognitive Development Theory developed by Piaget. In the tasks, the participant children confronted five familiar words that had missing one letter. Although there were missing letters, they could read very easily. Because the participants who are in the concrete operational period, read the words by using the general schemas. Usage of general schemas prevented them to focus on the missing letter but helped them to predict and read the words. However, their natural inclination to syncretistic thought precluded them to concentrate on the missing letters and find them. In addition, their syncretistic thought may prevent the development of alphabetic principle and phonological awareness on them. Therefore,

the WLA seems to be a suitable way of teaching to read for the children who are the concrete operational period.

Phonological awareness and alphabetic principle are so crucial for children's achievement in reading because of the fact that both of the concepts enable children to read recognize and manipulate words and read independently (Adam, 1990). Therefore, reading instruction must be based on the correspondences between sounds and letters. On the other hand, general sensitivity to grapheme-phoneme and smaller units don't break out within two years of the formal reading instruction (Caravolas et al., 2001). It revealed that the participant children were at the stage of the partial alphabetic stage and did not develop any sensitivity to the grapheme-phoneme consistencies although their teacher was teaching to read through PBRI. It is advisable for the case that the teacher first starts teaching to read by employing the WLA without excluding the PBRI principles until they acquire the necessary abilities for the full alphabetic stage such as letter knowledge, grapheme-phoneme sensitivity.

In sum, this case study reveals that awareness of larger units such as sentences, word occur earlier than phonological awareness and the participant's developmental characteristics (syncretistic thought and lack of analysis skills) prevent them to recognize letters even if they are taught to read through the PBRI.

Conclusion

The study was conducted under Turkish Language context on the children received literacy instruction through the PBRI. The findings of the study are not convenient to generalize because of the nature of qualitative case study inquiry. In the present research main aim is not to reveal the children's longitudinal development of reading acquisition or determine that transparent languages help the phonological awareness and alphabetic skills to break out earlier than opaque languages. The study depicted what the participant children taught reading through direct instruction of letters and sound correspondences, could do after they had been instructed for over five months. As a result of the research, it was concluded that poor reading performance more interacts with lexical awareness and phonological awareness. It was also

observed that the Turkish primary school first graders need much more time to develop sensitivity on smaller units such as words and phonemes.

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