DIFFERENTIATING POOR AND GOOD READERS

IN SECOND GRADE:

COGNITIVE AND LINGUISTIC VARIABLES

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DECLARATION OF ORIGINALITY

I, Semanur Kuzucu Örge, certify that

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ABSTRACT

Differentiating Poor and Good Readers in Second Grade:

Cognitive and Linguistic Variables

The present study examined the relationships of reading fluency with cognitive and linguistic skills in second graders. In particular, the roles of phonological awareness (PA), rapid automatized naming (RAN), phonological memory (PM) and morphological awareness (MA) in prediction of oral reading fluency (ORF) were explored in Turkish poor and good readers. Sixty six second grade students participated in the study and the measurements of ORF, PA, RAN, PM, and MA were administered. After data collection, the sample was divided into two groups as poor and good readers based on the students' performance on ORF. The findings showed that relationships between ORF and other variables differentiate in poor and good readers. PA and RAN were related significantly to ORF in poor readers while ORF was correlated with PA and MA in good readers. Also, regression analyses indicated that PA is the most significant predictor to ORF in poor readers while MA is a significant precursor for ORF in good readers. Moreover, both PA and RAN have additional explanations to ORF in poor readers although only MA was a significant contributor of ORF in good readers. Consequently, these findings demonstrated that poor readers are on the process of reading acquisition via phonological awareness and naming speed, but good readers move up into semantics of words via morphological awareness. As Turkish is a transparent and agglutinating language, the results of this study offer a different perspective on Turkish reading development.

ÖZET

İkinci Sınıfta Zayıf ve İyi Okuyucuları Farklılaştıran
Bilişsel ve Dilbilimsel Değişkenler

Bu çalışma, ilkokul ikinci sınıf öğrencilerinde, sesli okuma akıcılığı ile bilişsel ve dilbilimsel beceriler arasındaki ilişkileri incelemektedir. Çalışma kapsamında, özellikle, zayıf ve iyi okuyucularda, fonolojik farkındalık (FF), hızlı otomatik isimlendirme (HOTI), fonolojik hafıza (FH) ve morfolojik farkındalığın (MF) sesli okuma akıcılığındaki belirleyici rolü araştırılmaktadır. Araştırmaya, 65 ikinci sınıf öğrencisi katılmıştır ve sesli akıcı okuma ile FF, HOTI, FH ve MF becerileri ölçülmüştür. Veri toplandıktan sonra, örneklem, öğrencilerin sesli okuma akıcılıklarına göre zayıf ve iyi okuyucular olarak iki gruba ayrılmıştır. Bulgular, sesli okuma akıcılığıyla diğer değişkenler arasındaki ilişkilerin, zayıf ve iyi okuyucularda farklılaştığını göstermiştir. İyi okuyucularda, FF ve MF, sesli okuma akıcılığı ile korelasyon gösterirken; zayıf okuyucularda, FF ve HOTI'nin, sesli okuma akıcılığı ile ilişkili olduğu görülmüştür. Ayrıca, regresyon analizlerinde, zayıf okuyucularda sesli okuma becerisini yordayan en önemli ölçüt, FF iken; iyi okuyucularda en belirleyici ölçüt, MF olarak bulunmuştur. Elde edilen bulgulara göre, FF ve HOTI, zayıf okuyucularda, akıcı okumaya ayrı ayrı önemli katkı sağlarken; iyi okuyucularda, sadece MF'nin önemli bir katkı sağladığı bulunmuştur. Sonuç olarak, bulgular, zayıf okuyucuların ses farkındalığı ve hızlı isimlendirme ile hala okumayı öğrenme aşamasında olduklarını; fakat iyi okuyucuların morfolojik farkındalıkla kelimelerin anlam bilgisine geçiş yaptığını gösteriyor. Türkçe, yazıldığı gibi okunan ve sondan eklemeli bir dil olduğundan, bu çalışmanın sonuçları, Türkçe okuma gelişimi üzerine farklı bir bakış açısı sunmaktadır.

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CHAPTER 1

INTRODUCTION

This chapter presents the rationale of the study, statement of the problem and the significance of the study. Firstly, it provides definitions of oral reading fluency and its cognitive and linguistic components. Then, as major components of literacy development, PA (phonological awareness), RAN (rapid automatized naming), PM (phonological memory) and MA (morphological awareness) are given with special reference to poor and good readers. Lastly, the significance of the study and purpose of the study are presented.

1.1 Reading development

The current study examines a set of cognitive and linguistic measurements for poor and good readers in the second grade. In the first grade, children have to read syllables, words and sentences fluently (MEB, 2015). It is usual that some children might have some difficulties during the processes of reading acquisition at this stage. However, a child in the second grade is expected to handle these difficulties and begin to comprehend the meaning of words, sentences and paragraphs.

In this section, before the definition of reading fluency, the acquisition of reading processes is given briefly. Various stage/phases theories were developed to explain reading acquisition (Chall, 1983; Ehri, 2005; Frith, 1985; Seymour, 2006). One of the theories of reading development is known as the dual foundation model of Seymour (Seymour, 2006) and this theory gives a comprehensive explanation to reading acquisition from pre-literacy to semantics of words. In the dual foundation

model, there are four phases of reading acquisition. These are alphabetic knowledge, foundation literacy, orthographic literacy and morphographic literacy. In the alphabetic knowledge, a child knows symbols and their correspondences with sounds in the spoken language. The foundation phase consists of logographic and alphabetic processes. As the logographic phase is the process of accumulating the sight words in memory, the alphabetic process is similar to decoding. In addition, the orthographic phase includes onsets and rime; the morphographic phase contains syllables and morphemes to form the representations of complex words. They can be seen as the first two phases that are required for reading acquisition via phonological memory, phonological and rapid naming skills because Seymour (2006) proposes that reading is acquired during the formation phase and the later phases are used for fluent reading. That means if a child begins to read fluently, he or she understands onsets and rimes and later syllables and morphemes. Therefore, the term of morphological awareness which refers to the ability to consider and manipulate consciously the smallest units of meaning in language (Apel, Diehm, & Apel, 2013) comes into the morphographic phase. Although the model presents a sequence of reading development, Carlisle (2003) states that linguistic dimensions such as meaning (semantics), grammar (syntax), phonemes, and spelling play roles interactively in morphological processing. Therefore, the present study focuses on the relationship between reading fluency and reading related variables as phonological skills, rapid automatized naming, phonological working memory and morphological awareness.

Oral reading fluency is defined as the oral translation of text with speed and accuracy (Adam, 1990). Oral reading fluency is seen as a complicated performance of the reader by Fuchs, Fuchs, Hosp, and Jenkins (2001) who advocate oral reading fluency as an indicator of overall reading competence. Also, Hasbrouck and Tindal

(2006) suggests that oral reading fluency should be used as a screening measurement for evaluating reading performance of students no matter whether they are in the grade appropriate or not. Therefore, this study used oral reading fluency which contains automaticity with speed and accuracy in a text as a reading performance indicator.

1.1.1 Cognitive and linguistic variables of reading fluency

Oral reading fluency contains phonological awareness, rapid automatized naming, working memory and morphological awareness according to Seymour's dual foundation model (2006). Wagner and Torgesen (1987) also argue that reading is acquired with phonological processing. In their phonological processing model, phonological awareness, rapid naming and phonological memory process together for reading acquisition.

Some studies specially investigated the relationships among these variables in reading development of normal readers (Juul, Poulsen, & Elbro, 2014; Lipka, 2017; Muter & Snowling, 1998; Parrila, Kirby, & McQuarrie, 2004). Juul and colleagues (2014) studied 172 Danish readers starting from kindergarten throughout second grade. They found that phoneme awareness is a strong predictor of accuracy and RAN has also unique contribution to the total variance of accuracy. However, RAN is also the only significant predictor of speed in second grade reading. Another longitudinal study showed that phoneme awareness and phonological memory are significant predictors of reading at 9- year-old children (Muter & Snowling, 1998). They followed 34 preschoolers in 4 year- long study. Moreover, it was found that phonological awareness and RAN of kindergarten and first grade are significant predictors in word reading in first, second and third grade (Parrila, Kirby, &

McQuarrie, 2004). In contrast to Muter and Snowling (1998), phonological memory/ verbal short term memory turned out not to have a unique contribution to reading after controlling phonological awareness and RAN.

In addition to the importance of phonological awareness and RAN in the reading literature, recent studies also focused on morphological awareness (Duncan, Gray, Quemart, & Casalis, 2010; Rothou & Padeliadu, 2015; Liu & Zhu, 2016; Lipka, 2017). Muter and Snowling (1998) investigated concurrent and longitudinal predictors of reading. They found that not only phoneme awareness and short term memory but also grammatical knowledge predicts reading at 9-year-old children. A recent study was conducted by Lipka (2017) to examine oral reading fluency and cognitive and linguistic abilities in a longitudinal aspect. In this study, working memory, phonological awareness, RAN and syntactic awareness were measured in students from second grade to six grade. In the second grade, it was found that syntactic awareness, RAN (numbers), working memory (words repetition) are significant predictors of reading fluency. RAN and syntactic awareness had unique contributions to the total variance of reading fluency (Lipka, 2017).

In summary, the studies about reading fluency focus on cognitive and linguistic components of reading in normal readers. Many studies showed that phonological awareness and rapid naming are related to reading fluency. Although the relationship between phonological memory and reading fluency is found inconsistent in the reading literature, morphological awareness has an important role in reading fluency in normal readers. Thus, in order to show whether there are differences in cognitive and linguistic variables, the next section presents the relationships between these variables and reading fluency in poor readers.

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1.1.2   Cognitive and linguistic variables of poor reading

The relationships of cognitive and linguistic variables are also so crucial for poor readers to understand which variable(s) creates a difference in reading performance. As an explanation of poor reading, the double deficit hypothesis (DDH) was proposed by Wolf and Bowers (1999). According to Wolf and Bowers, reading problems arise from the deficits in RAN and/or phonological skills. That means a child with reading problems may have difficulty in phonological abilities or in RAN. If the child has problems in phonological awareness and RAN together, he or she is more severe in reading than a child with one deficit in these functions.

The double deficit hypothesis holds that children who have reading problems can suffer from phonological awareness and RAN separately or together. As supporting DDH, some researchers found that phonological awareness and RAN are cognitive predictors of poor reading or reading difficulties in English and other languages (De Groot, Van den Bos, Van der Meulen, & Minnaert, 2017; McBride-Chang, Liu, Wong, Wong & Shu, 2012; Powell, Stainthorp, Stuart, Garwood & Quinlan, 2007; Wolff, 2014) and all phonological processing abilities (Carroll, Solity, & Shapiro, 2016). McBride-Chang et al. (2012) examined the cognitive and literacy skills of normal and poor readers at age 5 in a longitudinal study. They measured phonological awareness, RAN, morphological awareness of poor readers in English, of poor readers in Chinese, of poor readers who speak English and Chinese bilingually and of a control group. All groups of poor readers showed a lower performance on phonological awareness than normal readers in a four-year longitudinal study. On the other hand, Wolff (2014) recently found RAN as a predictor of the reading speed in reading difficulties. The researcher followed 112 children with reading difficulties in a longitudinal intervention study. The results

showed that RAN predicted the reading speed in children with reading difficulties and also there was a reciprocal relationship between RAN and reading speed in children with reading difficulties. More recently, De Groot et al. (2017) found that children with reading disabilities have also PA and RAN impairments. In addition to PA and RAN, it was found that verbal short term memory is also a predictor of later poor reading (Carroll, Solity, & Shapiro, 2016). Carroll et al. (2016) examined predictors of poor reading with a large group (n=267 children) in a four-year longitudinal study. They found that poor readers show lower performance on all phonological processing abilities.

On the other hand, Koda (2005) has a different assumption that morphological awareness can differentiate poor and good readers. The study of Duncan, Gray, Quemart, and Casalis (2010) supported this assumption. They studied 30 third and fourth graders with two groups: poor and good readers. The results showed that good readers have better performance on derivational morphology than poor readers.

The reading literature on morphological awareness reveals that morphological and phonological structures of languages affect reading development. For example, the Turkish language has more transparent orthography than English. This means that Turkish has more regular sound-letter correspondences. Thus, Turkish children learn more accurately and faster decoding in the first grade than American children (Öney & Goldman, 1984). In terms of its morphological structure, Turkish is an agglutinative language, in which a suffix can be added to end of words. Also, Turkish has almost two hundred derivational suffixes and many inflectional suffixes (Gedizli, 2012). The effect of Turkish morphology on reading is a new area for the researchers who study on reading development in Turkish while the relationships

between reading and other variables were studied earlier. Therefore, the next part presents the studies on cognitive and linguistic variables of reading fluency in the Turkish language for understanding the significance of the current study.

1.1.3   Cognitive and linguistic variables of reading fluency in Turkish

There are some studies about reading fluency of normally developing Turkish children (Erden, Kurdoğlu, & Uslu, 2002; Gökçe-Sarıpınar & Erden, 2010). They focused on differences in reading fluency in terms of age or grade level. Also, studies on children with reading difficulties showed that these children have lower performance on reading accuracy (Baydık, Ergül & Bahap-Kudret, 2012; Sidekli, 2010) and speed (Ergül, 2012; Gökçe-Sarıpınar & Erden, 2010).

Studies on reading fluency and its relationships with cognitive and linguistic variables are still limited in the Turkish language. Although phonological awareness attracted researchers' attention earlier (Öney & Goldman, 1984), studies on rapid naming (Bakır & Babür, 2009), phonological memory (Kesikçi & Amado, 2005) and morphological awareness (Babayiğit & Stainthorp, 2010) in Turkish have started to reveal the relationships with reading fluency in the last decade. Phonological awareness and reading fluency were found significantly related in kindergarten and first grade in Turkish students (Durgunoğlu & Öney, 1999; Güldenoğlu, Kargın, & Ergül, 2016; Öney & Durgunoğlu, 1997). In addition to phonological awareness, some studies found that RAN was the most significant predictor of reading fluency in second, third and fourth grade (Babayiğit & Stainthorp, 2010; Babayiğit & Stainthorp, 2011). Also, although reading fluency and phonological memory were found related to each other in early years of reading acquisition (Babayiğit & Stainthorp, 2007), there was an inconsistency in this relationship (Babayiğit &

Stainthorp, 2011). Lastly, there are only two studies about relationships between morphological awareness and reading skills. The results showed that morphological awareness is not a predictor for reading fluency in second grade (Babayiğit & Stainthorp, 2010) and middle school students have lowest morphological awareness (Batur & Beyret, 2015). In summary, cognitive and linguistic variables of reading were studied especially in primary school years.

Although there is a growing literature in last decades about reading problems in Turkish, there are few studies that contain cognitive variables such as working memory or executive functions (Özkardeş, 2013). Özkardeş (2013) made a descriptive analysis of the studies in learning disabilities between 1972 and 2011 in Turkey. She stated that the term of "poor readers" is used interchangeably for reading difficulties, reading disability, reading disorders, special learning disability, learning problems, and learning disabilities in the Turkish reading literature. She preferred to use the term "specific learning disabilities" rather than reading problems or difficulties. However, the current study does not focus on specific learning difficulties so the term "poor reader" is chosen for children who are below the grade appropriate in reading without a diagnosis of reading difficulty or learning disability. Still, the poor readers in the present study are considered as at-risk for reading disabilities.

As regarding poor readers, only one single study was found about cognitive and linguistic variables in poor readers (Babür & Abolafya, in preparation). That study investigated RAN and reading skills (letter knowledge, reading fluency and reading comprehension) in poor and good readers in the second grade. The results of the study showed that poor readers have lower performance on RAN than good readers. Although the study is very important for showing cognitive and linguistic

variables of reading in poor and good readers, only RAN was used as a cognitive variable. In addition, no study was conducted include phonological awareness, phonological memory and morphological awareness separately or together in poor readers. Therefore, the next parts present the significance and purpose of the present study.

1.2 Significance of the study

There is an increasing interest on reading development in the Turkish language, so relationships between reading fluency and cognitive/linguistic components of reading are attractive areas for researchers. These relationships have been explored in previous research in normal readers (Babayiğit & Stainthorp, 2010, Babayiğit & Stainthorp, 2011; Batur & Beyrut, 2015; Durgunoğlu & Öney, 1999; Güldenoğlu, Kargın & Ergül, 2016; Öney & Durgunoğlu, 1997) and poor readers (Babür & Abolafya, in preparation) in Turkish. However, these studies explored some variables of reading in normally developing children, but they did not give a sufficient and comprehensive explanation for the differentiation between poor and good readers on cognitive and linguistic variables. Therefore, this study bridges the gap to explain reading acquisition for poor and good readers covering phonological awareness, phonological memory and especially morphological awareness as cognitive and linguistic variables.

1.3 Purpose of the study

All in all, the purpose of the study is to investigate the role of cognitive and linguistic variables which differentiate poor and good readers in the second grade in the Turkish language. The result of the study is important (a) to show the skill(s) that

would have important role in reading acquisition in terms of reading types (b) to

identify children who need extra or different instructions in early grades and so that

these problems can be handled for the following grades. Also, the study may

contribute to enhancing reading curriculum for poor and good readers in terms of

cognitive and linguistic perspective.

1.4 Definitions of terms

Oral reading fluency: oral translation of text with speed and accuracy (Adam, 1990).

Phonological awareness: the ability to recognize, identify and manipulate any

phonological unit within a word (Ziegler & Goswami, 2005).

Rapid Automatized Naming (RAN): the ability to verbalize the name of visually

presented stimulus quickly and accurately (Denckla & Rudel, 1976a; 1976b).

Phonological memory: temporary storage verbal and acoustical information in

working memory (Brandenburg, et al., 2017).

Morphological awareness: the ability to consider and manipulate consciously the

smallest units of meaning in language (Apel, Diehm, & Apel, 2013).

CHAPTER 2

LITERATURE REVIEW

This study focuses on the cognitive and linguistic abilities in reading of poor and good readers and this chapter includes crucial elements of reading development. Firstly, how reading and reading fluency were defined in the field is presented. Then, as key predictors of reading; cognitive and linguistic abilities are reviewed. Specifically, recent research about phonological awareness (PA), rapid automatized naming (RAN), short term memory (STM) and morphological awareness (MA) are discussed in this chapter.

2.1 Reading and reading fluency

Reading is "the process of understanding speech written down" (Ziegler & Goswami, 2005, p.3). A person learns to read by forming connections between letters and sounds in the words (Ehri, 1992). Horowitz-Kraus, Schmitz, Hutton, & Schumacher (2017) explained the process of this connection as "translation of graphemes (letters) into corresponding spoken language sounds (phonemes)" (p.535). After forming associations between letters and sounds, it becomes automatic in time. How reading is learned is important for understanding both reading development and slowness or difficulties in reading.

In detail, the process of reading development is seen in phases or stages in the literature. Firstly, Chall (1983) states five stages from birth to adulthood. Before the first stage of reading, there is prereading process from the birth to the beginning of formal education (ages 0 and 6). Children learn to some insights into the nature of

words in that stage. After the acquisition of pre-reading skills, the first stage is

decoding. Children learn to decode words phonologically in the decoding stage (ages

6 and 7). Via decoding skills, they read for meaning in the fluency stage, which is the

second one (age 7 and 8 or Grade 1-2). In time, they develop the ability to read

fluently in the fluency stage. In the third stage, they read to learn the new knowledge,

information or experiences. Then, the children in high schools learn multiple

viewpoints of others in the fourth stage and later can decide what not to read and

what to read in the construction and reconstruction stage, which is the last stage (age

18 and above). Among these stages, the stages of decoding and fluency are most

relevant to the current study because learning to read occurs when a child is on the

decoding and fluency stages.

After Chall (1983), Frith (1985) proposed three phases of reading acquisition.

The first phase is the logographic phase in which a child reads a word by using

distinctive visual features. The second phase is the alphabetic phase during which the

child uses sound-letter correspondences in order to read. The orthographic phase is

the last one, in which the child recognizes a word with morphemic units.

Based on the Frith's (1985) phases of literacy development, Seymour (2006)

advocated the dual foundation model (Seymour, 2006). This model consists of

alphabetic knowledge, foundation literacy, orthographic literacy and morphographic

literacy. The alphabetic knowledge is the pre-literacy stage at which the children

learn the correspondence of letters with sounds. The foundation phase is the second

phase, and it consists of logographic and alphabetic process. While the logographic

phase is the process of accumulation of sight words in memory, the alphabetic

process is similar to decoding. The orthographic phase contains onsets and rimes,

while the morphographic phase includes syllables and morphemes to form the

representations of complex words. Actually, reading is acquired in the formation phase and later phases are required for fluent reading. Therefore, it can be said that fluent reading is based on accurate and rapid decoding of words.

Another theory of reading acquisition is the phase theory of sight word reading (Ehri, 2005). Ehri (2005) proposed four phases of reading which is defined as making connections between written words and their correspondence in memory. The first phase is the pre-alphabetic phase in which a child makes visual and contextual connections. The second phase is partial alphabetic in which the child makes connections between more salient letters and sounds. In the third phase, which is the full alphabetic phase, the child makes connections between all graphemes and phonemes. The last phase is consolidated alphabetic phase which is equivalent to the orthographic phase of Seymour (2006) when the child learns rimes and onsets and makes connections of words with rimes. Ehri (2005) argued that decoding skills are acquired in the third phase while it is gained in the formation phase in the dual foundation model of Seymour (2006).

Horowitz- Kraus, et al. (2017) explained the terms of reading acquisition in an order. According to them, decoding is the process of visualization of hearing a word. When decoding helps to recognize a word in total without thinking of each letter or sound, the orthography of a word is acquired. Then, the semantic process is defined as the relationship between the word read and the word in the spoken language. After the acquisition of these, reading becomes more fluent.

Similar to the stages and phases of reading acquisition, Hudson, Pullen, Lane, and Torgesen (2008) claimed a multidimensional framework of reading fluency. Hudson, et al. (2008) explained that reading fluency has hierarchal skills and knowledge of reading. They use the multilevel framework model for the assessment

of processes and sub-processes of reading fluency. According to this framework, reading fluency begins with phonemic awareness. After phonemic awareness, a child should have letter knowledge, phonemic decoding, orthographic knowledge and sight words in an order. Then, the child reads fluently. Also, processing speed and metacognition help to acquire reading fluency dimensions in each level.

All in all, the common point of these stages and phases is that reading is acquired in an order. First, there is a pre-literacy knowledge stage during which the child knows the visual feature of a word. Then, the decoding process during which sound-letter correspondences are learned is the most important acquisition of reading. After decoding, the child reads fluently with the acquisition of orthographic knowledge. During the semantic phase, the child learns the meaning of morphological units.

Among these theories of reading development, the dual foundation model of Seymour (2006) gives more comprehensive explanation from the pre-reading to semantic process. Therefore, the theoretical framework of the current study is based on the dual foundation model. This study may show in which stage poor and good readers are and whether they differentiate in these stages.

The reading developmental theories indicate that reading fluency is considered as the completion of reading acquisition. Oral reading fluency was defined by Fuchs et al. (2001) as:

a reader's perceptual skill at automatically translating letters into coherent

sound representations, unitizing those sound components into recognizable

wholes and automatically accessing lexical representations, processing

meaningful connections within and between sentences, relating text meaning

to prior information, and making inferences to supply missing information.

(pp. 239-240).

Fuchs et al. (2001) also stated that oral reading fluency is an indicator of overall

reading skills. Thus, studies about reading skills measured reading fluency with two

reading fluency tests: measurements of word reading and text- reading fluency. Text

reading fluency is to read words in a context while word reading fluency is to read

isolated words or words in a list (Kim, 2015). Text reading fluency is also defined as

"the ability to read a text quickly, accurately, and with the proper expression"

(National Reading Panel, 2000, p. 3-5). In general, reading fluency is built with

accuracy and rate in the reading literature (Pikulski & Chard, 2005; Hudson, Pullen,

Lane, & Torgesen, 2008).

Oral reading fluency is also used as a screening measurement. It is used to

evaluate reading performance, so any latency of reading performance is detected in

early grades. Hasbrouck and Tindal (2006) recommended that oral reading fluency

score is interpreted normal and grade- appropriate while the score falls within 10

words above and below the fifth percentile of the grade level for 2-8th grade in

English. Due to phonological, orthographic and morphological differences of

languages, the criterion cannot be used for Turkish. However, Erden, Kurdoğlu &

Uslu (2002) also used and recommended oral reading fluency as a screening

measurement in Turkish norms.

To conclude, this study uses the definition of oral reading fluency which is reading a text quickly and accurately. Also, oral reading fluency is measured for reading performance as a screening measurement. The next parts give the cognitive and linguistic perspective of reading in firstly normally developing children and then poor readers.

2.1.1   Cognitive and linguistic perspective to reading

Reading acquisition relies on some cognitive and linguistic skills. In cognitive terms, information processing involves processing, storage and retrieval of information. Reading acquisition requires an information processing. As mentioned in the previous part, the stages of pre-reading, decoding, orthographic and semantic occur with information processing. Thus, the influence of cognitive processes is explained in this section.

The term "phonological processing" should be defined for understanding cognitive parts of reading acquisition. Phonological processing refers "to use information about sound structure in progressing written and oral language" (Wagner & Torgesen, 1987). According to Wagner and Torgesen (1987), phonological processing has three main constructs. They are phonological awareness, rapid automatized naming and phonological loop of working memory. These dimensions work together in the acquisition of reading. Brandenburg et al. (2017) clarified that phonological processing model has phonetic analysis with PA, short term storage with PL and long term retrieval of language with RAN.

In contrast to Wagner and Torgesen (1987), Vaessen & Blomert (2010) argued that reading development requires two basic cognitive functions: phonological awareness (PA) and rapid automatized naming (RAN). As defined

previously in the introduction chapter, phonological awareness is related to phonological units of the word and rapid automatized naming measures naming speed. These two functions are important predictors of reading (Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997). Therefore, some studies showed that not only normal developing reading process (Parrila, Kirby, & McQuarrie, 2004) but also processing in poor reading (De Groot, Van den Bos, Van der Meulen, & Minnaert, 2017) can be explained by PA and RAN. Furthermore, phonological memory (PM) works with PA and RAN in the reading acquisition (Brandenburg, et al., 2017).

Moreover, mophological awareness is metalinguistic awareness (Fernandez & Cairns, 2011) and it attracts researchers' attentions recently. It is "the ability to consciously consider and manipulate the smallest units of meaning in spoken and written language" (Apel, 2017, p 11). In contrast to PA, RAN or PM, morphological awareness is related to semantics and the meaning of suffixes or affixes. According to the reading development theories discussed previously (e,g. Seymour, 2006), it can be said that morphological awareness is acquired after reading fluency. Therefore, morphological awereness can also differentiate poor and good readers (Koda, 2005).

In summary, phonological awareness, rapid automatized naming and phonological memory are especially important for the process of reading acquisition and reading fluency. In addition, morphological awareness is a further ability for reading fluency in understanding language.

2.1.2   Poor reading or reading difficulties

The term "poor reading" are used interchangeably with reading difficulties, reading disability, reading disorders, special learning disability, or learning problems in the

reading literature. Thus, the terms should be clarified for understanding what is poor reading.

Reading disorder is a clinical term under specific learning disabilities. Specific learning disorders generally defined as achievement in reading, math, or writing which is substantially below what would be expected for the child's age, schooling, and intellectual ability (Mash & Wolfe, 2002). Reading disorders involve impairments in word reading accuracy, reading rate or reading fluency, reading comprehension (American Psychatric Association, 2013). According to Diagnostic and Statistical Manual of Mental Disorders (DSM-5) which is the handbook of American Psychiatric Association for mental health professionals, children with reading disorders have difficulties in letter-sound correspondence, fluent word decoding and so their oral reading is slow, inaccurate and effortful.

On the other hand, every poor reader may not have reading disorders, but every child with reading disability has reading problems. They have similar difficulties, so determining poor readers is not easy. According to Stanovich and Siegel (1994), a child has reading disability if her verbal IQ score is above 80 and her performance on word recognition is below 25th percentile. A child is a poor reader when her performance on word recognition is below 40th percentile and verbal intelligence scores are between 70 and 96 (Hoskyn & Swanson, 2000). The two groups have similarities in phonological processing abilities (Hoskyn & Swanson, 2000). Therefore, the double deficit hypothesis will be discussed in order to explain the cognitive aspects of reading and poor reading.

The double deficit hypothesis was proposed (DDH) by Wolf and Bowers (1999). DDH holds that phonological awareness and RAN are separate skills for reading performance. According to Wolf and Bowers, there are three groups of

children who suffer from reading problems. The first group is children who have deficits in phonological processing and the second group involves children with deficits in naming speed. The last group is children who have double deficit as deficits in both phonological awareness and naming speed. Thus, it can be understood that not only phonological processing but also naming speed uniquely explain reading problems. As expected, reading impairment of children with double deficit is more severe than the other two groups.

Moreover, one criteria of reading disorders is low academic performance in terms of age (American Psychatric Association, 2013). Thus, teachers' grades and school reports are used for indicators of reading difficulties or poor reading in Turkey (Baydık & Ergül, 2012; Ergül, 2012; Seçkin-Yılmaz & Baydık, 2017). However, Ateş, Yıldırım, and Yıldız (2010) showed that classroom teachers do not have necessarily correct information on reading/writing disorders in Turkey. Although information from teachers may not show certain reading problems, they still are the first source of information about children because they can see the clues of reading difficulties and problems. Not only teachers' evaluations on reading skills, but also word recognition abilities are used to identify to poor readers.

Identifying of poor readers is very difficult, so poor readers are struggling readers or at-risk groups for reading difficulties. However, the prevalence of reading difficulties or poor readers is not known in Turkey but there are some studies that give different percentages of learning disabilities, so the prevalence of poor readers can be evaluated with the prevalence. Erden, Kurdoğlu, and Aysev (1999) stated that 10 to 20 percent of school age children have specific learning difficulties in Turkey. According to Demir (2005) 33.1% of children in the first grade are considered at-risk in learning disabilities according to data gathered from parents whereas data

collected from teachers shows that 24.8% of first graders are at-risk. Moreover, Doğan, Erşan, and Doğan (2009) found that around 37% of primary school children are at-risk for learning disorders. However, these percentages for specific learning difficulties or reading disorders are higher than the ones reported in reading literature, that is 5-15% among school age children across different languages (American Psychatric Association, 2013). Moreover, Bingöl (2003) explored developmental dyslexia in the second and fourth grades based on the data from teachers. In contrast to other studies, she found very low percentage (2.1%) for the second and (0.6%) fourth grade in developmental dyslexia. Despite the result of developmental dyslexia of Bingöl (2003), the other percentages of children with reading problems show that many children have difficulties in reading and they are poor readers but they may not have reading disorders.

2.2 The structure of the Turkish language

2.2.1 Phonological and orthographical properties of Turkish

There are 29 letters in the Turkish alphabet, 21 of which are consonants and eight letters are vowels. Each letter corresponds to one sound. Basically, the consonants are classified as strong consonants and soft consonants in terms of the vibration to vocal cords or not. Also, the vowels differ as with front/back.

To understand the Turkish orthographic and phonological structure, it should be examined on the orthographic dept hypothesis (Katz & Frost, 1992). According to Katz and Frost (1992) alphabetic orthographies vary depending on the consistency of mapping spelling and pronunciation according to orthographic dept hypothesis or script dependent hypothesis. In the shallow orthography, one to one letter- sound correspondence is in question; that is, each phoneme is corresponded by one letter.

For example, the letter "s" corresponds to the sound "sss" in Turkish. However there is an equivocal relation between letters and sounds in the deep orthographies. That is why a letter gains a new sound according to context. According to this explanation, Turkish has a shallow orthography because of correspondences between letter and sound. Durgunoğlu and Öney (1999) pointed that the correspondence between letters and sounds is almost one-to-one in Turkish, so the Turkish orthography is said to be perfectly transparent in contrast to English. Thus, each letter has only one phoneme. In the Turkish orthography, the context does not change the phonemic interpretation of a letter (Öney & Durgunoğlu, 1997).

Katz and Frost (1992) also stated that a word could be recognized in two ways. Firstly, the person could read the word on a visual basis by using recognition process like recognition of objects or symbols. Secondly, the reader could recognize the word by using the phonological codes with the awareness of correspondence of spelling and pronunciation. In the orthographic dept hypothesis, shallow orthographies suggest a phonological strategy due to correspondence of grapheme and phoneme. However, deep orthographies do not use phonological recoding because of inconsistency of spelling and pronunciation. Thus, the hypothesis holds that readers adapt their processing strategies in terms of characteristic of the language orthography.

With this word recognition strategy proposed by Katz and Frost (1992), it can be apparently said that Turkish has a shallow orthography since reading development of Turkish children is acquired with phonological decoding. Öney and Goldman (1984) examined the effects of grapheme - phoneme correspondences on reading acquisition. Their participants are first and third grade Turkish and American children. Due to the more regular letter-sound correspondence of Turkish, the

Turkish children learned more accurate and faster decoding in the first grade than American children. Likewise, Öney and Durgunoğlu (1997) investigated early reading development with phonologically transparent orthography of Turkish. They assessed phonological awareness, letter recognition, and word and pseudoword recognition in the first grade. They came up with the strong impact of the phonologically transparent orthography on early development of word recognition, and that phonological awareness contributes to word recognition.

These studies supported the orthographic dept hypothesis of Katz and Frost (1992) in two ways. The first support is the orthographic characteristic of Turkish language as shallow orthography which is always consistent to grapheme and phoneme. The second is that the structure of Turkish transparent orthography may contribute to word recognition by using the phonological code. The next part gives the morphological characteristic of Turkish.

2.2.2   Morphological characteristics of Turkish

Not only the orthography and phonological structure of Turkish, but also the morphological structure is important for understanding reading skills. Turkish is an agglutinative language, in Turkish suffixes are added to words. Suffixes that are used in Turkish are derivational and inflectional suffixes (Onan, 2009). Suffixes mark voice, aspect, modality, mood, person and number in nouns while they mark derivation, negation, tense, person, etc. in verbs (Durgunoğlu & Öney, 1999). In the Turkish language, the sequence of suffixes is consistent and stable. The derivational suffix can be added at the end of a base and then inflectional suffix is added to derived form of words. That can be shown as base + derivational suffix + inflectional suffix (Onan, 2009).

Gedizli (2012) explained that the derivational suffixes are used for composing new and permanent words by adding base or derived form of a word; however, inflectional suffixes are added to words temporarily and assign semantic and grammar meaning to words. In other words, derivational suffixes which are also called word formation, give the word a new meaning and the meaning of the base form changes with the derived form. On the other hand, inflectional suffixes carry such information as the tenses or pronouns; thus the word stays still as base form.

Moreover, the Turkish language is rich in derivational suffixes. There are almost two hundred derivational suffixes (Gedizli, 2012). Derivational suffixes may change the syntactic class of words that is grammatical category such as verb, noun, and adjective (Koda, 2005). In Turkish, there are four types of these suffixes: suffixes which make noun from verb; suffixes which make noun from noun; suffixes which make verb from noun; suffixes which make verb from verb (Karadağ & Kurudayıoğlu, 2010). Therefore, Turkish has class altering and class maintaining suffixes. To illustrate, yaz- (to write in English) is a verb, but yazı (writing in English) is a noun. The derivational suffix of /ı/ which is a suffix deriving a noun from a verb changes the meaning and syntactic class of the word. As stated, derivational suffixes are used to make a new word with a new meaning. Derivational suffixes for verb and noun are given in below.

To illustrate for derivational suffixes,

yaz (to write)- verb   kalem (pencil)- noun

yaz+ı (writing)- noun   kalem+li (to have pencil)- adjective/adverb

yaz+ı+lı (test)- noun   kalem+lik (pencil case)- noun

yaz+ı+cı (printer)- noun   kalem+siz (not having a pencil) adj./adv.

yaz+ar (writer)-noun

Moreover, the suffix can have some forms according to the word phonotactics. An example of phonotactics of suffixes, the suffix of /-lik/ has /-lık/, /-luk/, /-lük/ forms. Kalemlik (pencil case), çaydanlık (pot), suluk (water bowl), gözlük (eye glasses).

On the other hand, inflectional suffix adds the sense of pronouns and tenses to words in Turkish. That is, it does not make a new word but it only shows the persons, plurality and time. These suffixes have different usage when added to verbs and nouns. Noun inflectional suffixes are possessive pronouns, singular and plural suffixes, comparative suffixes, prepositions of nouns with dative, accusative, locative and ablative. For example,

Dative- okul (school)

Accusative- okul+u (to school)

Locative- okul+da (at school)

Ablative- okul+dan (from school)

Plural- okul+lar (schools)

Possessive pronouns – okul+um (my school), okul+un (your school), etc.

In addition to inflectional suffix of a noun, verb inflectional suffixes are pronouns and tense suffixes. For example,

Verb- almak (to take)

Past tense- al+dı (past tense suffix) +m (personal suffix) (I took)

Present tense- al+ır+sın (You take)

Future tense- al+acak+lar (They will take)

Taking into consideration all information about morphemes and the morphological structure of Turkish, it can be said Turkish language has a lot of suffixes. While derivational suffix derived from a word a new related word,

inflectional suffix shows persons, prepositions, plurality or time of the word. Keeping in the mind the impact of the phonological, orthographic and morphological properties of Turkish on reading fluency, Turkish studies about reading fluency is presented in the next section.

2.2.3   Reading fluency studies in Turkish

Studies about reading fluency in Turkey focused on the different issues. They varied from the norm formation of reading speed (Erden, Kurdoğlu, & Uslu, 2002; Gökçe-Sarıpınar & Erden, 2010) to the teachers' views about reading fluency problems of children with reading difficulties (Baydık & Ergül, 2012). Since reading difficulties or learning problems are new research areas in Turkey, the number of studies about fluency is limited (Baydık, Ergül & Bahap-Kudret, 2012; Gökçe-Sarıpınar & Erden, 2010; Ergül, 2012; Sidekli, 2010).

There was no standardized tests for assessing reading problems in Turkey, so Erden, Kurdoğlu and Uslu (2002) tried to establish a norm of reading speed for the first to fifth grades. They suggested that the results of their study can be used for an objective evaluation of academic performance in order to identify learning difficulties. In this study, there were 2572 students from first to fifth grade. They used reading passages according to grade levels. They resulted in forming a norm table for reading performance of children from first to fifth graders. In the norm table, the mean of a grade showed the numbers of words which is read in one-minute. As this study focused on the second graders, the mean of second graders is relevant to this study. They found that second graders read 73 words in one minute (μ=73.13, SD= 31. 16). They also found that there is a significant difference across grades. While first graders read 45 words in one minute (μ=45.30, SD= 27. 47), third

graders read 91 words (μ=91.46, SD= 31. 16) (Erden, Kurdoğlu, & Uslu, 2002). That is, students read faster as they grow as expected.

The norm of reading fluency in the second grade was supported by another study of Gökçe-Sarıpınar and Erden (2010). They studied with a large group that included 909 children in the first, second, third, fourth and fifth grade. According to the findings of the study, they also formed a norm table for all grades. While the first graders read 48 words in one minute (μ=48.17, SD= 15. 17), the second graders read 73 words (μ=73.37, SD= 26, 37). The result is congruent with previous research (Erden, Kurdoğlu, & Uslu, 2002). Moreover, Güneş (2000) stated that at the end of the academic year, a student in the first grade must read 60 words while a second grade student must read 80 words in one minute (Güneş, 2000).

In contrast to the norms in studies Erden, Kurdoğlu, & Uslu (2002) and Gökçe-Sarıpınar & Erden (2010), children may show lower performance than norms because of reading teaching method and socioeconomic background (Ateş & Yıldız, 2011; Ergül, 2012). Ateş and Yıldız (2011) explored the third-grade children reading performance in terms of reading learning method. They found that the mean of words read correctly was 75 (children who learn reading with sentence analyses) and 79 (children who learn reading with the sound based method). These two means were lower than the norms of third grade children in the previous research (91 and 88 words in one minute) (Erden et al, 2002; Gökçe-Sarıpınar & Erden, 2010). Ergül (2012) also investigated reading problems of third-grade children from low socioeconomic background. 112 students in the third grade participated in the study. The mean of word reading in one minute was 55.96 (SD=18.87) in total sample. The mean also was lower than the norms of third grade children in previous research. Therefore, it can be said that some children showed lower performance than grade-

appropriate, especially due to both reading learning method and low socioeconomic background.

Moreover, poor readers or children with reading difficulties showed different performance than their peers (Baydık, Ergül & Bahap-Kudret, 2012; Gökçe-Sarıpınar & Erden, 2010; Ergül, 2012; Seçkin-Yılmaz & Baydık, 2017; Sidekli, 2010). Gökçe - Sarıpınar & Erden (2010) examined differences in reading skills of children with reading disabilities and control group. Their participants are 64 normal and 64 reading disabled children who range from the first to fifth grades. In the study, they found that children with reading disabilities are significantly less successful in reading skills than their peers. They had lower scores in reading speed.

In addition to children diagnosed with reading disabilities, children with reading difficulties have lower performance in reading fluency. Ergül (2012) examined reading problems in the third grade. It was found that 13% of children have difficulties in reading among 112 children. In the study, while good readers read 68 words (SD= 15.70) in one- minute, children with reading problems read 44 words (SD= 16.96) accurately in one minute. Although the two groups' means were lower than the earlier norms of third grade children. (91 and 88 words in one minute) (Erden et al, 2002, Gökçe-Sarıpınar & Erden, 2010), there was a significant difference between good readers and children with reading difficulties.

Baydık, Ergül and Bahap-Kudret (2012) explored reading fluency problems of children with reading difficulties based on the data from classroom teachers. Teachers observed that most children (64.8%) with reading difficulties have accuracy problems. The most commonly observed problem was that the children read words ignoring punctuation marks (72.4%). Also, automaticity (52.4%) was another reading problem which the children experience. The researchers found that children with

reading difficulties have difficulties of these three dimensions of reading fluency (accuracy, automaticity and prosody). As similar to the study, Sidekli (2010) found that children with reading difficulties in the fourth grade have accuracy problems. These children did not read the text according to the grade level and proper expression.

Recently, Seçkin-Yılmaz and Baydık (2017) conducted a study about oral reading fluency in the third grade children. They divided their sample into two groups: children with or without low oral reading fluency. They found that children with low oral reading fluency read fewer words accurately than other group.

In conclusion, the studies on reading fluency have been growing for last two decades in Turkey. Erden et al. (2002) tried to form a grade-appropriate norm as a result of the evaluation of reading performance of children. Then, few researchers focused on reading fluency of poor readers and children with reading difficulties. However, many studies on poor readers and their problems in reading are needed to learn which cognitive and linguistic variables affect their reading. In later sections of this chapter, the cognitive and linguistic variables of reading are given in terms of normal reading development and poor reading.

2.3   Phonological awareness

Phonological awareness is defined differently but generally it means "one's degree of sensitivity to the sound structure of oral language" (Anthony & Francis, 2005, p. 255). It is also defined as "the ability to recognize, identify and manipulate any phonological unit within a word" (Ziegler & Goswami, 2005, p.4).

Phonological awareness skills are acquired with a general sequence (Anthony & Francis, 2005). According to Anthony and Francis (2005), firstly, children can

deal with smallest part of the words. That is, children can detect and manipulate

firstly the syllable, then onset and rime and lastly phonemes within intrasyllabic

word units. Secondly, children can deal with the sounds within words after they

detect the similar or different sounding words and also they can segment the

phonological information after being able to blend it. Finally, children can reorganize

their phonological awareness skills with new phonological information.

Likewise Anthony and Francis (2005), Schuele & Boudreau (2008) suggested

a specific sequence of phonological awareness skills in complexity level. They

claimed that phonological awareness starts with learning the ability of words into

syllable, rhyme, sorting initial and final sounds. Then, phonemic awareness, is the

complex level of phonological awareness, is acquired. Phonemic awareness develops

with the sequence: onset-rime segmentation, segment initial and final sounds,

blending sounds into words, segmentation words into sounds, and delete, manipulate

phonemes. The most important acquisition in the phonemic awareness as early

literacy success is segmentation of words into sounds.

Moreover, the development of phonological awareness was compatible with

Chall's (1983) stages of reading development. Chall (1983) mentioned that children

at first and second grade must acquire phonological analysis, segmentation and

synthesis in a single word. Therefore, it can be said that a child learns phonological

knowledge during the reading acquisition.

After the definition and development of phonological awareness, the

ingredients of phonological awareness should be explained. According to Wagner,

Torgesen and Rashotte (1994) phonological awareness contains phonological

analysis and phonological synthesis. Phonological analysis includes elision and

segmentation of phoneme while phonological synthesis assesses blending abilities. In

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specifically, phonological analysis is measured with syllable and phoneme levels. Syllabic awareness means to be able o divide a word into syllables while phonemic awareness refers to the awareness of the word composed with sounds (Gillon, 2007). For example, the Turkish word "kedi"(cat) has two syllables /ke/, /di/ in the syllabic level and composed of the sounds in that order /k/, /e/, /d/, /i/ in the phoneme level.

Based on tasks divisions of Wagner, Torgesen and Rashotte (1994) and Gillion (2007), the current study assesses phonological awareness in both syllabic and phoneme level. Phonological awareness contains deletion and segmentation tasks of syllable and of phoneme as phonological analysis abilities. Also, syllabic and phoneme blending abilities as phonological synthesis are measured in the study. To clarify tasks in the study, the explanations and examples of elision, segmentation and blending tasks are given below.

Firstly, in the elision task, syllable elision means the ability to delete a certain syllable in a multisyllabic word, but phoneme elision is the ability to delete a certain phoneme in a word. For example, the Turkish word "okul" means school. The word has two syllables (/o/, /kul/). In syllable deletion, after deletion of the syllable /kul/, the remaining word is "o" (it). Similarly, in the deletion of phoneme, only the sound /l/ is asked to delete, and the remaining word is "oku" (read). Secondly, in the segmentation ability tasks, syllable segmentation refers to the ability to identify the syllables in a word and phoneme segmentation is to measure the ability to identify the phoneme in a word. To illustrate, the child is asked to segment the word into syllables /o/ and /kul/ in the syllable segmentation when the answer should be the sounds /o/, /k/, /u/, /l/ in the phoneme segmentation. Lastly, while syllable blending refers to the ability to combine separate syllables to form a word, phoneme blending means the ability to combine separate sounds to form a word. For instance, the

examiner says "o" and "kul" with a certain pause, the child should say the combination of syllables "okul" in the syllable blending. However, in the phoneme blending, the examiner says all sounds separately like /o/, /k/, /u/, /l/, and the child should say "okul" gathering the sounds in the mind. As seen, the segmentation tasks are reverse of blending and vice versa. With these explanations of tasks, this study was aimed to measure comprehensive aspects of phonological awareness. The next parts give the relationships between phonological awareness and reading fluency with some studies.

2.3.1   Phonological awareness and reading fluency

Phonological awareness is important in early reading (Bee, 2000; Feldman, 2004). Anthony and Francis (2005) emphasized that phonological awareness is strongly related to literacy acquisition. They claimed that individuals who are poor in identifying sounds within words will also have difficulty in learning to read. Gray and McCutchen (2006) found that phonological awareness had a significant relationship with word reading not only in the kindergarten (r=.70, p<.01)) but also in the first and second grade (r=.37, p<.01). According to the results, relationship between the two is strong in the beginner readers. However, in another work, Torgesen, Wagner, Rashotte, Burgess, & Hecht (1997) found that phonological awareness in both second and third grades make a unique contribution to a variety of reading skills of the following two years, that is fourth and fifth grades in longitudinal study.

In addition, phonological awareness has a strong relationship with reading accuracy (Juul, Poulsen & Elbro, 2014; Oakhill & Cain, 2012). Oakhill and Cain (2012) looked for the predictors of reading skills in a longitudinal study. They

followed 83 children with ages from 7- 8 years to 10-11 years. In the result, they found that phonemic awareness is a predictor of the later word- accuracy performance. Juul, Poulsen and Elbro (2014) also found that phoneme awareness was a strong predictor of accuracy. They examined reading skills (RAN and phonological awareness) from kindergarten to second grade. In the result, phoneme awareness strongly predicts the accuracy of word recognition skills of the second grade.

Furthermore, phonological awareness skills are related to reading difficulties (Compton, DeFries, & Olson, 2001; McBride-Chang, Liu, Wong, Wong, & Shu, 2012; Savage & Frederickson, 2005). McBride-Chang, et al. (2012) examined the cognitive skills of poor readers in English, of poor readers in Chinese and of poor readers in both languages with of a control group. All groups of poor readers showed the lower performance on phonological awareness than readers who went through a normal development process in a four-year longitudinal study. In addition, Savage and Frederickson (2005) found that phonological processing tasks (phonological awareness, rapid naming and phonological memory) predicted reading accuracy and comprehension in the poor readers. Compton et al. (2001) explored double deficits hypothesis in a large group of children with reading disabilities. Their participants were 476 children with RD. As a result, phonological awareness proved to be a unique contributor to reading.

Despite the difference in phonological properties of languages, phonological awareness predicts reading in many languages (McBride-Chang, et al., 2005; Moll, et al., 2014). McBride-Chang, et al. (2005) investigated variables that have associations with reading across four languages in second graders. They found that phonological awareness predicts reading in English and in Korean (McBride-Chang, et al., 2005). In addition, Moll, et al., (2014) showed that phonological awareness has a unique

contribution to reading skills in five languages: English French, German, Hungarian and Finnish. As a result, they concluded that phonological awareness with phonological memory predict higher amounts of unique variance of reading accuracy in the second grade. As a result, studies show that phonological awareness is related to reading fluency in many ortographies. The next part explains the relationships between phonological awareness and reading in the Turkish language as a tranparent ortography.

2.3.2   Phonological awareness studies in Turkish

Studies about phonological awareness and its effects on reading acquisition have begun to increase in the last two decades. The study of Öney and Goldman (1984) about the effects of Turkish phonological transparent orthography on reading acquisition paved the way for phonological awareness research. Then, Öney and Durgunoğlu (1997) looked at the relationships between reading and phonological awareness skills. They used phoneme deletion, phoneme blending, syllable blending, phoneme segmentation, syllable segmentation and selecting a rhyming word as phonological awareness tasks. They found that phonological awareness contributes to word recognition in the first grade.

Another study of Durgunoğlu and Öney (1999) is a comparison about phonological awareness across Turkish and American students in the preschool and first grade. They used tasks of syllable and phoneme segmentation, and of initial and final phoneme deletion. They firstly found that phonological awareness increases when children become literate. They also argued that Turkish children are more successful in all phonological awareness tasks because of the transparent orthography of Turkish.

The relationships between phonological awareness and reading were investigated in longitudinal studies from preschool to second grade (Babayiğit & Stainthorp, 2007; Güldenoğlu, Kargın & Ergül, 2016). Firstly, Babayiğit and Stainthorp (2007) examined whether preschool phonological awareness makes a contribution to subsequent reading skills. They used phoneme and syllable deletions, ryhme awareness, syllable tapping, onset awareness. Their participants were 56 preschool children and they followed them for two years. However, they found that preschool phonological awareness was not a significant predictor of later reading.

Another longitudinal study about preschool phonological awareness skills' influences on reading in first grade resulted differently. Güldenoğlu, Kargın and Ergül (2016) measured phonological skills of 85 students in the kindergarten and then examined word reading in the first grade. They found that students with poor and proficient phonological skills have similar performance of word reading accuracy whereas the proficient ones have better performance in reading fluency.

Moreover, Karakelle (2004) examined whether phonological awareness with letter knowledge affect reading fluency in the first grade. In the study, the participants were first graders. Letter knowledge and phonological awareness skills were measured at the beginning of the year but their reading fluency was tested at the end of the year. In this study, phonological awareness consisted of rhyming, phoneme deletion, phoneme blending and syllable blending. The findings of the study showed that children who can recognize and name letters with high phonological awareness read more fluently than children who fail in these tasks or succeed in only one of them. It was found while reading fluency was predicted by letter naming and phonological awareness separately; letter knowledge and phonological awareness skills together have strong affect in reading fluency.

In addition to the study of Karakelle (2004), Erdoğan and Erdoğan (2010) examined the level of the first graders on phonological awareness. In this study, phonological awareness was measured with tasks of "realizing that words are composed of syllables", "realizing that words can be rhymed", "realizing that words can start with the same phoneme" and "realizing that words can end with the same phoneme". They found that first grade students who took preschool education proved to be in the medium level in all subscale of phonological awareness test.

Recently, Özata, Babür and Haznedar (2016) studied phonological awareness in monolinguals and bilinguals in Turkish and English. Their participants were 16 Turkish and 16 English monolinguals and 50 bilinguals. It was found that phonological awareness is the powerful predictor of word reading in Turkish.

In summary, there are many studies which showed the relationships between phonological awareness and reading in not only other languages but also Turkish. Despite the studies in Turkish about the relationships between reading fluency and phonological awareness in the first grade (Gündenoğlu, Kargın and Ergül, 2012; Karakelle, 2004), there is one single study (Babayiğit & Stainthorp, 2007) about the relationships in the second grade which resulted differently. Also, there is no study which investigates phonological awareness of poor readers or reading difficulties in Turkish as a transparent language.

2.4   Rapid automatized naming

Another important element of reading development is automatization. Rapid Automatized Naming (RAN) is defined as the ability to verbalize the name of visually presented stimulus quickly and accurately (Denckla & Rudel, 1976a; 1976b). Wagner and Torgesen (1987) mentioned RAN as phonological recoding in

lexical access in phonological processing. They defined RAN as recoding written symbols in sound-based representational system to get from written word to its lexical referent. RAN is to measure efficiently retrieval skills of participants from long term memory in phonological representation of words (Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997).

The original RAN and Turkish RAN have four tasks: objects, colors, numbers and letters. In RAN tasks, participants name objects, colors, numbers and letters quickly and accurately, and duration of naming is scored as RAN performance. Digits/numbers and letters are alphanumeric stimuli while colors and objects are non-alphanumeric ones. Alphanumeric stimuli are strongly related reading fluency than non-alphanumeric (Wagner, Torgesen, & Rashotte, 1999). Therefore, this study uses alphanumeric stimuli of RAN for seeing relationships between RAN and reading fluency and the next part gives the relationships between RAN and reading fluency.

2.4.1 RAN and reading fluency

Although RAN was seen under the phonological processing umbrella (Wagner & Torgesen, 1987), recent studies showed that RAN has a unique contribution to reading fluency (Georgiou, Aro, Liao, & Parrila, 2016; Liu & Zhu, 2016; Papadopoulos, Spanoudis, & Georgiou, 2016).

A vast variety of studies exhibited that rapid naming is an independent factor from phonological awareness of reading development for supporting the double-deficit hypothesis (Compton, DeFries, & Olson, 2001; Georgiou, Aro, Liao, & Parrila, 2016; Moll, et al., 2014; Plaza & Cohen, 2003; Powell, Stainthorp, Stuart, Garwood, & Quinlan, 2007; Wolff, 2014). Plaza and Cohen (2003) examined the relationships among rapid naming, phonological awareness and syntactic awareness

in the first graders. They found that these variables are predictors of reading and spelling. Regarding the tasks of RAN, they used the picture, digit and letter naming. As a result, letter naming had the highest correlation with reading among the tasks. Likewise, Powell et al. (2007) made a study with the tasks of RAN, phonological awareness and reading in order to see their relationships. They conducted the study with more than a thousand children who are from seven to ten. The findings showed that children exhibited RAN deficits in the absence of deficits in phonological awareness. Also, they showed that children with double deficits were the poorest readers. Thus, the researchers advocated that naming speed is a different element from phonological processes and naming speed processing may pose a second key difficulty in reading and spelling.

Reading fluency and rapid naming is highly related in children with reading difficulties (Compton, DeFries, & Olson, 2001; Cornwall, 1992; DeGroot et al., 2017; Katzir, et al., 2006; Savage & Frederickson, 2005; Vaessen, Gerretsen, & Blomert, 2009; Wolff, 2014). Savage & Frederickson (2005) investigated the relationship between the rapid naming and text reading speed in poor readers. They resulted in reading accuracy and rate was predicted by rapid digit naming. Digit naming was significant predictor of reading rate after controlling accuracy. Also, Katzir, et al. (2006) demonstrated the rapid letter naming contributed to a text reading speed and accuracy scores in children with reading disabilities. Therefore, it can be said that text reading fluency has a significant relationship with rapid digit and letter naming in poor readers.

In addition to these studies, Vaessen, Gerretsen, & Blomert (2009) investigated the double deficits hypothesis in children with dsylexia. They found that rapid naming was related to reading speed in reading disorders. Similarly, rapid

naming has a unique controbution to reading in children with reading disabilities in the study of Compton, et al. (2001) who also examine the double deficit hypothesis. Recently, Wolff (2014) explored RAN as a predictor of the reading speed in reading difficulties. The researcher followed 112 children with reading difficulties in a longitudinal intervention study. It was found that RAN predicts the reading speed in children with reading difficulties and also there is reciprocal relationship between RAN and reading speed in children with reading difficulties.

Moreover, there are some studies about relationships between reading speed and RAN across different orthographies. Georgiou, Aro, Liao, and Parrila (2016) explored the relationships between RAN and reading skilss in three languages: English, Chinese and Finnish. They found that RAN has the strongest prediction of reading fluency in all languages. In addition, Moll, et al., (2014) looked for the effects of RAN in reading fluency in English, French, German, Hungarian, and Finnish. According to the results, RAN was the best predictor of reading speed in all ortographies.

Recently, Georgiou, Parrila, Cui, and Papadopoulos (2013) pointed out RAN is related to oral reading fluency in Greek. Their participants were 65 second graders and 65 six graders. It was found that only digit naming explained reading fluency within RAN subtests in both grade. Liu and Zhu (2016) showed RAN explains reading fluency and reading accuracy uniquely in Chinese language after controlling some characteristics (age, vocabulary, non-verbal IQ). They looked for phonological awareness, RAN (digit), morphological awareness in 128 third and fifth graders. They found while phonological awareness has a unique contribution to spelling, RAN still has a significant effect on reading fluency after controlling reading accuracy. Therefore, RAN may have different cognitive processing from

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phonological awareness on the reading fluency in many languages. In the next part, studies about rapid naming in Turkish are presented.

2.4.2   RAN studies in Turkish

Although RAN as a reading skill is remarkable in the reading literature since the last few decades, it is a new research area for Turkish literacy development. Firstly, Bakır and Babür (2009) adapted the RAN tasks into Turkish. They measured the reliabilities and validities of the RAN. After the adaptation of the test, some studies are made to investigate the relationship between reading and RAN.

According to the results of studies, it was found that RAN is the most significant predictor of reading fluency in Turkish (Babayiğit & Stainthorp, 2010; Babayiğit & Stainthorp, 2011). Babayiğit and Stainthorp (2010) followed 57 first grade children in one year longitidunal study in order to see the predictors of reading fluency in Turkish. They found that RAN is consistent and the most significant predictor of reading fluency in longitudinal aspect. (Babayiğit & Stainthorp, 2010) In addition, Babayiğit and Stainthorp (2011) made another research about cognitive and linguistic skills of children in the second and fourth grade Turkish children. They followed these children for a year. The findings showed that again RAN is the most significant predictor of reading fluency in all grades (Babayiğit & Stainthorp, 2011).

Moreover, Babür and Abolafya (in preparation) examined the relationships between RAN and other reading skills in poor and good readers. Participants of the study were 118 second grade students. The findings showed that there are significant differences in RAN numbers and letters between poor and good readers. That means poor readers had difficulties in rapid naming. In addition, the relationships between RAN and other reading skills were found to be different in the two groups. In the

poor readers, RAN numbers correlated with RAN letters and with oral reading fluency. In contrast, in the good readers, RAN numbers and letters had not any correlation with reading fluency. In conclusion, it can be said that RAN may differentiate poor readers from good readers in Turkish, but more studies are needed to ensure the relationships between RAN and reading fluency.

In summary, in contrast to the phonological processing model, most studies showed that RAN independently works in reading fluency from phonological awareness and it is found as a significant predictor of reading fluency as well as phonological awareness. The last skill of phonological processing, is phonological memory, which will be handled in the next part.

2.5   Phonological memory

The last phonological processing construct is phonological loop in working memory. Working memory is "the ability to process and store information simultaneously" (Daneman, 1991). Similar to the definition of working memory, phonological memory was defined as "temporary storage verbal and acoustical information in working memory" (Brandenburg, et al., 2017). Brandenburg et al. (2017) explained the role of phonological memory in reading as: When a child reads a sentence, phonological loop keeps acoustical representation of words in memory. Daneman and Carpenter (1980) also stated that fluent reading activates a stored neural model that executes fast reading and correct pronunciations with understanding of the word. To measure phonological memory or verbal short term memory, generally the task of digit span is used (Wagner, Torgesen, & Rashotte, 1994).

2.5.1 Phonological memory and reading fluency

Phonological memory and reading are related (Gray & McCutchen, 2006). According to Gray and McCutchen (2006), the experienced readers (first and second graders) have higher perfomance on phonological memory than kindergarden children as novice readers. They used ryming and not ryming word list recall for measuring phonological memory. They also found that word list recall is significantly related to word reading in kindergarden (r=.32) and in experienced readers (r=.37).

Although phonological memory is related to reading, it does not have significant unique variance to reading (Parrila, Kirby, & McQuarrie, 2004). Parrila, Kirby and McQuarrie (2004) investigated longitudinal predictors of reading with kindergarden throughtout the third grade. They found that verbal short term memory (word span repetition) does not uniquely contribute to reading variance when phonological awareness and rapid naming were controlled in all grades.

Not having unique contribution to reading may come from the effects of working memory on relationships between reading and RAN. Papadopoulos, Spanoudis, and Georgiou (2016) studied RAN and oral reading fluency relationships in a longitidunal aspect. They followed children from the first grade to second grade. They found that working memory (word span) has a significant role in the relationship between RAN and reading fluency. Related to this result, Plaza and Cohen (2003) also showed the relationships between short term memory and rapid naming tasks. The findings showed that word span is correlated only with picture naming and digit span is correlated with only letter naming. Thus, it can be said that phonological memory and oral reading fluency are related either directly or indirectly.

Moreover, poor readers have low perfomance on working memory tasks. Swanson and Howard (2005) found that not only poor readers but also children with reading difficulties perfomed similarly low range in working memory (ryming/ digits). Similarly, Carroll, Solity, and Shapiro (2016) recently showed verbal short term memory (digit span and non-word repetition) with PA and RAN are good predictors of poor reading. They studied with 267 children at 4 years old and followed them in 2, 3 and 4 years later. They found that poor readers do not suffer from one deficit and they have more than one area in phonological processing abilities.

In addition, Brandenburg, et al. (2017) examined phonological processing elements (PA, RAN, PM) in children with reading disorder and with normal reading in the third grade. They used word span and digit span tasks for meausuring phonological memory. They found that PA, RAN and PM predict reading in both groups in German languages. As they examined the relationships of contrusts in both groups, they found that phonological awareness and phonological memory has significant relationships in medium range (Brandenburg, et al., 2017).

Overall, although some studies demonstrated that phonological memory and reading have indirect relationship, most studies showed that phonological memory has relationships with reading fluency in English and also in Germany with phonological awareness and RAN. The next part also covers studies about phonological memory in Turkish.

2.5.2   Phonological memory studies in Turkish

There are some inconsistencies between the findings of studies about the relationship of verbal short term memory with reading fluency in Turkish. For example,

Babayiğit and Stainthorp (2007) measured short term memory with word span and forward digit span. They showed that short term memory in preschool is the most prowerful and significant predictor of future reading skills in a two-year longitudinal study. In speficically, forward digit span has the highest correlations with text reading speed in all time periods. However, the same researchers investigated the cogntive and lingusitic skillls of reading in children at second grade and fourth grade (Babayiğit & Stainthorp, 2011). They also followed these students for a year and they used only digit span in measuring short term memory. It was found that short term memory and reading fluency are not interrelated in this longitudinal study.

The first study in reading disability and phonological memory in Turkish was conducted by Kesikçi and Amado (2005). They examined phonological memory in children with reading disabilities. They compared children with reading disabilities to control group in non-word phonological memory, short term memory and VISC-R subtests. They selected 49 children with RD and 49 children who were matched according to age, gender and socioeconomic status. As a result, they found that RD group made more errors in phonological memory and had lower score in digit span and WISC-R verbal subtests.

In addition to this study, Tercan, Kesikçi and Amado (2012) investigated to phonological storage process in children with reading disability and two control groups, which are verbal groups and performance groups according to WISC-R subtests. Their participants are 19 children with 6- 14 ages in each group. They used word and sentence repetition as phonological memory measurements. The findings showed that children with reading disabilities show poorer performance on both phonological memory measurements than the two groups.

To sum up, studies in Turkish indicated while no relationship was proved to be between reading and phonological memory in normal readers, children with reading disabilities have lower performance on phonological memory. However, there is no study to examine the relationship between phonological memory and reading fluency in poor readers.

To conclude, the ingredients of the phonological processing model have been discussed so far, but the next section is about the morphological awareness as a linguistic variable.

2.6   Morphological awareness

Morphological awareness refers to the ability to consider and manipulate consciously the smallest units of meaning in language (Apel, Diehm, & Apel, 2013). Morphological awareness focuses on children's conscious awareness of the morphemic structure of the words and their ability to reflect on and manipulate that structure (Carlisle, 1995). In a sense, it is children's knowledge about morpheme and their functions to give meanings to the words, so morphological awareness is one of the metalinguistic awareness which is to think and learn consciously about sounds, words and sentences with other language components (Fernandez & Cairns, 2011) That means, children learn rules and principles of language and they can recognize the violations of these.

Morphological awareness is handled in three types: inflectional morphology, derivational morphology and compound. Kuo and Anderson (2010) defined inflectional morphemes "mark syntactic or semantic relations between different words in a sentence without altering the meaning" (p.163). However, the derivations include the change in meaning of base with a morpheme and compounding is formed

as a new word by merging two or more words or roots (Kuo & Anderson, 2010). The current study was used for two types of morphological awareness: derivational and inflectional morphology.

In detail, inflectional suffixes do not change the word form and the word can be predicted easily with the knowledge of suffixes and stem. For instance, "okul" (school in English) is a noun and "okulum" (my school) is still a noun with the added /um/ suffix that makes sense of the first person possessive pronoun.

On the other hand, derivational suffixes give a new meaning and often a new syntactic class to a word (Marslen-Wilson, Tyler, Waksler, & Older, 1994). According to Koda (2005), there are two derivational affixes: class altering and class maintaining affixes. To illustrate for class altering suffix, "oku-mak" (read in English) is a verb, but "okul" (school) is a noun with the added /-l/. That is, the word gains a new meaning and a new syntactic class. The suffix derives a verb from a noun. However, "kalem" (pencil) is a noun and "kalemlik" (pencil case) also becomes a noun when /-lik/ is added, as a suffix noun-making from a noun. This suffix is a maintaining suffix because it does not change the grammatical category of the stem and derived forms are still nouns.

After the definitions and explanations of the terms about morphological awareness, the relationship between reading fluency and morphological awareness is given in the next section.

2.6.1   Morphological awareness and reading fluency

The awareness of morpheme is important for understanding and using language, specifically for early years of the school (Carlisle, 1995; Carlisle, 2003; Casalis & Cole, 2009). Carlisle (1995) found that morphological awareness is significantly

related to reading achievement. In the study, first graders showed significantly better performance on the morphological awareness task, but kindergarteners had difficulty in it. In longitudinal aspects, first graders' performance on morphological and phonological tasks indicated a significant impact of the second-grade word analysis.

Since morphological abilities are related to the meaning of words, there are many studies which focused on morphological awareness and reading comprehension (Carlisle & Fleming, 2003; Deacon & Kirby, 2004; Gilbert, Goodwin, Compton, & Kearns, 2014; Tong, Deacon, Cain, Kirby, & Parrila, 2011). Tong, Deacon, Cain, Kirby, and Parrila (2011) found that morphological awareness is related to reading comprehension in the fifth grade throughout the third grade in a longitudinal study. They also showed that poor morphological awareness has an effect on difficulties in reading comprehension. In addition, Gilbert, Goodwin, Compton and Kearns (2014) exhibited that reading multisyllabic word moderates on the relation between morphological awareness and reading comprehension of the fifth grade students. Although the relationship between morphological awareness and reading comprehension is significant for reading development, the current study does not focus on reading comprehension. It is just interested in the relationship between reading fluency and morphological awareness.

Stolz and Feldman (1995) proposed that morphology is important to visual word recognition. In their study, skilled reader can decompose a word by using the component morphological structure of a word; not orthography, phonology or semantics of the word. Similarly, Carlisle and Fleming (2003) found that third grade morphological awareness is higher than first grade students. On the other hand, not only an advantage of later grades, but also morphological awareness is an important skill for differentiating poor and good readers (Koda, 2005). As supporting Koda's

(2005) claim, it was found that good readers are more proficient in morphological awareness tasks than poor readers in derivational morphology (Duncan, Gray, Quemart, & Casalis, 2010).

In parallel to above studies, Carlisle (2010) made a review of sixteen studies about morphological awareness and literacy development. The review was generally focused on phonology, orthography and word meaning. As expected, the studies showed that morphological awareness may contribute to students' literacy development in phonological, orthographical and meaning of written words (semantic) in English.

A few researchers supported the idea that the morphological awareness is a component of learning to read and that morphological skills affect reading abilities with difficulties in various languages: in French (Casalis & Cole, 2009; Fejzo, 2016), in Greek (Pittas & Nunnes, 2014; Rothou & Padeliadu, 2015), in Chinese (Yeung, Ho, Chan, & Chung, 2014; Liu & Zhu, 2016) and in Korean (Kim, 2015). Not only the differences in the orthographies of languages but also how to learn reading and spelling through morphology awareness are essential to understand the morphological awareness in different languages.

In French, Casalis and Cole (2009) investigated the relationships between morphological and phonological awareness on reading of kindergarteners and first graders with a training of them. They stated that there are three structures in French morphology as derivational morphology, inflectional morphology and compound noun composition. They focused on derivational morphology with a transparent characteristic of French. They found that high morphological awareness means high phonological sensitivity. While morphological awareness training had an effect on reading in the kindergarten level but not in first grade, phonological awareness

training improved in reading in first grade. Other research about morphological awareness in French also concentrated on only derivational morphology (Fejzo, 2016). Fejzo (2016) examined the morphological awareness and spelling of morphemes with morphologically complex words in the third and fourth grade. The findings showed that higher level of morphological awareness has a significant relationship with spelling of morphemes.

In addition, Pittas and Nunes (2014) looked for the relationships between morphological awareness, and reading and spelling in Greek (as a transparent/consistent language) in a longitudinal study. The participants of the study were 404 children with six ages. The researchers used "judgment of pseudo-word inflection" as noun inflectional morphology measurement, "morphological relatedness task" to measure derivational morphology or semantic judgment and "sentence analogy task" to measure verb inflectional morphology using transformation. They found that morphological awareness is the only contributor of reading and spelling in concurrent analysis but it predicted only reading performance in a long term. In addition, Rothou and Padeliadu (2015) explored the relationship between inflectional morphology (noun-adjective inflection and verb inflection) and word reading with reading comprehension in the first, second and third grade in Greek. The inflectional tests were given orally. As a result, noun-adjective inflectional morphology contributed significantly to decoding in the first grade, but verb inflection contributed to reading comprehension in the third grade. However, reading skills in the second grade were not predicted by inflectional morphology.

McBride-Chang, et al. (2005) examined whether reading has relation with morphological awareness across a few languages. They found that morphological awareness has a unique contribution to reading in Chinese and Korean, not in

English (McBride-Chang, et al., 2005). After that, Yeung, Ho, Chan, and Chung (2014) investigated the indicators of persisting reading difficulties with a 3 years longitudinal study in the first and fourth grade in Chinese elementary students. They looked for reading related measures and they found that morphological and syntactic skills as oral language skills were important indicators of early word reading difficulty. Moreover, Liu and Zhu (2016) found that morphological awareness in Chinese had a unique contribution to reading accuracy and reading fluency in the third and fifth grade. Furthermore, Kim (2015) studied reading fluency skills of Korean speaking children with almost a two-academic-year longitudinal study. The participants were 143 children who are five years old. The results of this study showed that text reading fluency is related to grammatical awareness.

In conclusion, morphological awareness is an important skill for reading development. Also, tasks of morphological awareness vary according to morphological structure of a language. Grammatical awareness, syntactic awareness, inflectional and derivational morphology were used for measurements of morphological awareness. The next part presents studies about morphological awareness in Turkish as an agglutinative language.

2.6.2   Morphological awareness studies in Turkish

In parallel to studies about exploring in transparent languages (ex. in Greek, Pittas & Nunes , 2014 etc.), there is a growing literature about morphological and grammatical awareness in Turkish as a transparent and agglutinative language in the last decade.

The comprehensive study of Karadağ and Kurudayıoğlu (2010) examined the impact of derivational morphological structure of Turkish language on writing skills

in elementary students. They chose 500 frequently used words for each eight grades. Then, they analyzed morphological structures of the 4000 words. As a result, 315 words out of 715 have derivational morphemes. Also, it was found that 44 different derivational suffixes are used in all grades. Moreover, there were 22 morphemes with suffixes which make noun from verbs. It can be said that the most frequent suffixes are the ones making nouns from verbs. This study was very important to show which derivational suffixes are frequently used in all elementary grades.

On the other hand, Babayiğit and Stainhorp (2010) investigated inflectional morphology with nonwords grammatical judgment. Babayiğit & Stainthorp (2010) defined grammatical awareness as "the ability to process morphological and syntactic structure of spoken language" (p.540). It was a two- year longitudinal study from grade 1 to grade 2. They used the two tasks for measuring morphological awareness: grammatical judgment of the sentences, and judgment with the correction of the wrong sentence. It was found that grammatical awareness is not a predictor of reading skills but is the unique contributor of word spelling in a longitudinal aspect.

Moreover, Batur and Beyret (2015) have conducted a new study about the correlations of the meta-linguistic awareness skills such as phonological, morphological, semantic and syntactic awareness between writing skills in middle school students. They chose fifteen students in each grade in fifth, sixth, seventh and eighth grade. They used inflectional and derivational suffixes in the morphological test. In the morphological awareness test, students are asked to write the appropriate form of the given word in a sentence. They found that students with high awareness skills have also high writing skills; and students with low writing skills have also low awareness skills. Generally, when metalinguistic awareness skills were compared, it

was found that middle school students have lowest awareness skills in morphological awareness.

In summary, although Turkish has rich morphemes, morphological awareness is a new interest for Turkish reading literature. When morphological awareness is studied about, it paves the way for understanding reading development in Turkish not only for normal developing readers but also poor readers.

This chapter presents the theories underlying reading development with studies about cognitive and linguistic variables. Also, Turkish studies are put in different aspects because of the phonological and morphological properties. The next chapter introduces the methodology of this study.

Research Questions

The following research questions were developed to investigate whether or not cognitive and linguistic variables which differentiate poor and good readers in Turkish second graders.

1. What are the relationships among ORF, PA, RAN, PM and MA skills in poor and good readers in the second grade?

2. How much additional variance in oral reading fluency is explained by rapid naming and then morphological awareness after controlling phonological awareness in poor and good readers? Which of these variables is the best predictor of reading for the two groups?

CHAPTER 3

METHODOLOGY

The purpose of the current study is to explore the relationships between cognitive
and linguistic variables in poor and good readers in the second grade. This chapter
includes research design, participants, instruments, procedure and data analysis. In
the first part, the design of the study, research questions and hypotheses are
presented. In the second part, information about the participants is given in detail. In
the third part, data collection procedures are explained. The fourth part includes
descriptions of the instruments used in data collection. In the last one, the analysis of
data is presented.

3.1 Design

This study aimed to investigate the relationships among cognitive and linguistic
abilities in poor and good readers in the second grade. It is a correlational design in
quantitative approach in order to find out the relationships among these variables,
since correlational designs are based on the nature of relationship without causality
(Black, 2003). The instruments of cognitive and linguistic skills were used and
statistical analyses were carried out in order to examine the relationships between
these abilities. The variables of this study are oral reading fluency (ORF),
phonological awareness (PA), rapid automatized naming (RAN), phonological
memory (PM) and morphological awareness (MA). Since this study focuses on the
role of these variables in differentiating poor and good readers, it is attempted to
address the following questions:

1. What are the relationships among ORF, PA, RAN, PM and MA skills in poor and good readers in the second grade?

2. How much additional variance in oral reading fluency is explained by rapid naming and then morphological awareness after controlling phonological awareness in poor and good readers? Which of these variables is the best predictor of reading for the two groups?

Based on the research questions of this research, the following assumptions are hypothesized.

1. There will be different correlations between oral reading fluency and cognitive/ linguistic variables in poor and good readers. In poor readers, reading will have significant correlations with PA and RAN like in the literature. In good readers, PA, RAN and MA will have significant relations to reading.

2. PA, RAN and MA will be significantly explained with high variance of oral reading fluency in both poor and good readers. Also, weakness in PA and RAN impact the ability to read fluently in poor readers. Furthermore, MA will be the highest contributor to good readers in the line with reading development theories.

3.2 Participants

The sample of the study was 66 students in the second grade in İstanbul. In the Turkish Education System, one of educational attainments of Turkish reading and writing lessons in the first grade is "to read fluently syllables, words and sentences" (MEB, 2015, p. 16). Thus, it is expected that children can read at the end of the first grade. As expected, first graders read slowly because of the process of reading

acquisition (Erden, Kurdoğlu, & Uslu, 2002). Also, some children can learn to read and write in Turkish slowly with various reasons and therefore reading acquisition may take a longer time. To this end, this study selects students in the second grade because it is expected that the acquisition of reading fluency is completed in the second grade. If students cannot read fluently in the second term of the second grade, they may be considered to be poor readers or may demonstrate some reading difficulties.

To reach the participants, this study used a two- stage sampling. Firstly, the primary schools were determined via convenience sampling. Convenient primary school principals signed the consent form which allows the research in their schools (App. A). Secondly, a purposeful sampling was used in order to reach poor readers in the classrooms. The teachers were asked to determine the poor readers in their classrooms. Also, the children with the diagnosis of mental retardation and who were not able to speak clearly and fluently were excluded from this study. Thus, until a certain number of poor readers were found, the researcher contacted many schools and teachers. On the other hand, grade-appropriate or good readers were found easily. After the students to be involved to determine, the consent forms were also sent to parents (App. B). Consents of the children to participate the study voluntarily were also taken verbally.

Finally, the data was gathered in eight public schools in Şişli and Beşiktaş in İstanbul. 17 classroom teachers and 66 students participated in this study. The classroom teachers filled the demographic information form about the students (App.C). They were asked to assess the children's reading abilities.

As stated before, the poor and good readers had been determined by teachers' evaluations (having reading difficulties or not). Although the teachers classified

some children (two children) into the group of reading difficulty, the students performed above the mean of oral reading fluency task and read fluently. Also, some children (ten children) who the teacher thinks do not have any reading difficulties performed below the mean of oral reading fluency. Thus, the teacher evaluation was not taken to be the absolute criterion for deciding a child as poor or good reader. Instead of teacher judgments, the mean value of the students in oral reading fluency task was used as a cut-off point to divide poor and good readers.

The oral reading fluency test was used for determining the reading achievement of children. The test measures the number of correct words while reading orally in one minute. The sample mean in oral reading fluency is 61,12 (SD=35,38). The mean of the sample was seen acceptable for dividing the sample into poor and good readers in the second grade. Thus, reading below the mean of the sample (below 61 words in one minute) was considered as poor reading in this study. Similarly, if a child reads correctly above 61 words in one minute, s(he) was considered as a grade-appropriate reader or good reader.

This cut-off point for poor readers or good readers in the second grade was seen reasonable because Güneş (2000) stated reading 60 words in one minute is expected from a first grade student at the end of the academic year. The sample of the current study comes from second grade and they participated in this study at the end of the second grade. Therefore, reading performance of the children who read below 61 words in one minute at the second term of the second grade was regarded as the first grade level according to Güneş (2000). Moreover, there were there students who diagnosed with specific learning disorders in the sample. All of three had below 61 words in one minute and they were placed in the group of poor readers.

In addition, the reading performance of the poor and good readers in this study will be discussed more in discussion chapter with the results of previous studies.

After dividing the sample into two groups, multivariate outliers were checked. One child was excluded from data set because s(he) was multivariate outlier according to the result of analysis in Mahalanobis distance. Therefore, the study was completed with 33 poor readers and 32 good readers, a total of 65 participants.

The characteristics of the poor and good readers revealed by the data collection process are presented below. As seen in Table 1, the poor readers (n=33) read between 0- 60 words in one minute. This group consists of 51% of the sample. On the other hand, the good readers (n=32) reads between 64- 117 words in a minute. The means of oral reading fluency remarkably differ among the two groups. Although the poor readers read only 32 words in one minute, the good readers read approximately 93 words on average. Overall, it could be clearly seen that the good readers read more words in one minute than the poor readers.

Table 1. Reading Levels of the Participants according to Oral Reading Fluency

Reading Level	N	Percentage (%)	Number of Words Read per minute - 142 words (ORF)	Mean	SD
Poor Readers	33	50.8	0-60	32.30	18.87
Good Readers	32	49.2	64-117	92.75	14.83

The sample demographic characteristics are indicated in Table 2. Firstly, the gender composition of the groups is different from each other. 64% (n=21) of the poor readers is boys but the percentage of boys in the good readers is 41% (n=13). That is, the good readers consisted mostly of girls while more than half of the poor readers consisted of boys.

Table 2. Demographic Characteristics of the Poor and Good Readers

Characteristics	Poor Readers (n=33)		Good Readers (n=32)	
	N	%	N	%
Gender				
Girls	12	36	19	59
Boys	21	64	13	41
Age				
83-92 months	13	39	13	41
93-100	16	49	19	59
Missing	4	12	0	0
Preschool Education				
Yes	17	52	31	97
No	7	21	1	3
Missing	9	27	0	0

Also, the age of all participants vary from 83 months to 100 months. That is, the children's ages range from 6 years and 11 months to 8 years and 4 months. Despite almost one-year age difference within the sample, the ages of the poor and good readers are close to each other. While 39% (n=13) of children in the poor readers are between 83-92 months, 41% (n=13) of the good readers are between these months. However, 49% (n=16) of the poor readers are between in 93-100 months whereas 59% (n=19) of the good readers are between these months.

However, the poor and good readers differ in having preschool education. Whereas only 52% (n=17) of the poor readers have preschool education, 97% of the good readers have it. There is also some missing data only in the poor readers. The result demonstrates that the good readers have an advantage on having preschool education than the poor readers.

According to the information taken from teachers, the educational levels of the parents are categorized in Table 3. As seen, the mothers of the good readers have generally a higher level of education than the mothers of poor readers. Specifically, the percentage of the mothers on having high school and undergraduate degree is higher in the good readers (85%, n=27) than in the poor readers (43%, n=14).

Furthermore, the fathers' educational background in the two groups is similar to the level of education of the mothers. In the poor readers, the percentage of the fathers who have high school education and over is 40% (n=13), but the same educational level of the fathers in the good readers is 82% (n=26). All in all, it can be clearly said that the parents of the good readers have a higher educational level than that of the poor readers.

Table 3. Educational Backgrounds of the Parents of the Poor and Good Readers

Educational Backgrounds	Poor Readers (n=33)				Good Readers (n=32)			
	Mothers		Fathers		Mothers		Fathers	
	N	%	N	%	N	%	N	%
Illiterate	3	9	1	3	1	3	0	0
Literate	4	12	4	12	1	3	2	6
Primary School	6	18	5	15	2	6	2	6
Secondary School	2	6	6	18	1	3	2	6
High School	9	28	9	28	15	47	13	41
Undergraduate	5	15	4	12	12	38	13	41
Missing Data	4	12	4	12	0	0	0	0

In order to see any difference on reading acquisition between poor and good readers, the time when students have learned to read is asked to the teachers. According to the teachers' evaluations, reading acquisition time also differ in the two groups. Whereas most children in the group of the good readers (88%, n=28) learned reading in the first semester of the first grade, only four children (12%) in the poor readers learned it in that period. As seen, 31% of (n=10) the poor readers acquired reading in the second semester of the first grade and 27% (n=9) of them learned reading in the second grade. Unfortunately, the teachers stated that 15% (n=5) of the poor readers have still not learned to read at the end of the second grade. Thus, it can be saliently seen that the good readers learn to read faster than poor readers. Also, the

poor readers have a trouble in acquisition of reading and they experience reading

problems even in the first semester in the first grade.

Table 4. Time of Reading Acquisition (Teachers' evaluation)

Time of Reading Acquisition	Poor Readers (n=33)		Good Readers (n=32)	
	N	%	N	%
1st grade				
1st semester	4	12	28	88
2nd semester	10	31	1	3
2nd grade				
1st semester	6	18	1	3
2nd semester	3	9	0	0
Still Not Reading	5	15	0	0
Missing Data	5	15	2	6

Another evaluation of the teachers is the academic performance of the

students on Turkish and Mathematics courses. Table 5 indicates that 70% (n=23) of

the poor readers have low performance on Turkish course and 67% of them also have

inadequate performance on Mathematics. On the contrary, the good readers have an

advanced performance on Turkish (84%, n=27) and on Mathematics (66%, n=21).

As a result, it is clearly seen that the two groups differ in their performance on the

courses. The good readers are more successful than the poor readers on Turkish and

Mathematics.

Table 5. Academic Performance of Reading Groups (Teachers' Evaluations)

	Poor Readers (n=33)				Good Readers (n=32)			
	Turkish		Math		Turkish		Math	
	N	%	n	%	N	%	N	%
Unsatisfactory	23	70	22	67	1	3	1	3
Satisfactory	9	27	8	24	4	13	10	31
Advanced	1	3	3	9	27	84	21	66

3.3 Data collection procedures

The study started after the permission of Boğaziçi University Research Ethics

Committee in April 2015 (App. C). All of the tests were administered in the second

semester of the 2014 - 2015 academic year. The order of the tests was changed for

each participant to avoid the effects of mental and physical fatigue on the

participants' performance. The administration of all tests took about an hour. The

instruments were conducted individually and generally all tests at once. When some

students showed signs of fatigue, the tests were given to these children in two

sessions. However, since most children liked the tests and said they had fun time

during the testing session, the tests were mostly given in one session.

3.4 Data collection instruments

To measure cognitive and linguistic skills, the instruments of oral reading fluency,

phonological awareness, rapid naming, phonological memory and morphological

awareness were conducted. The tests of phonological awareness, rapid naming and

phonological memory are reliable and valid in Turkish. However, Turkish

morphological awareness tests were developed for this study by the researcher, so the

pilot study was done for morphological awareness tasks. Also, a demographic

information form was used for data collection about the subjects. Table 6 showed the

measurements and sub- measurements which were used in this study.

Table 6. Measurements and Sub-measurements of the Study

Measurements of the Study
1. Oral Reading Fluency

2. Phonological Awareness
    a. Elision
    b. Segmentation
    c. Blending

3. RAN
    a. Numbers
    b. Letters

4. Short Term Memory
    a. Forward Digit Span
    b. Backward Digit Span

5. Morphological Awareness
    a. Derivational Morphological Awareness
    b. Inflectional Morphological Awareness

3.4.1   Demographic information form

This form consists of questions about the students who participate in the study. It is filled by the classroom teachers of the participants. The form includes two parts. The first part covers the name of the participant, birth date, gender, and the name of the school, preschool education, health problem, hearing and language problems, hand choice, reading and writing difficulties. Parents' education level and occupations are also involved in order to determine the socio-economic level of the participants. The second part of the form is about the academic performance of the participants, so the teachers evaluate their students' academic performance on Turkish and Mathematics and they also state the latest mark of the Turkish lesson and the time of reading acquisition of the students.

3.4.2   Oral reading fluency test

The Oral Reading Fluency test measures the ability of oral reading speed which is based on the numbers of words read correctly in one minute.

The test used in this study is based on the previous research conducted by Bakır & Babür (2009); Babür and Abolafya (in preparation) and Babür, Haznedar, Erçetin, Özerman, & Erdat-Çekerek (2013). They used a reading passage, which was written by a professor who also writes children story books. Babür and her colleagues (2013) rearranged the passage based on the feedbacks of twenty classroom teachers. They also arranged the numbers of words in each sentence and the font size according to the second grade level. This study used the latest version of the passage. (App.D)

The reading passage includes a total of 142 words. The students are asked to read the passage orally. The total score is the numbers of words that is read correctly in one minute.

3.4.3   Phonological awareness tasks

This study used the Turkish version of Comprehensive Test of Phonological Processing ([CTOPP], (Wagner, Torgesen, & Rashotte, 1999). The Turkish version of CTOPP, which was called Kapsamlı Fonolojik Farkındalık Testleri [KFFT], was adapted by (Babür, et al. 2013). Elision, segmentation and blending tasks in KFFT were used in the study in order to measure phonological awareness. Phonological awareness tasks are generally used to measure the ability of knowledge of phoneme and grapheme with subtests. The total score of subtests is computed by the total numbers of correct items in a subtest. The test items are gradually getting harder. The test is stopped after three subsequent errors.

3.4.3.1 Elision (Deletion)

The elision task is to measure the ability of extracting some part of the word in the mind. It includes three training items and 20 test items. The examiner says a word and the examinee repeats the word. Then, the examiner asks to delete a sound or syllable of the word from the examinee and to say again the new word. For example, the examiner says "okul" (school) and asks to say the remaining part of the word after deleting to the sound of "l". If the examinee knows the correct answer, which is "oku", he or she gets 1 point.

3.4.3.2 Segmentation

Segmentation task is to measure the ability of articulating the sounds of words in order. It includes five training items and 20 test items. The examiner says a word and examinee repeats the word. Then, the examiner asks to segment the word into phonemes. To illustrate, the examiner says "üç"(three) and asks to say the sounds of the word in order. If the examiner says the sound of "ü" and "ç", they get 1 point.

3.4.3.3 Blending

Blending task is to measure the ability of forming a word by linking sounds or syllables. It includes six training items and 20 test items. When the examiner says syllables or sounds, the examinee keeps them in the mind and forms a word with them. For example, the word is "bal". The examiner says the sounds of /b/-/a/-/l/ in order and the examinee is asked to combine the sounds and say "bal".

3.4.3.4 The reliability of the PA tasks

When analyzing the reliability of phonological awareness in the current study, it was found that the three subtests of PA have a strong reliability in Table 7. Specifically, the values of Cronbach Alpha were .97 for elision, .94 for segmentation and .88 for blending. The reliability of total phonological awareness was found as. 97.

Table 7. Reliability of PA Tasks

Measures	Cronbach Alpha (α)
Elision	.97
Segmentation	.94
Blending	.88
Phonological Awareness (Total)	.97

3.4.4   Rapid automatized naming (RAN)

The Rapid Automatized Naming (RAN) test is originally designed by Denckla (1972) and later developed by Denckla and Rudel (1976a, 1976b). RAN measures a person's ability to perceive a visual symbol and retrieve the name for it accurately and rapidly, which is referred to as naming speed. That is, it measures time for naming all items in random order as quickly as possible with exact accuracy. Lower scores of time mean better performance of children. It has originally four subtests: objects, colors, numbers, and letters. There are five items in each subtest, repeated ten times so that the total stimuli of each subtest are fifty.

RAN is adapted to Turkish by Bakır & Babür (2009) and was standardized to assess validity and reliability of the test. The test-retest reliability coefficients of the Turkish RAN ranged from .85 to .95. This shows that the Turkish RAN is consistent to the original RAN which had coefficients from .81 and .98 (Wolf & Denckla, 2005).

The Turkish RAN has four subtests as the original RAN, but the study uses only the subtests of number and letters. The Turkish RAN Numbers subtest consists of five numbers (2, 4, 6, 7, 9) appearing twice per row. The Turkish RAN Letters subtest consists of five high frequency lowercase letters (k, s, m, b, t) appearing twice per row.

3.4.5 Phonological memory

The short term memory is measured with WISC-R digit span tasks. It measures the ability of remembering and repeating a series of numbers. It has two subtests: the forward digit span and the backward digit span. The total score of short term memory is counted with these subtests. The tasks are applied individually in approximately 10 minutes.

3.4.5.1 Forward digit span

The digit recall task includes eight items which each has two trials. The task measures the ability to remember and repeat series of numbers ranging from two to nine digits. After hearing the number series, the child is immediately asked to repeat them in the same order. To illustrate, if the trial is "5-6-3", he or she should repeat "5-6-3". If the child is successful in both trials in one item, 2 points are given; if the child answers correctly in only one trial in a row, 1 point is given. The test is ended when the child has two errors in one item and is given zero point. The total score is counted with each true recall. The maximum point is 16 since one item has two trials.

3.4.5.2 Backward digit span

The backward digit recall task has seven items in which each item includes two trials as in the digit span forward task. Unlike the digit span forward test, the test measures the ability to remember the numbers and repeat them backwards in an order. For example, if the researcher says "5-6-3", the subject should say "3-6-5". Also, the two trials in one item must be true for two points, if one of two trials is true, one point is given; and if the two trials are false, the test is stopped. The maximum point is 14.

3.4.6 Morphological awareness tests

The morphological awareness test is to assess the understanding of the smallest unit of meaning, a suffix. It includes derivational and inflectional morphological awareness subtests. These tests were developed in 2015 by Kuzucu Örge, the researcher of the current study, with the inspiration from the study of Babayiğit and Stainthorp (2010) and the study of Singson, Mahony, & Mann (2000).

Singson, Mahony, & Mann (2000) measured derivational morphological awareness via manipulating a suffix in the real words and non-words. They used derived words from two choices within the sentences (e.g. electric, electricity). In addition to derivational suffixes, words and non-word versions for inflectional suffixes were created for this study. Thus, there were four subtests that were developed for this study: nonword and real word inflectional awareness, and non-word and real word derivational suffix. Each of the subtests had five sentences. An example sentence in real word inflectional awareness is below.

Öğretmenler gününde ….. ….. (öğretmenime, öğretmenimin) çiçek aldık.

We bought flowers……. (for my teacher, my teacher's) on Teacher's Day.

Therefore, a pilot study was conducted by the researcher. Written sentences and fill-in-the blank from choices question forms were used. Because poor readers had difficulties in reading; they focused on reading, but not the morphological structure. Then, another pilot study was done giving the sentences orally. In that pilot study, the poor readers seemed more comfortable and focused on the structure of words and sentences. Therefore, morphological tests in this study should be given orally because of avoiding effects of reading.

However, there were some problems in the types of the questions and of the words in the pilot study. Some children had not kept in mind target non-words and sentences. Also, some children focused on nonsense words and said that they did not know the meaning of the words and did not answer the questions. Therefore, using sentences with fill-in-the blank were changed due to difficulties in remembering many things. Also, using non-words and real words were handled again to avoid measuring vocabulary skills.

In the study of Babayiğit and Stainthorp (2010), there is a test for inflectional awareness in Turkish. In that test, children are asked grammatical judgments of spoken sentences with pseudo nouns. Firstly, similar to the test, a non-sense word test of inflectional morphological awareness was created with true/ false questions and used for the pilot study with the consent of these researchers. When children were not familiar the word, they were so confused about adding a suffix to the word and choosing the correct form of the suffix. Thus, an inflectional test was developed for this study with only real words in the form of true/ false questions.

On the other hand, non-words were used in this study for measuring derivational morphological awareness because of the Turkish morphological structure. In Turkish, when adding a derivational suffix to a word, a new word with a

new meaning is created. If a word is used in derivational morphological awareness, it may measure vocabulary skills. To illustrate, when the child is asked "Who sells books (kitap)?", if the child knows "bookseller", she says "bookseller"(kitapçı). If not, she may avoid answering the question. In this question, measuring vocabulary skills and derivational morphological awareness can be mixed. However, when the child is asked "Who sells pitak?" (nonsense but phonologically similar to "kitap", book in English), if the child knows the meaning of the suffix "çı", she may know the answer. In this question, via using non-sense words, only derivational morphological awareness is measured.

In sum, this study uses different types of questions in measuring derivational and inflectional morphological awareness in order to avoid measuring vocabulary and verbal short term memory skills. Thus, the derivational morphological awareness tasks include nonsense words with multiple choice questions but the inflectional suffix tasks uses real words with true/ false questions in order to measure morphological awareness.

3.4.6.1 Derivational morphological awareness test

The derivational suffix is used to derive a new word with a new meaning. That is, if a suffix gives a new meaning to the word, the suffix is a derivational suffix in Turkish. The test was inspired from study of Singson, Mahony, & Mann (2000) and developed by Kuzucu Örge in 2015. The derivational morphological awareness test is to measure the understanding the meaning of derivational suffixes with a nonsense word. Thus, in order to measure the derivational suffix awareness, the derivational suffixes which are added to the nonsense words (noun/verbs) were chosen from the

study of Karadağ and Kurudayıoğlu (2010) which shows frequently used derivational suffixes in each grade.

The test has 10 items and it is a multiple choice task (App. E). After the sentences are read to the child with two choices, the child is asked to choose the more sensible one with the suffixes. Three nonword items can resemble a word in Turkish because they are phonologically similar. Other items can be made with the meaning of sentences and of suffixes.

For example, the sentence is :

"If a person sells "pitak", who is this?" (Pitak satan kişiye ne denir?)

a) pitakçı   b) pitaksız

"Pitak" is nonsense word in Turkish but it seems like "kitap" (book) in Turkish. The suffix "çı" in Turkish makes sense of a person who generally does a job or does an activity. The suffix "sız" means of something. Therefore, the answer should be "pitakçı" meaning "pitak" seller like "kitapçı" that is book seller.

3.4.6.2 Inflectional morphological awareness test

Inflectional morphological awareness test is to measure grammatical judgments for spoken sentences, so the child is asked to decide whether the sentence is meaningful or not. Inflectional suffixes give the meaning of pronouns and tenses in Turkish. That is, it does not make a new word and only shows the persons and time. The test was inspired from earlier work of Babayiğit and Stainthorp (2010) and created by the researcher, Kuzucu Örge in 2015. It is a completely new inflectional awareness test, only making use of the type of questions similar to the study of Babayiğit and Stainthorp (2010).

The test has two subtests: nominal inflectional suffixes and verbal inflectional suffixes. Nominal inflectional suffixes are possessive pronouns, singular and plural suffixes, comparative suffixes, nouns with dative, accusative, locative and ablative. Verbal inflectional suffixes are possessive pronouns and tense suffixes. Therefore, there are 16 items with nominal inflectional suffixes and ten items with verbal inflectional suffixes (App. F). That is, sixteen sentences consisted of eight sentences which have correct and inaccurate forms of nouns with inflectional suffixes, and ten items which are five sentences with correct and inaccurate forms of verbs with inflectional suffixes. As an example for noun inflectional morphological awareness:

Kuşun kanatları var. (T) The bird has wings.

*Kuşu kanatları var. (F) To bird has wings.

3.4.6.3 Reliability analysis of the morphological awareness tests

The morphological awareness tests were created by Kuzucu Örge for this study and they were checked for reliability of subtests in Table 8. They turned out to be reliable according to Cronbach alpha values. Morphological awareness in total had very strong reliability (α=.88). The values of Cronbach Alpha were .61 in derivational awareness and .87 in inflectional awareness.

Table 8. Reliability for Morphological Awareness

Measures	N of items	Cronbach Alpha (α)
Derivational Morphological Awareness	10	.61
Inflectional Morphological Awareness (Total)	26	.87
Inflectional Morphology (Noun)	16	.84
Inflectional Morphology (Verb)	10	.67
Morphological Awareness (Total)	36	.88

3.5 Data analysis

The data was analyzed through the SPSS 20. The results included descriptive statistics with correlations and regressions for the poor readers and good readers separately. Firstly, descriptive statistics showed means and standard deviations for the two groups. Secondly, the correlations between cognitive and linguistic skills with reading were found for each group. Lastly, the hierarchical multiple regression analyses were done in order to see how much variance in reading fluency is explained by rapid naming and morphological awareness after controlling phonological awareness in the poor and good readers.

CHAPTER 4

RESULTS

This chapter presents the results of quantitative analyses on the basis of data collected from the poor and good readers in the second grade. It consists of the descriptive analyses of the measures and the answers for the research questions. To answer the research questions, correlational analysis and multiple hierarchical regressions were conducted for the poor and good readers. The findings were given in the two basic research questions.

4.1 Descriptive analyses of the measures

This study used oral reading fluency, phonological awareness, rapid automatized naming, phonological memory and morphological awareness as variables. The composite scores of variables were found before data analysis. Firstly, oral reading fluency (ORF) measures the numbers of words which children read correctly in one minute. Except ORF, the composite scores were computed for all variables. Secondly, the composite phonological awareness (PA) score was calculated with the addition of subtests of PA: elision, segmentation and blending scores. Thirdly, rapid automatized naming (RAN) score was found by taking the total seconds of naming numbers and letters. In addition, phonological memory (PM) score was gained by combining the forward and backward digit span. Lastly, morphological awareness (MA) score was attained by merging the derivational and inflectional morphological awareness scores.

After the composite score calculations, data was split into poor and good readers as mentioned previously in the methodology chapter. Then, the means,

standard deviations, minimum and maximum scores were found separately in each group. In addition to the composite scores, the performance of the poor and good readers on subtests in PA, RAN, PM and MA were indicated.

Then, the assumptions of correlations and regression were checked. In the collinearity statistics, the variance inflection factor levels were found smaller than 10 and the tolerance levels were greater than .10. Also, multivariate outliers were checked and there was one outlier in the poor readers and he/she was excluded from all data analysis.

After checking outliers, the descriptive analyses of the poor and good readers were presented in Table 9. It can be seen that there were apparently differences between the poor and good readers on the means of all variables. The good readers had higher points in the means of all measurements than poor readers. The substantial difference between the poor and good readers was in the oral reading fluency test. The good readers read approximately 93 words in one minute (SD=14,83), but the poor readers read only 32 words (SD=18,87). In addition to reading, the good readers had superiority on PA means. The mean of phonological awareness was 45,03 (SD=8,07) in the good readers while it was 20,00 (SD=12,91) in the poor readers out of the maximum score 60. Looking at the subtests of PA, the means of elision, segmentation and blending were approximately 5, 6 and 7 points in the poor readers while they were 17, 14 and 12 points in the good readers out of 20, the maximum score. Moreover, it was also seen that some children received zero point in elision and segmentation subtests in the poor readers and there was no child who obtained the maximum score in the subtests of phonological awareness in the group.

Table 9. Descriptive Statistics for the Poor and Good Readers

Tests	Poor Readers (n=33)			Good Readers (n=32)		
	M	SD	Range	M	SD	Range
Oral Reading Fluency	32.30	18.87	0 - 60	92.75	14.83	64 - 117
PA (Composite)	20.00	12.91	2 - 43	45.03	8.07	16 - 54
Elision	5.97	6.19	0 - 18	17.78	3.89	2 - 20
Segmentation	6.21	5.05	0 - 16	14.91	3.35	9 - 20
Blending	7.82	4.00	2 - 19	12.34	3.45	5 - 18
RAN (Composite)	76.70	20.27	49 - 131	60.41	8.07	41 - 78
Numbers	37,67	8.81	24 - 62	31.69	4.66	21 - 47
Letters	39.03	13.10	24 - 78	28.72	5.06	20 - 41
PM (Composite)	8.58	2.18	5 - 12	12.28	2.73	7 - 21
Forward Digit Span	6.00	1.56	3 - 9	7.97	1.93	4 - 13
Backward Digit Span	2.58	1.25	0 - 5	4.31	1.15	2 - 8
MA (Composite)	23.82	6.09	15 - 35	31.22	4.27	19 - 36
Derivational Morphology	6.39	1.90	2 - 10	8.06	1.83	4 - 10
Inflectional Morphology	17.42	4.94	8 - 26	23.16	3.01	13 - 26

Similarly, the obvious difference between groups was also seen in the means and standard deviations in RAN. Whereas the good readers had the mean of 60,41 seconds (SD= 8,07) in rapid naming, the poor readers got the mean of 76,70 (SD=20,27). As stated, the lower score in RAN shows a better performance of naming speed. Moreover, the poor readers obtained lower points ($\bar{X}$=8,58, SD=2,18) than the good readers ($\bar{X}$=12,28, SD=2,73) in phonological memory. The last difference in Table 9 was that the poor readers had the mean of 23,82 (SD=6,09) in morphological awareness whereas the good readers got a high mean of 31,22 (SD=4,27) out of 36, the maximum score. When all variables are taken into consideration, the poor readers had lower points than the good readers in these measurements.

4.2 Presentation of research findings

Research Question 1: What are the relationships among ORF, PA, RAN, PM and MA skills in poor and good readers in the second grade?

The first question examines the relationships among all measures for poor and good readers in order to see whether or not there is any change in measures' relations between groups. To answer the question, Pearson-moment correlation analyses were conducted. Correlations of variables by the poor and good readers were presented in Table 10 and correlations of subtests for two groups were shown in Table 11. These results were presented in this sequence in order to answer the first question.

In the poor readers, correlation matrix of five composite variables (Table 10) revealed that reading had significant correlations with PA, RAN and MA. Reading and phonological awareness had a significant strong correlation in the poor readers ($r=.605$, $p<.01$). Also, there was a negatively significant relationship between reading and RAN ($r=-.549$, $p<.01$). As seen, reading and morphological awareness was significantly related ($r=.412$, $p<.05$). However, reading did not have significant relationship with phonological memory. Moreover, all measurements were significantly related to each other although phonological memory did not have any significant correlation with any measurements.

Table 10. Intercorrelations among the Measures in the Poor and Good Readers ***

Measures	1	2	3	4	5
1. ORF		.471**	-.204	.203	.631**
2. PA	.605**		-.026	.463**	.659**
3. RAN	-.549**	-.430*		.003	.000
4. PM	.233	.443**	-.093		.418*
5. MA	.412*	.500**	-.404*	.401*	

Note. * p < .05, ** p < .01, ***Good readers above diagonal and poor readers below diagonal.

On the other hand, Table 10 also showed relationships of measurements in the good readers. As seen, it was found that oral reading fluency had significant correlations with PA and MA in the good readers. Reading and PA had a significant moderate correlation (r=.471, p<.01) while reading had a strong correlation with MA (r=.631, p<.01). However, reading was not related to RAN and PM in the good readers.

In comparison with these correlations, it can be said that reading was related to phonological awareness and morphological awareness in both the poor readers and the good readers with different correlation co-efficients. Whereas the correlation co-efficient between reading and PA by the poor readers was .605 (p<.01), it was found .471 (p<.01) in the good readers. Similar to PA, MA was moderately correlated with reading in the poor readers (r=.412, p<.05), while it had a strong correlation with reading in the good readers (r=.631, p<.01). In other words, regardless of their reading level, the more a child has phonological and morphological awareness, the more words he/she has read. Unlike the good readers, RAN and reading had a negative moderate correlation in the poor readers (r=-.549, p<.01). That means, a poor reader names a number or a letter slowly, and he/she reads fewer words. Lastly,

phonological memory had not any relationship with reading fluency in neither the poor readers nor the good readers.

To clarify the relationships among composite scores, relationships between subtests were examined for the poor and good readers and presented in Table 11. Firstly, reading fluency and subtests of the instruments were analyzed for the poor readers. It was found that reading fluency had significant relationships with PA subtests, RAN subtests, and inflectional morphological awareness. There were significant and moderate correlations with elision (r=.586, p<.01) and segmentation (r=.567, p<.01) in PA. In addition, reading had significant and negative correlations with numbers (r=-.446, p<.01) and letters (r=-.549, p<.01) in RAN. Similar to the composite score of phonological memory, the forward and backward digit span did not have significant corrections with reading. Furthermore, although derivational morphology did not have any significant relationships with reading fluency, inflectional morphology had significant but weak relationship with reading in the poor readers' group (r=.393, p<.05).

Table 11. Intercorrelations among the Subtests of Measurements in the Poor and Good Readers

Variables	1	2	3	4	5	6	7	8	9	10
1. ORF		.457**	.376*	.221	-.115	-.220	.153	.225	.559**	.555**
2. PA (Elision)	.586**		.379*	.436*	-.088	-.048	.287	.319	.595**	.643**
3. PA (Segmentation)	.567**	.715**		.226	.180	-.035	.459**	.259	.306	.437*
4. PA (Blending)	.328	.354*	.610**		-.071	-.188	.278	.200	.308	.262
5. RAN (Numbers)	-.446**	-.272	-.282	-.253		.380*	.071	-.174	.078	-.022
6. RAN (Letters)	-.549**	-.331	-.443**	-.385*	.699**		.045	-.012	-.099	.037
7. PM (Forward Digit Span)	.160	.272	.361*	.200	.048	-.066		.544**	.275	.330
8. PM (Backward Digit Span)	.207	.378*	.317	.165	-.186	-.083	.192		.221	.443*
9. MA (Derivational)	.297	.330	.287	.047	-.305	-.414*	.273	.401*		.532**
10. MA (Inflectional)	.393*	.531*	.528**	.145	-.190	-.404*	.287	.217	.480**	

Note. * p<.05, ** p <.01, ***Good readers above diagonal and poor readers below diagonal.

ORF= Oral Reading Fluency, PA=Phonological Awareness, RAN= Rapid Automatized Naming, PM= Phonological Memory, MA= Morphological Awareness.

The correlations among the subtests in the good readers were also presented in Table 11. It was found that reading had significant relationships between subtests of PA and MA like the total scores in the good readers. Specifically, reading fluency was correlated with elision (r=.457, p<.01) and segmentation (r=.376, p<.05) in phonological awareness. In addition, it had a significant correlation with derivational (r=.559, p<.01) and inflectional morphology (r=.555, p<.01) in MA. In consistency to the total of measurements in the good readers, the subtests of RAN and PM did not have correlations with reading.

To summarize, Table 10 shows the correlations of the measurements in total by the poor and good readers and Table 11 presents the details of these correlations. It was found that reading was related to the subtests of elision and segmentation in PA and to the subtest of inflectional morphology in MA. These three subtests were associated with reading fluency in both the poor and good readers. To compare the results between the two groups, the subtests of MA had the highest correlation co-efficient with reading in the good readers, while the subtests of PA and RAN were associated with reading in close coefficients in the poor readers. However, in both groups, reading did not have any relations with phonological memory and its subtests. Consequently, these findings are important to explain different relationships of reading with cognitive and linguistic skills in terms of poor and good readers. The next question will provide a more detailed explanation to the relationships of these skills to reading.

Research Question 2: How much additional variance in oral reading fluency is explained by rapid naming and then morphological awareness after controlling phonological awareness in poor and good readers? Which of these variables are the best predictors of reading for the two groups?

To answer this question, hierarchical multiple regressions analyses were conducted. As it was found that oral reading fluency was not significantly related to phonological memory (PM) in both groups, PM was not added to the regression model. When assessing whether or not PA, RAN and MA account for variance on reading, these variables were put on the independent variables in an order. The variable which was controlled was put in Step 1 and there was only one variable in Step 2 to see only additional variance to regression and the third variable was on Step 3. The dependent variable was oral reading fluency.

Previous research indicated that PA and RAN were good predictors of reading fluency in poor and good readers. This study aimed to control the effects of PA, and then RAN on the prediction. Thus, PA was put in Step 1, RAN was placed in Step 2 and MA was added in Step 3 in the regression analysis for the poor and good readers. This procedure was traced to see how the variables contribute additionally to reading fluency. Also, the results of hierarchical multiple regression analyses for the poor and good readers were presented separately in different tables in order to see two groups' differences in explaining reading. In the tables, unstandardized (B), standard error of measurement (SEM), and standardized (β) regression coefficients, R^2 and change of R^2 (ΔR^2) were reported.

At first, the summary of hierarchical multiple regression analysis for the poor readers was showed in Table 12. It was found that PA explained 36.6% of the variance in oral reading fluency ($F_{1,31}=17.860$, p. <001). When RAN was added to

the model, 46.8% of variance in oral reading fluency was explained by PA and RAN.

That is, RAN contributed to variance of reading in an additional 10.2%

($F_{1,30}$=13.173, p. <001). Finally, when MA was added to the model, 47.0% of the

variance in oral reading fluency was explained ($F_{1,29}$ =8.578, p. <001). As can be

seen, MA did not have a significant contribution beyond others, although the model

still explained significantly to the high variance of oral reading fluency (47.0% of

variance). Moreover, phonological awareness was the best predictor of oral reading

fluency in poor readers in the model (β=.43).

Table 12. Summary of Hierarchical Multiple Regression for Oral Reading Fluency in the Poor Readers (n=33)

Variable	B	SEB	B	R^2	ΔR^2
Step 1				.37	.37**
PA	.88	.21	.60**		
Step 2				.47	.10**
PA	.66	.22	.45**		
RAN	-.33	.14	-.35**		
Step 3				.47	.00
PA	.62	.24	.43**		
RAN	-.32	.14	-.34**		
MA	.19	.50	.06		

Apart from the findings of the poor readers, the results of hierarchical

multiple regression analysis for the good readers were presented in Table 13. The

same procedures of the poor readers were followed for the analysis of the good

readers. It was found that PA explained oral reading fluency at 22.2% of variance

($F_{1,30}$=8.543, p. <001). When RAN was added to the model, 26% of variance in oral

reading fluency was explained. Although the model of combination with PA and

RAN explained significantly oral reading fluency, RAN did not have a significant

additional variance beyond PA in explaining reading. The additional 3.7% variance

did not make a significant contribution in the model, (F_{change} =1.435). However, when

MA was added to the model, it created a big difference. PA, RAN and MA in

combination made a significant explanation for oral reading fluency by accounting for 44.4% of variance ($F_{1,28}=7.441$, p. <001). MA had 18.5% of additional variance to total variance of reading fluency ($F_{change}=9.322$, p. <001). Lastly, it was found that morphological awareness was the best predictor of oral reading fluency in the good readers ($\beta = .57$).

Table 13. Summary of Hierarchical Multiple Regression for Oral Reading Fluency in the Good Readers (n=32)

Variable	B	SEB	B	R^2	ΔR^2
Step 1				.22	.22**
PA	.86	.30	.47**		
Step 2				.26	.04
PA	.86	.29	.47**		
RAN	-.35	.29	-.19		
Step 3				.44	.18**
PA	.16	.34	.09		
RAN	-.37	.26	-.20		
MA	1.97	.65	.57**		

Consequently, the hierarchical multiple regression analyses showed how much the cognitive and linguistic variables predicted reading for both the poor and good readers. According to the findings, oral reading fluency can be predicted at 47% by PA, RAN and MA in the poor readers. Similar to the poor readers, PA, RAN and MA explained oral reading fluency at 44% of variance in the good readers. In the poor readers, approximately 37% of variance in reading fluency came from PA; and RAN also explained 10% additional variance of reading fluency but MA did not have a significant contribution to oral reading fluency variance after controlling PA and RAN. In contrast, PA explained 22% of variance in reading, but RAN did not have a significant contribution to variance of reading fluency beyond PA in the good readers. Moreover, MA made a unique contribution at 18% variance in reading fluency after controlling PA and RAN in the good readers while it did not have a significant extra variance to reading fluency in the poor readers. Lastly, although

phonological awareness was the best predictor of oral reading fluency in the poor readers, morphological awareness was the best predictor of it in the good readers.

As a result, these analyses exhibited the relationships of cognitive and linguistic variables with oral reading fluency in the poor and good readers in the second grade. In the next section, the results of this study are discussed in relation to the previous literature in the field.

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter presents the interpretation of the results with earlier works about poor and good readers. In addition, it provides some implications for educators about reading development. In addition, the limitations of the current study are given and some suggestions are made for further research about reading acquisition in the end.

5.1   Discussion

5.1.1   Oral reading fluency performance of poor and good readers

The aim of this study was to investigate how poor and good readers differ from each other in cognitive and linguistic skills. As expected, the good readers had better performance in oral reading fluency because the groups of poor and good readers were formed according to the performance of students in oral reading fluency. As mentioned previously in the methodology section, if a child read more than 61 words in one minute, (s)he was considered as a good reader and; if a child read below 61 words, the child was placed in the group of poor readers.

In the current study, it was found that good readers read more words in one minute than poor readers in the second grade as shown in Figure 1. Although the poor readers read 32 words in one minute, good readers read 93 words. Reading performance of the two groups was found different from the earlier studies. Erden, Kurdoğlu, & Uslu (2002) and Gökçe-Sarıpınar & Erden (2010) found that the second grade students read 73 words in one minute. Thus, the poor readers read fewer words in one minute than the mean of the second graders. Still, the mean of the poor readers in oral reading fluency was lower than the mean of the first graders in the previous

studies (Erden, Kurdoğlu, & Uslu, 2002; Gökçe-Sarıpınar & Erden, 2010). First graders read 45 words in one minute in the study of Erden, Kurdoğlu, & Uslu (2002) and 48 words in the study of Gökçe-Sarıpınar & Erden (2010). In addition, the reading performance of the poor readers in the current study was close to reading performance of children with reading difficulties. Ergül (2012) found that children with reading diffiulties in the third grade read 44 words in one minute.
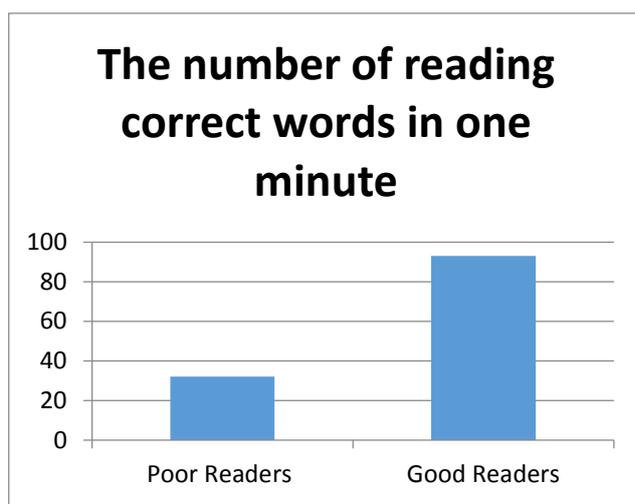

Fig.1 Oral reading performance of poor and good readers

Regarding the performance of good readers in the current study, the good readers in the present study read 93 words in one minute. Therefore, they read more words than the mean of the second graders in all earlier studies conducted with the second graders (Erden, Kurdoğlu, & Uslu, 2002; Gökçe-Sarıpınar & Erden, 2010; Güneş, 2000). In fact, the numbers of words in one minute for the good readers were close to the mean of the third graders in earlier studies. Erden et al. (2002) found the mean of the third graders on oral reading fluency was 91 and Gökçe – Sarıpınar and Erden (2010) found that it was 88 words in one minute.

In summary, it can be said that the poor readers in the current study have a similar performance on the reading task as first graders or children with reading difficulties while the good readers perform on it as third graders. For this reason, it

can be considered that the determination of the poor and good readers according to oral reading fluency is an acceptable division that was supported by Hasbrouck and Tindal (2006). After the evaluation of oral reading performance of the groups, the relationships between reading fluency and cognitive/linguistic skills will be discussed in the next section.

5.1.2   The relationship between PA, RAN, PM, MA and ORF

It was found in the current study that the relationships between oral reading fluency and cognitive/linguistic variables were different in the poor and good readers. While oral reading fluency was significantly related to PA, RAN and MA in the poor readers, it was a significantly correlated with PA and MA in the good readers.

Firstly, reading and phonological awareness were significantly related to each other not only in the poor readers but also in the good readers. In other words, if a child reads more words, he or she has more knowledge of phonology in both poor and good readers or vice versa. This result was consistent with previous studies about phonological awareness (Anthony & Francis, 2005; Gray & McCutchen, 2006; Juul, Poulsen & Elbro, 2014; McBride-Chang, et al., 2005; McBride-Chang, et al., 2012; Oakhill & Cain, 2012; Savage &Frederickson, 2005) and with the findings previously published in Turkish (Durgunoğlu & Öney, 1999; Güldenoğlu, Kargın & Ergül, 2016; Öney & Durgunoğlu, 1997). Moreover, the findings of the present study showed that elision and segmentation in phonological awareness are related to reading fluency in both poor and good readers while there is no relationship between blending and reading. As Schuele & Boudreau (2008) suggest, a child acquires it in this sequence: blending, segmentation and then elision. They proposed the most important acquisition is segmentation and it was found in the current study that the

subtests of means of segmentation and elision are very different between the poor and good readers. The poor readers have very low performance on these subtests although the good readers have high mean scores. Therefore, it can be said that segmentation and elision differ in the poor and good readers.

Secondly, RAN has a negative correlation with reading only in the poor readers. If the seconds in naming letters or numbers extend, oral reading fluency decreases. In other words, when a poor reader names a letter or number quickly, he or she reads more words. It can be argued that poor readers have difficulties in naming letters or numbers and they name them slowly. The finding is consistent with the assumption of Wolff (2014) that reading fluency is related to RAN in children with reading difficulties or disabilities. In addition, this current study found that separately and together letter and digit naming speed are related to reading fluency in the poor readers. The relationships were also supported by the results of some studies that reading fluency is related to digit naming (Savage & Frederickson, 2005) and letter naming (Katzir, et al., 2006) in poor readers. On the contrary, in the present study, RAN was not related to oral reading fluency in the good readers. This can be because good readers acquire automatization in reading, they name letters or numbers quickly and they do not engage in naming them while reading.

Thirdly, it was found that phonological memory has no relationship with oral reading fluency in either poor readers or good readers. In the previous works, some researchers demonstrated that there is no consensus about these relationships. There are some studies which found that phonological memory or verbal short term memory is related to reading (Babayiğit & Stainhorp, 2007; Brandenburg, et al., 2017; Muter & Snowling, 1998) and also to poor reading (Kesikçi & Amado, 2005; Carroll, Solity, & Shapiro, 2016; Tercan, Kesikçi & Amado, 2012). However, some

studies like the current study found that phonological memory is not related to reading fluency (Babayiğit, Stainthorp, 2011; Parrila, Kirby, & McQuarrie, 2004). Parilla and colleagues (2004) explained that phonological memory (phonological awareness and rapid naming) may share the predictive variance with other phonological processing tasks as the phonological processing model (Wagner & Torgesen, 1987) holds. In addition, in the current study, phonological awareness and phonological memory are significantly related to each other in the good and poor readers, but there is no relationship between phonological memory and rapid naming. Therefore, this may also be because phonological skills consist of phonological awareness and phonological memory apart from rapid naming as the double deficits hypothesis holds (Wolf & Bowers, 1999).

Lastly, similar to early research on morphological awareness (Kim, 2015), reading fluency was found significantly related to morphological awareness in the current study. Although reading fluency had a significant correlation with inflectional morphology in the poor readers, it was strongly related to derivational and inflectional morphology in the good readers. This result is supported by the study in derivational morphology (Duncan, Gray, Quemart, & Casalis, 2010) in that good readers have better performance in derivational morphology than poor readers. This may be because of the types of questions of the derivational and inflectional morphology in the current study. In the inflectional morphological awareness test, real words were used with the correct and incorrect forms of an inflectional suffix in a sentence. For this reason, they can be successful in the inflectional morphology because they could realize the unfamiliar form of an inflectional suffix in a spoken language. However, pseudo-nouns were used in measuring the derivational morphology. Thus, the poor readers could have difficulties in the derivational

morphology with nonsense words because they are not familiar the words. In order to answer the questions in the derivational morphology, they could have metalinguistic abilities of producing made up words with the derivations which may be related to vocabulary skills of children (Duncan, et al, 2010). Therefore, the question types may not impede measuring the morphological awareness in good readers due to vocabulary skills which were not measured in the study.

Overall, the present study found that reading was related to phonological awareness, rapid naming and morphological awareness in the poor readers while it has significant relationships with phonological and morphological awareness in the good readers. Thus, the next part provides the contributions of these variables to oral reading fluency in the two groups.

5.1.3   Contributions of PA, RAN and MA to ORF in poor and good readers.

It was found in the current study that phonological awareness, rapid naming and morphological awareness were significant predictors of oral reading fluency in either the poor readers or the good readers. These skills predicted almost half of oral reading fluency in both poor reader (47%) and good readers (44%) at the second grade. This result is in line with the findings of Lipka (2017), where phonological awareness, rapid naming and syntactic awareness are reported to be significant predictors for reading fluency.

Initially, the findings of the current study showed that rapid naming and phonological awareness together explained almost half of variance of reading fluency in the poor readers. The previous works found that phonological awareness and rapid naming are so important for explaining reading fluency in normally developing readers (Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997; Parrila,

Kirby, & McQuarrie, 2004; Vaessen and Blomert, 2010). In the current study, they were significant predictors of reading fluency in the poor readers. Still, the results are supported by the findings of the previously published studies of reading difficulties (Compton, DeFries, & Olson, 2001; De Groot et al., 2017; Wagner & Torgesen, 1987; Wolf & Bowers, 1999). Additionally, phonological awareness was found as the best predictor and a unique contributor of oral reading fluency in the poor readers, consistent with previous research about reading difficulties (Compton et al., 2001; McBride-Chang, Liu, Wong, Wong & Shu, 2012). Moreover, it was found that rapid naming had also a unique contribution to reading fluency in the poor readers. Importance of rapid naming in reading fluency is in line with the findings of earlier studies conducted with normally developing readers (Lipka, 2017; Liu & Zhu, 2016; Papadopoulos, Spanoudis, & Georgiou, 2016), with Turkish students (Babayiğit & Stainthorp, 2010, Babayiğit & Stainthorp, 2011); and with children with reading difficulties (Compton et al., 2001; Vaessen, Gerretsen, & Blomert, 2009).

Furthermore, morphological awareness did not have a significant contribution beyond phonological awareness and rapid naming in explaining oral reading fluency in the poor readers. This result seemed plausible for poor readers because phonological awareness is related to knowledge of sound and letter; rapid naming measures time of naming letters or numbers as quickly as possible with accuracy; but morphological awareness is a metalinguistic skill with the meanings of suffixes. Poor readers may be engaged in letter-sound correspondences or decoding but they do not attain reading fluency and then reading comprehension. For this reason, poor reading can be predicted by phonological awareness and rapid naming rather than morphological awareness. To clarify the relationships between reading and

morphological awareness, it will be discussed in the next section in the light of reading development theories.

On the other hand, it was found that morphological awareness is the best predictor of oral reading fluency in the good readers. Although phonological awareness explained oral reading fluency significantly without morphological awareness, phonological awareness did not have a significant contribution to explaining reading fluency if morphological awareness was placed in the model. Only morphological awareness had a unique explanation to oral reading fluency in combination of PA, RAN and MA. These findings were supported by previous research in some languages (Liu & Zhu, 2016; Lipka, 2017; Pittas &Nunes, 2014). Pittas & Nunes (2014) found that morphological awareness is the only contributor for reading in concurrent and long term analysis in the Greek language while Liu and Zhu (2016) demonstrated that it has a unique contribution to reading fluency in Chinese. Also, in Lipka's study (2017), syntactic awareness has a unique variance to reading fluency in English. Briefly, the present study with the findings about morphological awareness can give an important explanation to reading development in the Turkish language. It can be said that good readers read a text being aware of the meaning of suffixes in Turkish. Yet, the findings in morphological awareness will be discussed in the light of studies previously published in Turkish.

There was only one study about morphological awareness. In contrast to the present study, Babayiğit and Stainthorp (2010) found that morphological awareness is not a predictor for reading fluency in the second grade. This inconsistency may come from the reading level of the participants or the measurements of morphological awareness. In the current study, the good readers have certain reading performance (reading above 61 words in one minute). As stated before, the good

readers in this study perform as third grade children. On the other hand, the participants of Babayiğit and Stainthorp (2010) were randomly selected among second grade children. Therefore, the current study demonstrated that morphological awareness predicts oral reading fluency for children who do not have any reading problems. In addition to the reading level of the participants, the measurements of morphological awareness are different from the study of Babayiğit and Stainthorp (2010). Although Babayiğit and Stainthorp (2010) used only inflectional morphology for measuring morphological awareness, the present study measured morphological awareness with the derivational and inflectional morphology tasks. Eventually, it was found that derivational and inflectional morphological awareness are mostly related to oral reading fluency in the good readers, but the inflectional morphology has a weak correlation with reading fluency in the poor readers. Thus, the difference may arise from the effect of derivational morphological awareness on reading because Duncan et al. (2010) emphasized that good readers had higher points than poor readers in derivational morphology. Still, more studies about morphological awareness should be done for the clarification of its relations to reading fluency in Turkish. The next part will try to take all findings of the study from a broader perspective in the Turkish language.

5.1.4   Cognitive and linguistic aspects in reading acquisition of poor and good readers in the Turkish language

The outcomes of the current study could be interpreted with reference to the dual foundation model (Seymour, 2006). It was found in this study that phonological awareness and rapid naming are significant predictors of reading fluency in the poor readers. Thus, it can be considered that poor readers may be on the process of the

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formation phase of the model through which reading is acquired. Seymour (2006) proposed that morphological awareness is developed after reading acquisition. The findings showed that although morphological awareness is not a significant contributor to reading fluency in the poor readers, it is the best predictor of reading in the good readers. For this reason, it can be said that the results of the current study confirm to the dual foundation model of Seymour (2006) in reading development in Turkish.

On the other hand, in the current study, it was found that morphological awareness and oral reading fluency are strongly related to each other in the good readers. Also, morphological awareness was the best predictor of reading fluency in the good readers. The orthographic and morphographic phases are to acquire reading fluency in the dual foundation model of Seymour (2006). Thus, it was considered that good readers completed the process of reading acquisition and they read fluently, so they might have passed on to the morphographic phase. This result is also consistent with the assumption of Koda (2005), that morphological awareness differentiates poor and good readers. In this study, poor and good readers performed differently in morphological awareness, so the test of morphological awareness can be used for the differentiation of poor and good readers in Turkish.

Moreover, the phonological processing model holds that phonological awareness, rapid automatized naming and phonological memory activate together in reading acquisition (Wagner & Torgesen, 1987). It was found in the current study that phonological awareness and rapid naming are related to oral reading fluency, and they also have considerable contribution to reading fluency in the poor readers. Thus, this study is compatible with the phonological processing model only in poor

readers. This may be because they learn to read but good readers completed the process of reading acquisition.

Furthermore, the double deficit hypothesis was proposed by Wolf and Bowers (1999). According to Wolf and Bowers, reading problems arise with the deficits in RAN and in phonological skills. In the present study, oral reading fluency was predicted significantly by phonological awareness and rapid naming in the poor readers. This means that the poor readers may have deficits in phonological abilities or deficits in RAN or deficits in both of two functions. As a consequence, the result of the study supported the double deficit hypothesis. It can be also considered that the poor readers have similar profile to children with reading disorders who have difficulties in reading fluency (American Psychatric Association, 2013), phonological awareness and rapid naming (Wolf & Bowers, 1999) so they might be undiagnosed dyslexic students (Still, three children diagnosed with specific learning disabilities) or may be at risk of reading disability.

Apart from the theories and hypothesis about reading development, the results should be discussed in terms of phonological, orthographical and morphological structure of the Turkish language. Turkish has a transparent orthography as the phonological structure and its orthographic structure is shallow orthography which enables to learn reading in phonological codes. The current study found that phonological awareness is the best predictor of reading fluency in the poor readers, and also it has a significant relationship with reading in the good readers. Öney and Durgunoğlu (1997) found that the phonologically transparent orthography of Turkish has an important influence on early development of word recognition. Therefore, it can be said that the transparent orthography of the Turkish language gives an advantage to normally developing readers of good readers on learning decoding

quickly. On the other hand, it does not have a similar influence on the poor readers because phonological awareness and reading fluency have a reciprocal relationship in the poor readers. In other words, if a poor reader has a difficulty in reading fluency, he or she has reading problems or vice versa.

In addition to the phonological structure, Turkish is an agglutinating language and Durgunoğlu (2017) proposed that the morphological structure of Turkish may have an impact on the relationships between decoding and fluency rather than accuracy. In the present study, it was found that although morphological awareness is the best predictor of fluency in the good readers, phonological and morphological awareness explained almost half of the variance in reading fluency in the good readers. Also, there was a significant relationship between phonological and morphological awareness in both the poor and good readers. This result is compatible with the findings of the study of Babayiğit and Stainthorp (2010) which showed that phonological and morphological awareness are also related to each other. Consequently, phonological and morphological knowledge have a relationship, and good readers may benefit from the advantage of the relationship. However, the poor readers have lower performance on phonological and morphological awareness with reading fluency than good readers, so it can be said that the poor readers do not use the advantage of the phonological and morphological structure of Turkish on reading acquisition.

5.2 Conclusion

The findings of the present study demonstrated that precursors of reading achievement are different for poor and good readers. It was found that phonological awareness and rapid naming are significant predictors of reading in the poor readers

whereas morphological awareness plays an important role in reading achievement in the good readers. These relationships support the idea that the good readers and poor readers are at different stages in reading development. Although the good readers reach the morphographic stage after the acquisition of reading fluency, the poor readers are still on the formation stage at which children acquire reading.

In the poor readers, phonological awareness and naming speed are related to oral reading fluency. If a child reads slowly, he or she has low phonological awareness and naming speed. Moreover, it was found that phonological awareness is the best predictor of oral reading fluency. This is probably because the poor readers engage in sound-letter correspondences while reading. Meanwhile, that rapid naming has a unique contribution to reading fluency may underline the fact that poor readers have problems in automatization in reading. Furthermore, phonological awareness and rapid naming explain almost half the reading performance of the poor readers. As the double deficits hypothesis emphasizes the idea that reading difficulties derive from deficits in phonological awareness and/or rapid naming, this result provides supporting evidence for the double deficit hypothesis in Turkish poor readers.

On the other hand, in the good readers, oral reading fluency is correlated with phonological awareness and morphological awareness. It can be said that if a good reader reads more words, he or she has more knowledge of phonology and of morpheme. Furthermore, despite the relationship between phonological awareness and reading fluency, morphological awareness becomes the most significant predictor of reading fluency. Although phonological awareness explains significantly oral reading fluency, it does not display the predictive power of reading fluency in combination of morphological awareness and phonological awareness. A significant

proportion of reading performance is predicted by morphological awareness in the good readers.

Moreover, it was found that rapid naming is not related to reading fluency in the good readers. It can be considered that good readers acquired automatization in reading, because good readers named faster than poor readers. In contrast, rapid naming has an influence on reading fluency in poor readers because poor readers still have a difficulty in rapid naming.

Also, in terms of the relationships between phonological memory and reading fluency, the findings of the current study are compatible with previous research. It indicated that phonological memory is not related to oral reading fluency in poor and good readers.

Lastly, regarding the relationship between morphological awareness and oral reading fluency, it was found that oral reading fluency is strongly related to morphological awareness in the good readers and morphological awareness explains uniquely an important part of reading fluency in good readers in the Turkish language. Turkish is an agglutinative and transparent language, so it can be considered that the morphological and phonological structure of Turkish may help good readers to have better performance on reading fluency.

5.2.1 Implications

The results of the present study indicated that poor and good readers experience different cognitive and linguistic operations in reading development. Therefore, if the teachers determine the reading levels of the students, appropriate programs in reading can be developed for their reading levels and teachers may improve to poor and good readers' reading skills.

Initially, oral reading fluency can be used for the assessment of reading performance of children as a screening measurement. In other words, teachers or educators may administer oral reading fluency tasks to students in every grade or every month or every term to evaluate explicitly their reading levels, so poor readers or reading problems can be detected earlier. Meanwhile, teachers may differentiate activities or lessons to improve reading levels of these children so reading problems might not get worse in later grades.

In poor readers, it was demonstrated in the present study that phonological awareness and rapid naming are highly related to their reading skills like children with reading difficulties or reading disabilities (De Groot et al., 2017; Wolf & Bowers, 1999; Wolff, 2014). Thus, teachers or educators should consider these children as at risk for reading disabilities. In terms of access to accurate programs, these children need to refer to Guidance and Research Center to identification for reading disabilities or dyslexia.

Also, the current study documented the role of morphological awareness on reading fluency in good readers in the second grade. As derivational and inflectional morphological awareness increase, children read more words in one minute or vice versa. Teachers and curriculum developers should focus on morphological awareness skills in early grades for enhancing reading skills. Also, the tasks of derivational morphology or inflectional morphology which were used in the study may bring about the development of new measurements about morphological awareness.

5.2.2   Limitations of the study

Despite its important pedagogical and linguistic implications, the current study has some limitations. One of limitations was the number of poor and good readers that

may impede the generalizability of the findings. The researcher asked the teachers about the students who have reading problems in their classrooms. Some teachers said that there is no poor reader but there are many good readers in their classrooms, so it was difficult to access the poor readers. Thus, the data was collected from thirty three poor readers in eight public schools. The number of the good readers was purposefully close to the size of the group of poor readers. Therefore, the study was completed with sixty six students.

Another limitation of the current study was to divide the sample into poor and good readers. There was not a reliable norm table for oral reading fluency and teachers might be inadequate to evaluate reading skills of students. Also, since the sample size was inadequate for a cluster analysis, poor and good readers were determined within the sample. Therefore, a large group screening study which would use oral reading fluency, word reading or non-word reading task would be more beneficial to differentiate poor and good readers and so to show cognitive and linguistic profile of poor and good readers.

5.2.3   Recommendations for further research

The present study aimed to investigate the roles of phonological awareness, rapid naming, phonological memory and morphological awareness on oral reading fluency in Turkish in poor and good readers at the second grade. The study needs to be replicated with a larger group to ensure relationships of these variables with reading fluency. With a large sample size, dividing the sample group into more than two groups enables researchers to study more comprehensively for evaluating reading performance of children. Also, a longitudinal study from kindergarten to fourth grade is needed for finding out the developmental process of reading fluency in primary

schools. Moreover, it can be a cross-sectional study with all grades in order to compare the relationships of variables in poor and good readers in detailed terms.

The current study focused on poor reading and reading related skills, but the reasons of poor reading should also be handled with teaching methods of reading/writing, the effects of the curriculum, and socioeconomic factors of parents. In other words, entering these measures as control variables in the data analysis would show more clearly the contributions of phonological awareness, rapid naming, phonological memory and morphological awareness on reading fluency.

APPENDIX A

CONSENT FORM OF SCHOOL ADMINISTRATION

OKUL YÖNETİMİ İZİN FORMU

İlgili Makama;

Ben, Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü İlköğretim Bölümü yüksek lisans öğrencisiyim. Bu dönem (2015-Bahar Dönemi), tez dersi kapsamında bir çalışma yürütmekteyim. Çalışmada, okuma zorluğu yaşayan ikinci sınıf öğrencilerinin okuma ilgili bazı becerilerindeki performanslarını araştırmaktayım. Bu beceriler kapsamında, ikinci sınıf öğrencilerine morfolojik farkındalık testleri, ortografik farkındalık testi, hızlı isimlendirme testi, kelime tanıma testi, kelime bilgisi testi, kısa süreli hafıza testi, heceleme testi, fonolojik farkındalık testi ve okuma hızı testi uygulayarak veriler toplamaya çalışacağım. Testlerin tamamı, öğrenci performansına göre değişse de ortalama iki saat sürecektir. Çalışmada çocukların sıkılması, performansı etkileyeceğinden dolayı aynı çocuğa iki ayrı günde uygulanacak şekilde çalışma yapılacaktır. Öğrenci sayısına bağlı olarak, okulunuzda bulunacağım süre değişecektir. Okulunuzda, araştırmacı kimliğiyle herhangi bir eğitim-öğretim sürecinde bulunmayacağım.

Çalışma sonucunda, birkaç makale yazılarak sonuçlar eğitim konferanslarında ve eğitim dergilerinde yayınlanacaktır. Ek olarak, çalışma sonucunda elde edilen bilgiler istediğiniz takdirde, sizlerle paylaşılacaktır. Ayrıca, çalışmaya katılan öğrencilerin tüm bilgileri sadece akademik amaçla kullanılacak, başka bir amaçla kullanılmayacaktır. Öğrencilerin isimleri yazılı hiçbir materyalde kullanılmayacak ve tüm bilgileri kesinlikle gizli tutulacaktır. Araştırmada yer alan öğrenciler, istedikleri takdirde çalışmadan çekilebilirler.

Özetle, bu çalışma, okumada zorlanan çocukların hangi alanlarda zorluklar yaşadıklarını öğrenmek, ihtiyaç analizi yapabilmek ve böylece onları bu alanlarda destekleyecek materyaller ve eğitim metodları/teknikleri üretebilmek için gereklidir.

Bu araştırma için, okulunuzdaki öğrencilerle çalışmak istiyorum. Okulunuzda bu çalışmayı yapmama müsaade ederseniz, çok minnettar olacağım. Eğer çalışmaya okulunuzda izin veriyorsanız, lütfen formu imzalayınız. Katılımınız ve yardımlarınız için teşekkür ederim. Çalışma ile ilgili sorularınız, yorumlarınız ve daha fazla bilgi talebiniz olursa, benimle iletişime geçebilirsiniz.

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İzin Formu

Yukarıdaki araştırmanın içeriği ile ilgili bilgilendirmeyi okudum ve anladım. Yukarıdaki bilgileri düşünerek, aklımdaki soruları sorma ve cevap bulma şansım oldu. Çalışma sonucunda yayınlanacak hiçbir makale ve sunuda öğrencilerin ve okulun adının yer almayacağını anladım. Okulun çalışmaya katılımının tamamen gönüllülüğe dayandığını ve istediğimiz zaman hiçbir neden belirtmeksizin çekilme hakkımız olduğunu biliyorum.

Tarih:

Okul Adı: İmza

PARENT CONSENT FORM

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Okumada zorlanan ve zorlanmayan 2. sınıf öğrencilerinin okuma ile ilgili becerilerindeki performanslarının incelenmesi

Proje Yürütücüsü/Araştırmacının adı: Yrd. Doç. Dr. Nalan Babür/ Semanur Kuzucu Örge

Adresi: Boğaziçi Üniversitesi, Kuzey Kampüs, ETA-B Binası 34342 Bebek, Beşiktaş/İstanbul

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Sayın Veli,

Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü, İlköğretim Bölümü Yüksek Lisans öğrencisiyim. Bahar 2015 döneminde tez çalışması olarak bilimsel bir çalışma yürütmekteyim. Bu çalışmada, okuma zorluğu yaşayan ve yaşamayan öğrencilerinin okuma becerilerindeki performanslarını araştırmaktayım. Bu araştırma, Boğaziçi Üniversitesi Etik Kurulu onayı ve okulunuzun onayı ile yapılmaktadır. Öğrencinizin okuma zorlanıp zorlanmadığı öğretmeninden alınan bilgilere göre belirlenecektir. Öğrencilerle yapılacak bir çalışma olduğundan siz, velilerin de onayıyla çalışmayı öğrencinizle yürütmek istiyorum. Kararınızdan önce araştırma hakkında sizi bilgilendirmek istiyorum. Bu bilgileri okuduktan sonra araştırmaya öğrencinizin katılmasını isterseniz lütfen bu formu imzalayıp kapalı bir zarf içinde bana ulaştırınız.

Bu araştırmaya katılmayı kabul ettiğiniz takdirde öğrencilerinizle bazı okuma becerileri testleri yapacağım. Bu beceriler kapsamında, ikinci sınıf öğrencinize morfolojik farkındalık testleri, ortografik farkındalık testi, hızlı isimlendirme testi, kelime tanıma testi, kelime bilgisi testi, kısa süreli hafıza testi, heceleme testi, fonolojik farkındalık testi ve okuma hızı testi uygulayarak veriler toplamaya çalışacağım. Testler, kalem-kâğıt veya dinleme becerisi testidir. Testlerin tamamı, öğrenci performansına göre değişse de ortalama bir-bir buçuk saat sürecektir. Çalışmada çocukların sıkılması, performansı etkileyeceğinden dolayı aynı çocuğa iki

ayrı günde uygulanacak şekilde çalışma yapılacaktır. Bu çalışmada, çocuğunuz herhangi bir açıdan zarar görmeyecektir.

Özetle, bu çalışma, okumada zorlanan çocukların hangi alanlarda zorluklar yaşadıklarını öğrenmek, ihtiyaç analizi yapabilmek ve böylece onları bu alanlarda destekleyecek materyaller ve eğitim metodları/teknikleri üretebilmek için gereklidir.

Bu araştırma bilimsel bir amaçla yapılmaktadır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır. Testlerin sonuçları, bireysel olarak değil, grup olarak değerlendirilecektir. Öğrencilerin isimleri yazılı hiçbir materyalde kullanılmayacaktır. Çalışma sonucunda, birkaç makale yazılarak sonuçlar eğitim konferanslarında ve eğitim dergilerinde yayınlanacaktır. Bu araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında herhangi bir sebep göstermeden onayınızı çekmek hakkına da sahipsiniz.

Çalışma ile ilgili sorularınız, yorumlarınız ve daha fazla bilgi talebiniz olursa, benimle ve tez danışmanım Boğaziçi Üniversitesi İlköğretim Bölümü Öğretim Üyesi Yrd. Doç. Dr. Nalan Babür ile iletişime geçebilirsiniz.

Saygılarımla,

Semanur Kuzucu Örge
Boğaziçi Üniversitesi
Yüksek Lisans Öğrencisi

Eğer çocuğunuzun, bu araştırma projesine katılmasını kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize ulaştırın.

Ben, (Velinin adı) ...., yukarıdaki metni okudum ve çocuğumun katılması istenen çalışmanın kapsamını ve amacını tamamen anladım. Çalışma hakkında soru sorma imkanı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda çocuğumun söz konusu araştırmaya katılmasını hiçbir baskı ve zorlama olmaksızın kabul ediyorum.

Formun bir örneğini aldım / almak istemiyorum.

Katılımcı (Çocuğun) Adı-Soyadı:……………………………..

Katılımcının VELİSİNİN Adı-Soyadı:...
İmzası:.......................................
Tarih (gün/ay/yıl):........./.........../............
Telefon No: …………………….........

APPENDIX C

THE APPROVAL OF BOĞAZİÇİ UNIVERSITY RESEARCH ETHICS COMMITTEE

BOĞAZİÇİ ÜNİVERSİTESİ
İnsan Araştırmaları Kurumsal Değerlendirme Kurulu (İNAREK) Toplantı Tutanağı
2015/02
EK

20.04.2015

Semanur Kuzucu Örge
Boğaziçi Üniversitesi, Eğitim Fakültesi, İlköğretim Bölümü, Kuzey Kampüs 34342- Bebek/İstanbul
simi_rehber_58@hotmail.com

Sayın Araştırmacı,

"Okumada zorlanan ve zorlanmayan 2. sınıf öğrencilerinin okuma ile ilgili becerilerindeki performanslarının incelenmesi" başlıklı projeniz ile yaptığınız Boğaziçi Üniversitesi İnsan Araştırmaları Kurumsal Değerlendirme Kurulu (İNAREK) 2015/47 kayıt numaralı başvuru 20.04.2015 tarihli ve 2015/02 sayılı kurul toplantısında incelenerek etik onay verilmesi uygun bulunmuştur.

Saygılarımızla,

Prof. Dr. Hande Çağlayan (Başkan)
Moleküler Biyoloji ve Genetik Bölümü,
Fen-Edebiyat Fakültesi, Boğaziçi Üniversitesi,
İstanbul

Prof. Dr. Yeşim Atamer
İstanbul Bilgi Üniversitesi
Hukuk Fakültesi
İstanbul

Yrd. Doç. Dr. Ekin Eremsoy
Psikoloji Bölümü, Doğuş Üniversitesi,
İstanbul

Yrd. Doç. Dr. Özgür Kocatürk
Biyo-Medikal Mühendisliği Enstitüsü
Boğaziçi Üniversitesi,
İstanbul
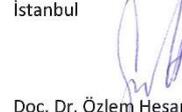
Doç. Dr. Özlem Hesapçı
İktisadi ve İdari Bilimler Fakültesi,
İşletme Bölümü, Boğaziçi Üniversitesi,
İstanbul

APPENDIX D

SAMPLE OF ORAL READING FLUENCY TEST

Mehmet annesiyle birlikte köyde yaşıyor. Bir de köpeği var. Kerpiç bir evde oturuyorlar. Onların evi tek odalı. Mehmet okula gidiyor ama şimdi okul kapalı. Tatilde, şehirdeki teyzesini ziyarete gidiyor. Teyzesi Mehmet'i uzun zamandır görmemiş. Mehmet'i görünce çok seviniyor. Sarılıp sarılıp onu öpüyor.

Mehmet lives in a village with his mother. And, he has a dog. They live in a house made of adobe. Their house is one-room. Mehmet is a student but now the school is on holiday. On holiday, he visits his aunt in town. The aunt has not seen Mehmet for a long time. She is very happy to see Mehmet. She is hugging and kissing him.

SAMPLE ITEMS FROM DERIVATIONAL MORPHOLOGY

Derivational Morphological Awareness-Yapım Eki Farkındalığı

1. Bir kız mof yapıyorsa, ona ne denir? How do we call a girl who does mof?

a) Mofçu (a person who does mof)   b) Mofluk (a place where mof is put)

2. Çaya dipek atıyorsam, çayım nasıl olur? How does my tea taste if I add dipek to it?

a) Dipeksiz (without dipek)   b) Dipekli (with dipek)

APPENDIX F

SAMPLES ITEMS FROM INFLECTIONAL MORPHOLOGY

Inflectional Morphological Awareness (True-False Judgment)

Çekim Eki Farkındalığı (Doğru/yanlış yargılama)

1. Kuş uçuyor. (True) The bird flies.

    *Kuşta uçuyor. (False) *At bird flies.

2. *Yavru kuşların iyi bakmak gerekir. (False) It is necessary to take care of

    young birds'.

    Yavru kuşlara iyi bakmak gerekir. (True) It is necesseary to take care of

    young birds.

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