PREDICTORS OF EMERGING READING SKILLS IN TURKISH: EVIDENCE FROM KURDISH-TURKISH BILINGUAL EARLY READERS

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DECLARATION OF ORIGINALITY

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- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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ABSTRACT

Predictors of Emerging Reading Skills in Turkish:

Evidence from Kurdish-Turkish Bilingual Early Readers

In Turkey, Kurdish is one of the most spoken languages after Turkish; however, there is not enough knowledge regarding Kurdish-Turkish successive bilingual children's literacy development. Hence, the current study explored the role of component processes, phonological awareness (PA), phonological memory (PM), rapid automatized naming (RAN), and vocabulary, in predicting real word reading (WRD) and pseud-word reading (PWD) abilities of Kurdish-Turkish bilingual students learning to read in Turkish. Adopting a cross-sectional research design, it investigated the relationships between reading-related components and reading outcomes by referring to the differences between grade levels. Besides, the role of linguistic and cognitive factors in contributing to word-level reading performance was explored through multiple and hierarchical regression analyses across grades. Participants were 81 Kurdish-Turkish bilingual children attending Grade 1 and Grade 2. They were tested on a battery of literacy measures in Turkish. The results indicated that second graders significantly performed better at all of the tasks compared to first graders with the exception of vocabulary. According to regression analyses, PA emerged as the strongest predictor of dependent measures assessing word reading ability at Grade 1. PM and RAN were found to be significant contributors to WRD abilities at Grade 2. Taken together, the findings of the study have shown that as the grade level increased, PA tended to lose its strength whereas PM and RAN gained more importance in predicting word reading success.

ÖZET

Türkçe'de Erken Okuma Yordayıcıları:
Kürtçe-Türkçe Çiftdilli Erken Okuyuculardan Bulgular

Türkiye'de Kürtçe, Türkçe'den sonra en çok konuşulan dillerin başında gelir. Ancak, Kürtçe-Türkçe çift dilli çocukların Türkçe'de okuma edinimi başarısını doğrudan inceleyen yeterince çalışma olmadığı görülmüştür. Bu çalışma, fonolojik farkındalık (FF) fonolojik bellek (FB), hızlı otomtatik isimlendirme (HOTI) ve sözcük dağarcığı gibi bileşenlerin çift dilli çocukların ikinci dil Türkçe'de anlamlı ve anlamsız kelime okuma becerilerindeki belirleyici rolünü incelemektedir. Kesitsel çalışma yöntemi kullanılarak, okuma bileşenleri ve kelime okuma becerileri arasındaki ilişkiler sınıflar arası gelişimsel farklılıklar bağlamında karşılaştırmalı olarak araştırılmıştır. Bunun yanında, çoklu ve aşamalı regresyon analizleri yapılarak bilişsel ve dilbilimsel bileşenlerin kelime okuma becerisine olan etkileri incelenmiştir. Çalışmaya birinci ve ikinci sınıfa devam eden 81 Kürtçe-Türkçe çift dilli öğrenci katılmıştır. Veriler çeşitli Türkçe testler kullanılarak toplanmıştır. Bulgular, ikinci sınıf öğrencilerin sözcük dağarcığı haricinde bütün diğer testlerde birinci sınıf öğrencilerinden daha başarılı performans gösterdiklerini ortaya koymuştur. Regresyon analizleri, birinci sınıflarda FF'nin anlamlı ve anlamsız kelime okuma becerilerini önemli ölçüde yordadığını göstermiştir. İkinci sınıflarda ise, FB ve HOTI'nin anlamlı kelime okuma başarısına önemli katkıda bulunduğu görülmüştür. Bulgular, sınıf düzeyi arttıkça kelime okuma başarısını belirlemede FF'nin etkisi azalırken, FB ve HOTI'nin öneminin arttığını göstermiştir.

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To all Kurdish children, who are

acquiring literacy in Turkish

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Learning to read is a vital skill for school success and plays an essential role in children's everyday endeavors later in life (Adams, 1990). Being one of the primary academic achievement of early schooling, reading is a crucial skill for not only educational success but also success for life (Bradley, 2016). Majority of the students learn to read with relative ease and almost without effort, whereas, despite efforts of educators, quite a substantial number of students continue to struggle in the reading process (National Institute of Child Health and Human Development, 2000; Snow, 2001). According to PISA results, 15-year old children in Turkey scored 428 points in reading compared to an average of 493 points in OECD countries (OECD, 2015). In the reading test, the lowest-performing region of Turkey was revealed to be the East and the Southeast Anatolia, which are highly populated by successive bilingual children who are learning to read in their second language, Turkish. Accordingly, the present study aims to explore the role of cognitive and linguistic variables in reading acquisition of Turkish among Kurdish-Turkish successive bilingual students speaking Turkish as a second language. Kurdish is mostly spoken as a mother tongue in these regions and the children's prolonged exposure to Turkish usually starts in formal school settings. A comprehensive discussion on types of bilingualism, particularly successive bilingualism will be reviewed in the literature review chapter.

Although reading simply refers to the process of matching distinctive visual codes to sound units in order to gain access to meaning, a considerable volume of research in reading has emphasized that reading is a complex and multi-

componential skill that requires an integration of several different underlying components and processes (Ziegler & Goswami, 2005). Thus far, reading research has documented phonological awareness, rapid automatized naming, phonological memory, and vocabulary as central components influencing reading acquisition in elementary school years. Herein, these components prerequisite to reading development will be presented briefly. A comprehensive review of literature on each of these reading components will be provided in the next chapter.

Phonological awareness, (PA) has been recognized as a fundamental skill in learning to read by a robust number of research in the literature (Adams, 1990; Gillon, 2007; Wagner & Torgesen, 1987). It refers to the ability to recognize, analyze and manipulate the sound structure in one's language (Anthony & Francis, 2005; Goswami & Bryant, 1990). Considerable evidence in monolingual research has indicated that the association between PA and literacy is a cross-linguistic phenomenon and it is one of the best predictors of early reading development across many languages (Czech: Caravolas, Volin, & Hulme, 2005; German: Näslund & Schneider, 1991, 1996; Dutch: de Jong & van der Leij, 2002; English: Bradley & Bryant, 1983; Kirby, Parrila, & Pfeiffer, 2003; Wagner & Torgesen, 1987; Finnish: Müller & Brady, 2001; French: Demont & Gombert, 1996; Norwegian: Engen & Hoien, 2002; Spanish: Jiménez & Ortiz, 2000; Turkish: Babayiğit & Stainthorp, 2007; Öney & Durunoğlu, 1997). Researchers have also focused on PA and bilingualism as much research shows that children speaking two languages have more advanced metalinguistic and phonological awareness skills than monolingual children (Bruck & Genesee, 1995; Campbell & Sais, 1995; Chen, Anderson, Li, Hao, Wu, & Shu, 2004; Yelland, Pollard, & Mercuri, 1993). Various work in bilingual contexts reveals that PA skills are transferred across languages in bilingual children

(Bialystok, Luk, & Kwan, 2005; Comeau, Cormier, Grandmaison, & Lacroix, 1999; Durgunoğlu, Nagy, & Hancin-Bhatt, 1993). In addition to the strong link between PA and reading acquisition, a large amount of evidence shows that phonological awareness follows a hierarchical developmental sequence from large sound units to small ones. In other words, children first learn the ability to divide speech into larger units (e.g., syllable) before they are able to divide speech into smaller units (e.g., onset/rimes and phonemes) (Anthony et. al., 2002, 2003; Anthony & Francis, 2005; Caravolas & Bruck, 1993; Cossu, Shankweiler, Liberman, Katz, & Tola, 1988; Liberman et. al. ,1974; Lonigan et. al., 1998; Treiman & Zukowsky, 1991). On the other hand, there are big variations in the developmental rate of phonological awareness across languages since different languages may facilitate the development of different levels of PA (Anthony et al. 2002). Moreover, the phonological structure of the languages in which the children are learning to read differentiates the strength of the correlation between PA and reading acquisition.

While the importance of PA is acknowledged as a crucial underlying skill in the early process of literacy development, as children become increasingly fluent readers, rapid automatized naming (RAN) has been also demonstrated to become important not only for L1 and L2 English speakers (Chiappe, Seiegel, & Gottardo, 2002; Kirby, Parilla & Pfeiffer,, 2003; Kirby, Georgiou, Martinussen, & Parrila 2010; Manis, Lindsey & Bailey, 2004; Wolf & Bowers, 1999) but also for speakers of many languages other than English (Dutch: de Jong & van der Leij, 1999; German: Mann & Wimmer, 2002; Greek: Georgiou et al., 2008; Norwegian: Lervåg, Bråten, and Hulme 2009; Norwegian/Swedish: Furnes & Samuelsson, 2011; Persian: Gholomain & Geva, 1999; Turkish: Babayiğit & Stainthorp, 2010, 2011; Sönmez, 2015). RAN refers to the ability to rapidly name a set of visually presented familiar

symbols such as letters, digits, colors or objects (Wolf & Bowers, 1999). Although there has been an ongoing debate among different theoretical positions about how naming speed is related to reading, it is widely accepted that RAN taps a number of similar cognitive processes to reading such as automatized visual recognition and access to phonological codes of stimuli from the long-term memory (Kirby et al., 2010).

Another factor that is responsible for reading achievement among beginning readers is phonological memory, (PM) defined as the ability to keep verbal material, which is coded in a sound-based representational system, in working memory (Baddeley, 1982). A line of research in the area of phonological awareness skills argues that PM is a sub-component of phonological processing ability, along with phonological awareness and naming speed (McBride-Chang, 1995; Wagner & Torgesen, 1987). Relating to its link with word reading ability, they stated that an efficient temporary storage of the sounds in decoded items enables the novice readers to devote their cognitive resources to blending sounds together and comprehension processes. On the other hand, studies yielded evidence that PM contributes a small amount of variance to the development of reading ability (Babayiğit & Sainthorp, 2007; Geva & Siegel, 2000; Gholomain & Geva, 1999; Hansen & Bowey, 1994) or influences reading achievement indirectly, via phonological awareness (Dufva, Niemi, & Voeten, 2001). PM is usually measured through the tasks that necessitates the storage of information such as repetitions of words, non-words or digits forward or backward.

Last but not least, another critical component of reading ability is vocabulary which is defined as the ability of expressing and understanding the meanings of words. Therefore, there are two different types of vocabulary and they are measured

accordingly: receptive vocabulary and expressive vocabulary (Crow, 1986). Joshi (2005) points out the importance of vocabulary in reading achievement by writing, "A well-developed meaning vocabulary is a prerequisite for fluent reading, a critical link between decoding and comprehension" (p.209). Especially for bilinguals reading in their second language, vocabulary abilities play an outstanding role in the very early stages of literacy acquisition. Besides, as comprehension of texts gains importance in later primary school, so does the vocabulary knowledge (Gough & Tunmer, 1986; Proctor, Carlo, August, & Snow, 2005; Verhoeven, 2000).

1.2 The purpose and the significance of the present study

Literacy research studying the dynamics of reading competence among beginner readers have been mainly interested in phonological awareness (PA), phonological memory (PM), rapid automatized naming (RAN), and vocabulary knowledge. However, most of the current reading models of literacy acquisition are based on the Anglo-Saxon context, a writing system that is "ill-equipped to serve the interests of a universal science of reading" (Share, 2008, p. 584). Given its exceptionally inconsistent orthography, English like languages may not necessarily account for the complex nature of reading acquisition. Therefore, over the last decades, a cross-linguistic perspective has been adopted to unveil the effects of these cognitive and linguistic skills on reading acquisition in a wide array of languages varying in orthographic depth (Aro & Wimmer, 2003; Seymour, Aro, & Erskine, 2003). To this end, it is crucial to conduct studies in other languages that has not been studied thoroughly. The current study aims to further our understanding of reading process through a highly transparent orthography, Turkish.

Besides, despite a considerable amount of research on literacy acquisition in monolingual children, there is a paucity of literature on how the knowledge of two languages creates a different stage on which it unfolds for bilingual children (Bialystok, 2007b). A large amount of monolingual children receive literacy instruction in their mother tongue whereas an increasing number of bilinguals are expected to master reading ability in their second language (Chiappe & Siegel, 1999; Chiappe, Siegel, & Gottardo, 2002; Janssen, Bosman, & Leseman, 2013; Verhoeven, 2000). Although several number of studies conducted with monolingual novice readers investigated whether these component processes predict reading in such a consistent language, Turkish (Babayiğit & Stainthorp, 2007, 2010; Güldenoğlu, Kargın & Ergül, 2016; Öney & Durgunoğlu, 1997; Sönmez, 2015). There does not exist any empirical research geared exclusively towards an understanding of literacy acquisition of Kurdish-Turkish bilingual population in Turkey.

In this respect, the present study aims to fill this gap by investigating the effects of component processes, phonological awareness (PA), phonological memory (PM), rapid automatized naming (RAN), and vocabulary, on word-level reading abilities of Kurdish-Turkish successive bilingual students speaking Turkish as a second language. The study used a cross-sectional research design and targeted successive bilingual students attending Grades 1 and 2. Since there is no educational model which has been created for the instructional needs of this group of students in Turkey (Ayhan-Ceyhan & Koçbaş, 2009), it also sought to provide a better understanding of the interplay among the different processes involved in literacy skills which will lead researchers and policy makers to produce models for bilingual children in the Turkish school system.

It should be noted from the outset that the focus of this thesis is only on Kurdish-Turkish primary school children's literacy development on their L2 Turkish, because L1 literacy in Kurdish is absent. Most of the Kurdish speaking children come to school with L1 oral proficiency but lack adequate L1 literacy skills to facilitate cross-linguistic transfer. Results from this study can lead researchers and practitioners to understand which L2 predictors make the most powerful contributions to L2 word reading and in this respect, they can plan for curricula that appropriately use these predictors when they are needed.

This chapter has provided an overview of the primary concerns of the current study. The next chapter presents a review of common models and theories of reading development as well as a review of literature on reading components. Chapter 3 provides some information about the pertinent characteristics of the Kurdish and the Turkish phonology. It also gives some information about the Turkish literacy context. Chapter 4 describes the methodology of the present study including research questions, participants, data collection instruments, procedure and statistical data analysis methods. In Chapter 5, the results of the study are reported. Finally, Chapter 6 provides a discussion on the main findings of the study. It also addresses the implications of the findings, acknowledging limitations in the research design as well as provides suggestions for further research.

CHAPTER 2

LITERATURE REVIEW

To establish a research framework for investigating reading skills, this chapter begins with a discussion on common models and theories of reading development. In the second section, the key cognitive and linguistic processes and skills that predict reading development in both monolingual and bilingual children are provided. These components are: phonological awareness (PA), rapid automatized naming (RAN), phonological memory (PM), and vocabulary. Additionally, a comprehensive review of literature relevant to the present study is presented. The reviewed literature includes the studies exploring the role of these variables in reading achievement across languages with monolingual and bilingual groups, respectively.

2.1. Models and theories of reading development: A research framework

Reading is a complex skill that requires an orchestration of several components. It is a prerequisite to the success in the workforce of the community where a considerable amount of information is communicated in written form. Considering reading as a cornerstone in the field of literacy, it has attracted the attention of many scientists and theorists. To put it simply, reading can be defined as the process of matching distinctive visual symbols to sound units in order to understand speech from written material (Ziegler & Goswami, 2005). In this definition it is emphasized that the readers need to have a rapid identification of letters, master the system which maps letters to units of speech in order to access the meanings of words. Rapid and effortless decoding of the words is an integral component of fluent reading, and unskilled decoding is often associated with poor comprehension (Durgunoğlu &

Öney, 2000). To this end, it is important to understand the processes underlying children's reading abilities. The next section presents a number of different theoretical models that have been developed to explain word recognition ability. Several key theories are reviewed here in order to obtain a better understanding of this phenomenon.

2.1.1. Developmental models of reading development

Although each of stage models of reading development has its unique features in shape, in core all propose that reading is acquired in a sequence of developmental stages: logographic, alphabetic and orthographic (Frith, 1985; Marsh et al., 1981).

The Marsh, Friedman, Welch, and Desberg model (1981) is the earliest one and it is based on Piaget's cognitive development. According to this model, children progress through four sequential stages, respectively: linguistic guessing, discrimination net guessing, sequential decoding, and hierarchical decoding. The model suggests that in each stage the child uses specific strategies for word reading. For Marsh, Friedman, Welch, and Desberg (1981), there is a developmental trend in reading skills as the child grows up. However, the predictors of reading ability will change in different grade levels. Namely, children in higher grade levels will depend more on phonological skills for reading than children in lower grades. Conversely, younger readers will use visual strategies in order to read a word.

In a revision of Marsch et al.'s basic stage model (1981), Frith (1985) proposed a stage theory of reading. According to this theory, children gain reading skill in a sequence of three stages, respectively: logographic, alphabetic and orthographic. In the logographic stage, similar to Marsh et al. (1981)'s linguistic guessing stage in which rote learning plays an essential role, children use salient

visual features and contextual cues to identify a word. At this initial stage of reading development, children will rely on their visual processing skills rather than phonological abilities to be able to read a word. At the alphabetic stage, children establish an awareness of grapheme and phoneme correspondences. Unlike the previous stage, children apply the alphabetic and phonological knowledge on to reading. Therefore, reading ability can be predicted by decoding skills. At the orthographic stage, words are recognized based on orthographic units which are larger than single letters and graphemes. Children develop a more automatized strategy to identify whole-words as they extensively analyzed letter sequences in words that they have built up in the previous stages. Frith (1985) argues that the stages are prerequisites of each other, thus children need to go through all stages successfully to master in reading. Frith's developmental model also assumes that novice readers show high reliance on phonological skills in early literacy development and they switch to orthographic skills later on. Further, it implies that there are separate routes for phonological and orthographic skills.

Ehri (1995) argues for an alternative stage model of reading in the word identification development. In her theory, Ehri labelled the phases by making alphabetical processing as central to the definition of all four phases: pre-alphabetic, partial alphabetic, full alphabetic, and consolidated alphabetic.

During the initial phase, as the name suggests, word identification does not include any sound-letter mappings. Instead, children develop links between visual contextual cues of the word and their articulation or meaning. In this sense, this phase is similar to Frith's logographic stage. In partial alphabetic phase, which Ehri (1995) coined as "phonetic cue reading" (p. 119), children make partial connections between spelling and pronunciation by developing an understanding of sound-letter

correspondences. In the third phase, the full alphabetic stage, the reader can reliably connect most of the letters in 'sight words' to their sounds. Sight words can be defined as frequent words which have been read many times before thus, their recognition can be achieved in a more accurate and automatic way. Ehri argues that the development of sight word recognition forms the core of her reading theory. Unlike Frith's theory, a complete emergence of sound-letter system for word and non-word reading, which involves phonological processing, is crucial at this stage. In the final phase, labelled as the consolidated alphabetic stage, children become more fluent and automatic in reading, along with their enlarged sight-word lexicon. This phase is equivalent to Frith's orthographic stage, where repeated sound-letter connections become consolidated or unitized through practice in reading. However, Frith (1985) views this final stage as non-phonological unlike Ehri (1994) who takes it as a phase in which sound-letter correspondence and orthographic knowledge are utilized. Ehri (2005) argues that readers make use of visual-phonological access routes instead of only visual routes in sight word reading, implying that, they still resort to phonological processing in order to access the words from their lexical memory.

Overall, Ehri's theory differs from Frith's in which the reader needs to be successful in each stage to be able to move to the next one. In other words, the phases in Ehri's theory are not clearly defined, instead the phases overlap to some extent throughout the reading development. According to Ehri's theory, as children develop in word reading, they increasingly have more complete grapheme-phoneme connections which allows them to store sight words in memory.

2.1.2 Conceptualization of word reading with reference to cognitive models

In regard to the notion of word recognition, Coltheart's (1978) dual-route model of reading is another widely accepted model among other cognitive theories of reading. This model holds that there are two independent and equally crucial mental mechanisms involved in accessing the meaning of isolated written words: (i) phonological route (non-lexical reading route) and (ii) orthographic route (lexical reading route) (Jackson & Coltheart, 2001). The readers follow the former mechanism to actively establish a phonological representation of a written stimulus by applying letter-sound conversion rules. In other words, this route allows the readers to read non-words and regular words with consistent grapheme-phoneme correspondences. For the exception words which do not conform to regular spelling-to-sound rules, an alternative, orthographic (lexical) route is used to access the meaning (Jackson & Coltheart, 2001). This involves the skilled readers' retrieval of the pronunciation of a particular learned word from their mental lexicon. When the readers visually recognize a printed word, they form a connection between the written word and the meaning from their vocabulary store which encompasses every learned word. By using this mechanism, they can recognize a word by sight alone and read it without decoding its constituent parts. Thus, this theory postulates that first a developmentally phonological access occurs, and then an orthographic access follows.

Both mechanisms in the dual route model enables word recognition in a complementary manner, meaning that both of the routes constantly interact with each other to facilitate the readers' word identification performance (Paap & Noel, 1991). It is commonly agreed that the novice beginning readers resort more to phonological decoding to help them read words since they know very few written words (Jorm &

Share, 1983). However, they also tend to rely on orthographic knowledge to identify regular words with consistent grapheme-phoneme correspondences. As they become familiar with the vocabulary items and store them in their mental lexicon, they use the orthographic route rather than needing to resort to the phonological route. So, the readers will rely more on orthographic knowledge as they acquire more vocabulary (Martin, Pratt, & Fraser, 2000). That is, they become familiar with an initially unfamiliar word after multiple successful exposures and then they can recognize it automatically as it becomes part of their sigh-word lexicon (Samuels, 1979; Horst, Parsons, & Bryan, 2011). This is in line with Share's (1995) self-teaching hypothesis, which posits that learners use phonological recoding as a self-teaching mechanism, meaning that, they read unfamiliar words via phonological skills but through sufficient practice in reading they can read them at sight without resorting to the complex process of decoding. Likewise, readers may resort to phonological decoding as a compensation strategy while reading irregular words as they also consist of smaller regular patterns (Ehri, 1992). This continuous interaction between the two routes enables the readers to identify written words by reducing the cognitive load. It further implies that rather than operating separately, both routes work in concert during literacy acquisition (Holland, McIntosh, & Huffman, 2004).

The use of these two routes depends on two main factors; (i) word frequency (Burt & Tate, 2002; Holmes & Carruthers, 1998) and (ii) the degree of consistency of the grapheme-to-phoneme correspondences among different orthographies (Frost, Katz & Bentin, 1987; Seymour, Aro, & Erskine, 2003; Wydell & Butterworth, 1999). With regard to word frequency, high frequency words can be read accurately and automatically through the orthographic route as they do not require much time to be transferred into the orthographic lexicon. The other factor is associated with how

children fine tune their reading strategies depending on the orthographic characteristic of language they speak. The orthographic system of the language is assumed to affect the route the reader will use. In other words, the language's orthographic system determines whether to use phonological or orthographic route while reading (Frost, Katz & Bentin, 1987; Katz & Feldman, 1983; Katz & Frost, 1992). In relatively transparent orthographies like Italian, Spanish, and Turkish, readers rely more on phonological processing since grapheme-phoneme mappings are more consistent in these languages compared to the ones with deep orthographies, like English.

Similarly, Goswami, Ziegler, Dalton, and Schneider (2003) indicated that the orthographic opacity, or depth, displayed by the language affect the readers' cognitive strategies in reading. Accordingly, the readers of transparent orthographies tend to rely more on the phonological route while the readers of phonologically inconsistent languages highly resort to the orthographic route. In an attempt to explain different strategies used among the readers of various orthographies, Ziegler and Goswami (2005) proposed the psycholinguistic grain size theory. This theory postulates that the orthographic depth of the language determines the readers' reliance on different psycholinguistic units. That is to say, learning to read in more consistent languages requires recoding smaller units like spelling-to-sound mappings, whereas reading in relatively inconsistent orthographies additionally necessitates small and large units. In relatively opaque languages like English, smaller grain sizes are more inconsistent than larger grain sizes. Therefore, the reader's reliance on both small-size and large-size units is inevitable in these languages (Perry & Ziegler, 2000). For instance, students reading in opaque orthographies like English employ both larger units such as letter clusters or whole word and smaller units such as

phonemes, whereas readers of more transparent languages only use small units like the manipulations of grapheme-phoneme correspondences. These cross-linguistic differences cause developmental "footprints" in reading (Ziegler & Goswami, 2005, p. 3). Consequently, the readers of opaque orthographies have to switch between different grain-size levels, which causes them to read more slowly than readers of transparent orthographies who rely only on spelling-to-sound correspondences. To this end, literacy acquisition in transparent orthographic systems is much faster than in opaque orthographies (Seymour et al., 2003). On similar grounds, Spencer and Hanley (2003) asserted that "learning to read and write in a transparent orthography maybe characterized by more rapid development of word-decoding skills than is learning to read an opaque orthography" (p. 2). However, the aforementioned word frequency factor also needs to be taken into consideration, since even in shallow orthographies readers may read words through lexical access if the word is highly frequent and previously mapped into memory. Therefore, the use of different routes does not only depend on the language's orthographic features but also whether the target word is a low or high frequency word (Seidenberg, 1985).

These influential developmental and cognitive theories which are mainly derived from the literature based on English-like languages have certainly contributed to a better understanding of the complex nature of reading acquisition. However, in order to get a more comprehensive perspective on reading competence, there is a need for discussion on crosslinguistic studies. The next section, therefore, presents a review of cross-national studies which explore the cognitive and linguistic operations underlying reading acquisition.

2.2 Predictors of reading ability in relation to monolingual reading development

Research on reading development has suggested that cognitive and linguistic factors are key components in young readers' ability to acquire early literacy skills. Additionally, the literacy research has focused on the relative and independent contributions of these factors to the reading achievement. A robust body of research has indeed suggested that phonological awareness, rapid automatized naming, phonological memory, and vocabulary are unique underlying skills involved in the reading ability. Therefore, in the following subsections we present both the definitions and the theoretical underpinnings of each component and then further elaborate on the review of previous studies exploring the role of specific constructs in early reading development of monolingual and successive bilingual children.

2.2.1 Phonological awareness in monolingual reading development

In the early 1970s, it was first recommended by Isabelle Liberman that a reader must be aware that spoken words can be divided into individual phonemes (sounds) which are symbolized in printed forms in order to learn to read in an alphabetic orthography. Thus, the ability of mapping letter and phoneme correspondences is a crucial component of learning to read in an alphabetic language (Brady & Shankweiler, 1991). Since then, phonological awareness has been considered as a critical precursor to the development of a child's reading ability. A considerable number of studies on alphabetic languages have shown that there is a strong association between children's performance on phonological awareness tasks and their reading acquisition (Adams, 1990; Brady & Shankweiler, 1991). The facilitator role of phonological awareness for beginning reading and spelling is evidenced by reading intervention programs that enhanced children's phonological awareness

skills (Blachman, 1997). It is commonly acknowledged across a wide array of languages that this skill plays an important role in preceding and influencing the process of reading acquisition. A significant amount of evidence has indicated that phonological awareness is one of the best predictors of reading achievement; in other words, children with better phonological awareness skills often tend to be better at learning the alphabetic principle and reading. On the other hand, children who have underdeveloped phonological awareness skills in preschool years become poor readers in later years (Adams, 1990; Brady & Shankweiler, 1991; Wagner & Torgesen, 1987).

Broadly defined, phonological awareness refers to one's awareness of and access to the sound structure or phonological structure of oral language (Gillon, 2007; Wagner et al., 1997). Phonological awareness act on three different levels (Gillon, 2007; Goswami &Bryant, 1990). These are syllable awareness, onset-rime awareness, and phoneme awareness (Gillon, 2007). The first level is based on syllables which requires an awareness that words can be segmented into syllables. For instance, being able to divide the word, *number*, into */nʌm/* and */bər* / can be an example of syllable awareness (Gillon, 2007). It is considered the simplest form of segmentation even for children in the kindergarten (Liberman, et al., 1974). The second level encompasses phonemes, which is based on perceiving individual sound units in speech. Understanding that words can be divided into individual sounds is called phoneme (or phonemic) awareness (Gillon, 2007). For example, the word *tree* is composed of three phonemes: */t/ /r/ /i/*. Phoneme awareness is found to be the most difficult of the phonological awareness skills (Liberman et al., 1974; Yopp & Yopp, 2009) and also the most powerful predictor of reading ability (Adams, 1990; Bradley & Bryant, 1983; Lundberg, Olofsson, & Wall, 1980;). The third level is referred as

onset-rime awareness in which children are demanded to divide each syllable into smaller units such as onset and rime. Onset refers to the initial consonant or consonant cluster of syllable and the rime, whereas rime refers to an end section which contains the remaining vowel and consonants. For example, the word *cat* involves *c* as the onset of the syllable, and *at* as the rime unit of the syllable (Gillon, 2007).

Figure 1 presents the phonological structure of the word *carpet* in a hierarchical manner:

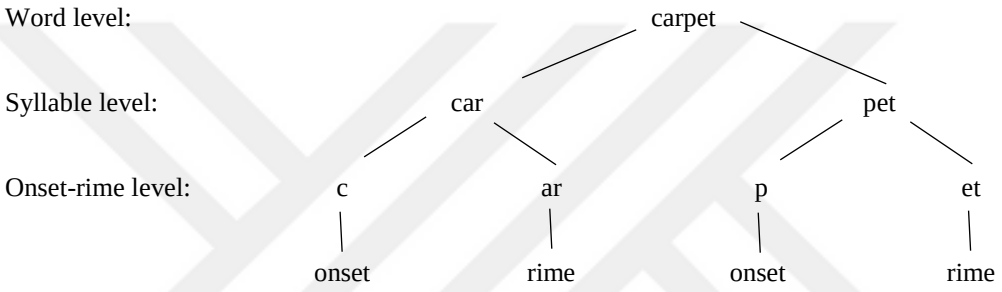


Figure 1. Phonological structure of the word *carpet*
(Adapted from Gillon, 2007, p. 4)

To optimally indicate phonological awareness, one must measure it by a test that includes tasks differing with regard to unit of word structure they focus on (Anthony & Francis, 2005). A variety of measures are utilized in the reading studies to evaluate children's knowledge of phonological awareness in three different levels (i.e., syllables, onsets, rimes and phonemes). Gillon (2007) attempts to provide various tasks of PA according to these three levels. To measure the children's syllable awareness, syllable segmentation, syllable completion, syllable identity and syllable deletion tasks are employed. To assess children's onset-rime awareness spoken rhyme recognition, rhyme detection or rhyme oddity task and rhyme generation are presented. Finally, the tasks used to measure children's awareness at

the phoneme level are as follows: phoneme matching, phoneme recognition, phoneme blending, phoneme isolation, phoneme deletion, phoneme reversal, phoneme segmentation, and phoneme manipulation (Gillon, 2007, p. 5-7). According to McBride-Chang (1995) among these tasks used by previous studies, there are three good measures which are found to isolate the phonological awareness construct from the others. These are: analyzing the position of phonemes (asking the student what comes after /r/ in /horn/?), phoneme elision (prompting the student to say /cat/ without /t/), and segmentation of phonemes (say /dish/ one sound at a time). The author also revealed that although phonological awareness tasks used in various studies differ from each other, all phonological awareness assessment tools share three main aspects: (i) The participant must first listen to one or more words or non-words; (ii) The participant must operate on that stimulus or set of stimuli; (iii) The participant is asked to give responses to the given stimuli. Thus, the participants taking phonological awareness tasks are required to perform four operations. First, the participant must perceive a speech segment. They must think about stimuli and engage in them, which represents general cognitive ability. Second, they are required to hold the speech segment in memory long enough to work on it; namely, they must remember the stimuli for a while. So, short-term memory is required for this task. Third, they must finish the operation (manipulation, deletion or identification of a speech segment). In other words, the participants must recognize the stimulus correctly and manipulate phoneme or phonemes appropriately. These perception and manipulation skills are regarded to include speech perception. Finally, they must communicate the results of this operation to the experimenter.

A large amount of evidence has now been accumulated to show that children first learn the ability to divide speech into larger units (e.g., syllable) before they are

able to divide speech into smaller units (e.g., onset/rimes and phonemes). More specifically, phonological awareness follows a hierarchical sequence by developing from large linguistic units to small ones. As Anthony and Francis (2005) put forward, children become much more aware of smaller units of words as they grow up. Therefore, they can recognize or manipulate syllables before they can recognize or manipulate onsets and rimes. Similarly, they can identify or manipulate onsets and rimes earlier than single phonemes in intrasyllabic word units. In other words, they show sensitivity to larger sound units before they are able to show sensitivity to smaller linguistic units of speech (Anthony et al., 2002). Thus, by kindergarten, children usually become fully developed in syllable awareness. However, phoneme awareness is found to develop after children begin to read (Goswami & Bryant, 1990; Treiman & Zukowski, 1996).

A large amount of studies conducted in English has demonstrated a developmental progression in phonological awareness; the ability to segment words into larger units develops prior to the ability to segment them into smaller units (Anthony et al., 2002, 2003; Caravolas & Bruck, 1993; Liberman et al., 1974; Lonigan et. al., 1998; Treiman & Zukowsky, 1991). Studies have established the same developmental progression of phonological awareness emergence in other alphabetic languages such as Italian (Cossu et al., 1988) and Spanish (Denton, Hasbrouck, Weaver, & Riccio, 2000). In addition to these studies, Ziegler and Goswami (2005) summarized a number of cross-language studies (e.g. Turkish, Italian, Greek, French, and English) that explored syllable and phoneme counting tasks and according to them, children develop phonological awareness in the same sequence regardless of the language they speak. Namely, all children develop

syllable awareness prior to phoneme awareness, suggesting that their phonological awareness develops from a larger unit to a smaller unit.

Although children speaking different languages develop phonological awareness by progressing from larger sound units to smaller ones, there are big variations in the developmental rate of phonological awareness across languages. These variations are explained by the role of phonological characteristics that individual oral languages have. (Anthony & Francis, 2005). Durgunoğlu and Öney (1999) also discuss how the oral language a child is speaking has a significant effect on the development of phonological skills. The phonological structures of all languages are different from each other. Languages differs in terms of syllables types they have or whether they have vowel or consonant harmony. Regarding the role of language specificity, Ziegler and Goswami (2005) point out that in some orthographies one letter can correspond to multiple sounds (e.g., English, Danish) and similarly, a sound can have multiple spellings (e.g., English, French), however in other languages like Italian it is usually spelled the same way. Thus, they further state that regarding the phoneme awareness, the languages which are more consistent in spelling-to-sound mapping are relatively easy to learn compared to languages in which letter and sound relationships are inconsistent. Such analyses suggest that although every child develops phonological awareness in the same sequence, the rate of the development is different for speakers of diverse languages because of language particular phonological characteristics of oral and written forms.

In addition to the discussion of developmental patterns of PA discussed thus far, the following section presents a review of previously conducted research literature exploring the role of PA in reading acquisition. As PA plays a central role in literacy development, it has drawn a great deal of attention in in the field of

literacy acquisition. In early studies, the significance of this skill to the reading development was emphasized by Stanovich (1986) who wrote "children must at some point discover the alphabetic principle: that units of print map onto units of sound…some level of explicit phonemic awareness is required for the acquisition of spelling-to-sound knowledge that supports independent decoding" (p. 363).

In the past several decades, the strong association between phonological awareness and reading acquisition has been reported in a large body of research conducted in English (Adams, 1990; Bradley & Bryant, 1983; Bryant, Maclean, Bradley, & Crossland; 1990; Stanovich, 1986; Wagner & Torgesen, 1987). There has been compelling evidence that early phonological abilities are good predictors of both initial and subsequent reading performance (Ball & Blachman, 1991; Bradley & Bryant, 1983; Wagner, Torgesen, & Rashotte, 1994; Wagner & Torgesen, 1987). Similar to English, studies with other languages with opaque orthographies has yielded evidence that children's underlying phonological awareness correlates well with subsequent reading achievement. These include: French (Comeau et al., 1999; Demont & Gombert, 1996), Dutch (de Jong & van der Leij, 1999), Danish (Frost, 2001), and Swedish (Lunberg et al., 1980). However, the studies involving languages with relatively regular orthographies have reported inconsistent and conflicting findings. Some studies have yielded similar findings with those in opaque orthographies with regard to the predictive role of PA on early reading performance (German: Näslund & Schneider, 1991, 1996; Finnish: Dufva et al., 2001; Müller & Brady, 2001; Norwegian: Engen & Hoien, 2002; Spanish: Jiménez & Ortiz, 2000), whereas other studies informed that PA does not contribute to or plays a less important role in children's future reading achievement in shallow orthographies (Dutch: de Jong & van der Leij, 1999; German: Wimmer & Mayringer, 2002; Greek:

Harris & Giannouli, 1999; Turkish: Babayiğit & Stainthorp, 2007; Öney & Goldman, 1984; Öney & Durgunoğlu, 1997).

In their groundbreaking study, Bradley and Bryant (1983) explored the predictive relationship between phonological awareness and subsequent reading and spelling abilities of preschool children. They followed 403 English-speaking children from preschool to second grade. The phonological awareness of children was measured by means of a rhyme oddity task which asseses children's ability to detect words that rhyme or to distinguish words that do not rhyme. Their study demonstrated that preschoolers' onset-rime awareness has a powerful impact on their later reading and spelling achievement in first and second grades.

In another longitudinal study, Torgesen, Wagner and Rashotte (1994) tested PA skills and word reading abilities of 288 English-speaking kindergarten children through second grade. To measure PA skills, they utilized two phoneme awareness tasks which involved identifying and blending sounds. Apart from PA skills, they aimed to measure other variables such as phonological memory and RAN that might contribute to the future word reading achievement of children. The results indicated that each phonological task contributed largely to the subsequent word reading abilities in the first and second grades whereas phonological memory and RAN did not significantly contribute to the word reading ability.

With regard to the transparent orthographies, Jiménez and Ortiz (2000) suggested that PA skills play a crucial role in learning to read in the Spanish language which shows a higher degree of orthographic transparency than English. A total of 136 preliterate Spanish children participated in the study and were followed till the end of the first grade. In this longitudinal study, they administered the measures of print awareness, PA, decoding (word reading and pseudo word reading)

and reading comprehension. They measured PA by using tasks with three levels: syllabic awareness, intra-syllabic awareness, and phonemic awareness. The results revealed that the levels of phonological awareness, particularly phonemic awareness, are related to later word reading and pseudo word reading abilities of children. However, print awareness was found to be related to reading comprehension. Among the levels of PA, phonemic awareness being the most related ability to decoding abilities is explained by the orthographic features of Spanish. That is, if the orthography of the language is relatively consistent, the word reading performance will be affected to a larger extent by phonemic awareness.

In another study conducted on a transparent orthography with highly regular letter-sound correspondences, Müller and Brady (2001) pointed out that PA skills were highly related to reading performance in Finnish. In their cross-sectional study, 80 first grade and 79 fourth grade elementary students were administered a broad array of measures including PA, naming speed, decoding (accuracy and speed), listening and reading comprehension. The results indicated that at the end of the first grade, PA was strongly related to the reading ability which was measured by reading comprehension and decoding (accuracy and speed). As for the fourth graders, PA was found to be only significantly related to decoding accuracy by explaining 10% of variance. The result of this study suggest that PA skills were significantly related to the reading abilities in a highly transparent writing system.

The findings of Müller and Brady's (2001) study contradict with other studies which report that the effect of PA diminishes as a reliable predictor since students progress to higher grade levels in orthographically transparent languages (Furnes & Samuelsson, 2010). In their cross-linguistic study, Furnes and Samuelsson (2010) investigated the role of the two main linguistic skills, PA and RAN, in predicting

reading (i.e., sight word reading and phonological decoding) and spelling abilities among English, Norwegian, and Swedish children. Students were tested from kindergarten through Grade 2 on parallel measures of PA and RAN. The results indicated that the contribution of PA to reading faded away in transparent languages, Norwegian and Swedish compared to English which has opaque characteristics. However, RAN was shown to be a long term predictor of reading ability in less deep orthographies, Norwegian and Swedish, compared to an orthographically opaque language, English. Along the same line, Caravolas and colleagues (2013) mentioned that "Some authors have argued that in consistent orthographies, phoneme awareness is a less important, and RAN a more important, predictor of variations in reading ability than in English" (p. 1399).

Of particular relevance, in their early studies Öney and Durgunoğlu (1997) had reported similar findings in their longitudinal study exploring early reading acquisition in a highly transparent writing system, Turkish. They tested first grade children's performance on measures of PA, letter recognition, word and pseudo-word recognition, spelling, and listening comprehension three times during the year. The result of the study suggested that PA contributes to word recognition abilities only during the early stages of reading acquisition. They noted that the highly regular sound-symbol correspondences in Turkish language led children reach ceiling levels in PA skills towards the end the Grade 1.

In sum, the aforementioned monolingual studies have suggested that PA skills are predictive of children's subsequent word-reading abilities in inconsistent orthographies. However, it is worth noting that in consistent orthographies, PA as an indicator of later decoding abilities can be contradictory as suggested by some studies mentioned above.

As the research line discussed above suggests, rapid automatized naming, RAN is among the widely studied cognitive constructs that contributes greatly to reading, along with PA. Hence, the next subsection of this chapter provides an overview of studies regarding the relation of RAN to reading development.

2.2.2 Rapid automatized naming in monolingual reading development

Over the last two decades today, Rapid automatized naming (RAN) has emerged as another possible correlate and predictor of reading ability which accounts for a significant amount of variance in predicting reading performance over and above phonological awareness (Wolf & Bowers, 1999). A task called rapid automatized naming or RAN (Denckla & Rudel, 1976) have been used to assess the speed with which children name the printed lists of stimulus on the chart as rapidly and as accurately as possible (Wolf, Bally, & Morris, 1986). These highly familiar items to be named commonly include common objects, colors, digits or letters. As these stimuli are over learned and highly familiar to the children, they can name them automatically and rapidly.

Yet there is no consensus among researchers as to how RAN is related to reading. There has been an ongoing debate with regard to the extent to which RAN is a phonological processing measure or is independent of phonological processes. The first line of research studying within the phonological core deficit framework argues that RAN is an aspect of phonological processing along with phonological awareness and phonological coding in working memory. This view characterizes poor readers as having deficits in different aspects of phonological processing and RAN as being related to deficits in accessing phonological information from long-term memory (Snowling & Hulme, 1994; Wagner & Torgesen, 1987; Wagner et al., 1994; Wagner

et al., 1997). Wagner et al. (1997) define phonological naming as “the rapid retrieval of phonological codes from permanent memory” (p. 469), which conceptualize it as an aspect of phonological processing.

A second view by researchers such as Bowers and Wolf (Bowers & Wolf, 1993; Wolf & Bowers, 1999) argue that RAN taps a distinct process from a phonological process. They accept the importance of phonological processes in word reading and RAN having some phonological components (e.g., retrieving and naming various symbols). However, they argue that slow naming speed is not caused by deficiencies in phonological processing but by the dysfunction in the ability to form orthographic representations (Wolf & Bowers, 1999). This line of research is grounded in the double deficit hypothesis. According to this hypothesis while some readers have a deficit in phonological processing, others are particularly deficient in naming speed, however, there are still some other readers who are poor at both phonological processing and naming speed. Stating RAN as a distinct process unrelated to PA, they further argue that it plays a prominent role in predicting reading development across a variety of languages, regardless of their orthographic complexity. Conversely, the relationship between PA and reading differs across orthographies which differ in complexity.

This theoretical position also holds that RAN is distinct from PA as it promotes orthographic processing (Bowers & Wolf, 1993; Manis, Seidenberg, & Doi, 1999; Sunseth & Bowers, 2002). Orthographic processing emerges when groups of letters or whole words are processed as single whole lexical units rather than as a series of letter-sound correspondences (Kirby et al., 2010). It is considered as a mechanism through which the reader can recognize the very frequent or familiar words rapidly as sight words without using decoding strategies (Ehri, 1992; Ehri,

1997). Thus, as sight words are similar to visual stimuli in RAN tasks, word reading and naming speed indicate remarkable correlations with each other by acting the same way in accessing the mental representations. To this end, it can be predicted by some studies that RAN may be a stronger predictor of reading development in opaque languages than in transparent languages as the former necessitates the ability to form orthographic representations. Along with the orthographic features of the language in which the study was conducted, the reading measures utilized in different studies may lead to diverse results (Kirby et al., 2010). In other words, early reading research in the English language has been dominated by the prediction of reading accuracy whereas research in transparent orthographies has favored the prediction of reading speed (Share, 2008). The studies below are reviewed to understand the contribution of RAN to reading in opaque as well as in transparent languages by taking these factors into consideration.

To begin with, Manis, Seidenberg, and Doi (1999) investigated the contributions of RAN, verbal ability, and PA to the prediction of phonological and orthographic skills from Grade 1 to Grade 2. Phonological skills were measured through non-word reading tasks and orthographic skills were measured through orthographic choice, word-likeness judgement, and exception word reading. The results indicated that both RAN and PA accounted for independent variance in later reading performances although vocabulary and prior reading skills were entered first in the regression analysis. RAN was also found to make significant unique contributions to both reading accuracy and speed but a stronger relationship with speed measures. Another striking finding was that RAN was a stronger predictor of three tasks demanding orthographic information (orthographic choice, word-likeness

judgement, and exception word reading) but had a weaker effect on non-word reading ability whereas PA was a stronger predictor of non-word reading skill.

Similar findings were reported by Kirby et al. (2003) who followed 161 English-speaking children from kindergarten to the fifth grade. The children were administered tests annually measuring PA and RAN skills along with some control variables like letter knowledge, verbal and nonverbal intelligence. They aimed to examine the relative effects of PA and RAN in predicting various reading skills including non-word and real word reading measures. Similar to Manis et al.'s (1999) findings, RAN had a weaker effect on non-word reading ability in comparison to real word reading measure. Additionally, despite a high correlation between PA and RAN, they accounted for independent variance in both reading tasks, real word and non-word reading accuracy. PA was a stronger predictor in explaining kindergarten and Grade 1 reading performances while RAN was found to be more powerful in the higher grades. That is, the early strength of PA as predicting reading ability declined over the years. The researchers offered that in the early stages of reading, particularly in a relatively inconsistent orthography such as English, PA is essential. In later grades, the automatization of grapheme-phoneme correspondences enables children to rely more on orthographic knowledge, which are tapped by RAN.

As for transparent orthographies, de Jong and van der Leij (1999) investigated the relations between the development of PA, PM, and RAN and the development of word decoding skills in a sample of 166 Dutch speaking children from kindergarten through second grade. The children's word decoding skills were measured through real word and non-word decoding speed tasks. They found that PA measured at the beginning of Grade 1 had an additional effect on word decoding skills measured at the end of Grade 1 even after they controlled the effect of word

decoding at the onset of the first grade. However, the effect of PA on word decoding faded away after first grade. They also found that RAN had an influence on the children's word decoding abilities but it was also seemed to be limited to the duration from kindergarten to the end of first grade. In languages with consistent grapheme-phoneme correspondences, it is expected that RAN had a large effect on the development of word decoding speed. Nonetheless, the result of this study did not support this notion as RAN was restricted to the initial stages of reading development in a transparent orthography, Dutch.

Similar findings were reported by Lervåg, Bråten, and Hulme (2009) who conducted a two-year longitudinal study in a transparent orthography of Norwegian. Based on a sample of 228 Norwegian children from first grade to the end of second grade, they investigated the relationship between a range of cognitive and linguistic skills (e.g., letter knowledge, PA, RAN, short-term memory) and word-level reading speed. The authors found that early reading skills seemed as a unitary construct but they turned into correlated subskills as such: word decoding, orthographic choice, text reading, and nonword reading. They also reported that PA predicted variations in word-level reading skill through the first grade but not thereafter, which aligns well with findings from studies in regular orthographies (e.g., de Jong & van der Leij, 1999). However, the influence of RAN as a longitudinal predictor was revealed to be consistent in later reading abilities even after some variables were controlled.

Of particular interest, Babayiğit and Sainthorp (2010) examined the role of PA and RAN in reading and spelling development. They followed 57 Turkish speaking children from the first grade to the second grade. Word reading ability was measured through word reading fluency, non-word reading fluency and agglutinated word reading fluency tasks. The findings showed that RAN was a strong and

consistent longitudinal predictor of reading speed and its predictive role was significant even after the effects of other predictors and prior reading abilities were controlled. PA was revealed to be related to spelling accuracy skills while it did not show any significant contribution to word reading abilities of children.

The previous sections presented a general overview of literature focusing on the contribution of PA and RAN to the development of reading skill across different languages. Another cognitive component of reading ability is phonological memory, PM which is not studied as extensively as other components yet has been indicated to contribute to reading achievement. Thus, in the following section, the studies regarding the role of PM in the reading achievement across languages will be presented.

2.2.3 Phonological memory in monolingual reading development

PM, phonological memory, can be defined as the ability to hold verbal, familiar or unfamiliar information which is coded in a sound-based representational system (Baddeley, 1982). According to Wagner et al. (1994), PM is the ability to decode words into phonemes and to process this information in the short-term storage. Naming it as phonetic recoding to maintain information in working memory, Wagner and Torgesen (1987) regarded PM as a subcomponent of phonological processing along with phonological awareness and phonological recoding in lexical access (RAN). Relating to its link with word reading ability, they stated that an efficient temporary storage of the sounds in decoded items enables the novice readers to devote their cognitive resources to blending sounds together and comprehension processes. It comprises a store and a rehearsal process (Wagner & Torgesen, 1987).

PM is usually measured through the tasks that necessitate the storage of information such as repetitions of words, non-words or digits forward or backward.

The role of phonological processing abilities in reading development has been studied largely and their crucial role has been acknowledged in the literacy field. However, most of these studies are directed at the relative role of PA and RAN. The studies that have investigated the influence of PM on reading outcomes have obtained inconsistent and mixed results.

To begin with a study conducted in English, Wagner et al. (1994) explored the role of PA, PM, and RAN on the subsequent word reading abilities of 244 children by following them from kindergarten through the second grade. Wagner and collaborators did not find a direct association between PM and word reading abilities of kindergarten and the first grade children. However, PA was found to have a high correlation with subsequent word reading abilities.

Different from many studies reviewed previously, Dufva et al. (2001) particularly focused on the relative effect of PM on the word recognition ability. In their longitudinal study, they followed 222 Finnish preschoolers to the second grade. They aimed to explore the role of PA and PM in reading abilities measured at the end of each grade level. The reading ability was measured through word recognition and reading comprehension tasks. PM was measured through three different memory span tests: word span, sentence span, and digit span forward test. They found that PM had a weak effect on PA at preschool level, and thus, it had a weak indirect influence on word recognition at Grade 1. To put it simply, PM had an impact on PA, and through this effect, it influenced word recognition abilities of the first grade children. Thus, they explained the effect of PM as an indirect influence whereas PA as the most significant precursor of word recognition. In line with these findings, the

study by de Jong and van der Leij (1999) which is reviewed above reported that PM was a weaker predictor of early word reading abilities of Dutch speaking children than PA and RAN.

On similar grounds, Babayiğit and Stainthorp (2007) investigated whether PA and PM measured in kindergarten would significantly contribute to the later reading and spelling performances in a highly transparent orthography, Turkish. The children were followed from kindergarten through the second grade. Reading abilities were measured through real word and pseudo-word reading fluency tasks and reading speed task. The results indicated that preschool PA did not significantly contribute to subsequent reading abilities, whereas, preschool PM had a strong predictive influence on reading skills over the years. Of particular interest to mention, the authors interpreted the weak effects of PA by relating it to the extreme transparency of the writing system in Turkish. The most striking result to emerge from this study was that PM was the strongest longitudinal correlate of reading speed.

To conclude, the research on the relation between PM and reading development has yielded inconsistent and mixed results. Thus far, the studies examining the role of PA, RAN, and PM in predicting early reading development have been summarized. As oral language skills and reading performance is closely related, the studies focusing on the relative role of vocabulary knowledge in predicting reading ability beyond other reading-related components will be provided in the next section.

2.2.4 Vocabulary knowledge in monolingual reading development

One of the important components of reading ability is vocabulary which refers to the ability of expressing and understanding the meanings of words. There are two

different types of vocabulary and they are measured accordingly. Receptive vocabulary refers to the knowledge of understanding a word while reading or listening it and it is measured by asking the participant to select a picture that matches with the given verbal referent of an item. On the other hand, expressive vocabulary is described as the ability of knowing about a word in order to use it while speaking or writing and it is measured by showing the participant a picture and asking the verbal referent that matches with the picture (Crow, 1986). Within the scope of the present study, vocabulary knowledge was measured through expressive vocabulary task.

Placing an emphasis on the role of vocabulary knowledge in fluent reading, Joshi (2005) argued that "developing a larger vocabulary is often a critical factor in improving reading comprehension" (p. 215). Vocabulary showed a strong predictive power in cross-linguistic reading research examining the reading comprehension development. It was proposed that while PA plays an essential role in decoding, other components of oral language, for example vocabulary and listening comprehension, are crucial for the development of reading comprehension (Hoover & Gough, 1990). However, there is a handful of research geared exclusively towards an understanding of the relation between vocabulary and basic word reading skills.

Strattman and Hodson (2005) compared the performances of the second grade beginning readers on a range of tasks including PA, RAN, PM, and receptive vocabulary with their English word decoding and spelling scores which measured concurrently. PA was measured by the task of phonemic awareness and non-words were used for testing the decoding ability. PA was shown to account for the greatest amount of variance for decoding and spelling. The results also revealed that along

with PA and PM, receptive vocabulary contributed an additional variance to word recognition, which was small but significant.

Vocabulary knowledge assessed with expressive vocabulary tasks has also explained variations in word reading skills. In a longitudinal study, Nation and Snowling (2004) examined the relationship between language skills and reading development, following children from the age of 8 to 13. Together with PA, oral language skills measured by expressive vocabulary and listening comprehension tasks were unique concurrent predictors of reading comprehension and word recognition at time 1. In addition, expressive vocabulary, listening comprehension, and semantic skills contributed unique variance to reading comprehension, word recognition and exception word reading in the long run, even when they controlled for the autoregressive effects of the early reading ability. Nation and Snowling (2004) supported a connectionist model of reading development "in which to consider the interplay of phonological and meaning-based factors in word recognition development" (p. 353).

In a cross-sectional study of a more transparent language, Greek, Protopapas, Sideridis, Mouzaki, and Simos (2007) focused on the relations between vocabulary (both receptive and expressive), word reading and reading comprehension performance of Greek children in the second through fourth grades. They found that the unique contribution of word-level reading to reading comprehension became insignificant after vocabulary measures were entered into the hierarchical regression analyses, especially for the higher grades. Therefore, the authors argued that the influence of decoding on reading comprehension may be mediated by the vocabulary, consistent with lexical quality hypothesis which emphasizes a relation between decoding and comprehension.

In contrast to these findings, Muter, Hulme, Snowling, and Stevenson (2004) did not find any associations between vocabulary knowledge and word recognition abilities of very young readers attending Grade 1 and 2. The authors suggested that there may exist a stronger association between vocabulary and reading in the later elementary years. A recent longitudinal study by Schatschneider, Fletcher, Francis, Carlson, and Foorman, (2004) who followed kindergarten children through second grade showed that oral language measured through expressive and receptive vocabulary accounted for only small variance of word recognition in the first and second grades after controlling for other reading-related components such as PA and RAN.

Taken together, research on monolinguals provided evidence that vocabulary knowledge did not significantly predict early reading development of children at the beginning of elementary years whereas in later years its contribution seemed to be stronger.

As can be noted from the research line given above, there is a great bulk of studies conducted with monolingual children with regard to the predictive roles of PA, RAN, PM, and vocabulary, however there remains the question as to whether the same pattern is followed by the children learning to read in a language other than that of spoken at home. In regards, the following section will first shed light on bilingual influences on reading development and then, will provide a comprehensive review of studies pertinent to bilingual context by focusing on the relation of each component to reading performances of bilingual children.

2.3. Reading development in bilingual children

The majority of countries around the world are either bilingual or multilingual (Dewaele, Housen, & Wei, 2003) and Turkey is no exception with its people coming from diverse language backgrounds. Making up the largest minority population among the minority community, Kurdish children usually learn to speak their first language, Kurdish, at home. For most of them, their systematic and substantial exposure to Turkish begins not before they start formal schooling. Most of Kurdish children are exposed to their second language after they have mastered their mother tongue. Hence, this form of bilingualism can be called as sequential or successive bilingualism as opposed to simultaneous bilingualism. As Haznedar (2013) points out, the issue of age of onset in the child L2 acquisition literature has widely been discussed. A number of researchers (e.g., Schwartz, 2003; Unsworth, 2005) have suggested different age ranges for successive/sequential bilingualism. On the other hand, the same amount of exposure in both languages from birth is needed to be regarded as simultaneous bilingual (Bhatia, 2006). Bilingual children need to be exposed to their first and second languages and have input from each language in a sufficient degree in order to have command of both languages equivalently (Oller & Eilers, 2002). The bilinguals who have reached the mastery of two languages in a roughly equal degree are called balanced bilinguals. This is unfortunately rarely the case in the Kurdish community. Conversely, depending on the amount of the exposure, some bilinguals remain stronger in their first language or switch to their stronger second language, which emerges as their dominant language (Watson, 1991). The emergence of dominant bilingualism not only depends on the quantity of exposure but also the quality of input the child receives in each language. The children in the current study have used their first language for informal

communication at home while they have received their second language at school or from public media. Although most of them have been exposed to both languages from birth, they have not necessarily maintained equally balanced proficiency in two languages as the context of languages is different. Therefore, bilingual children go through similar developmental phases as monolinguals in either of their languages whereas the knowledge of two languages leads to a different picture. Young bilinguals raised in homes where two languages are spoken or where the home language differs from that of society were reported to mix the two languages. In later stages, they are found to code-switch between both languages in a purposeful way depending on the linguistic context (Bialystok, 2007a).

Being raised as a bilingual may indicate advantages or disadvantages, since "bilingualism is clearly a factor in children's development of literacy, but the effect of that factor is neither simple nor unitary" (Bialystok, 2007b, p. 45). Mentioning advantages of bilingualism, in linguistic interdependence hypothesis, Cummins (1979) hypothesized that the bilinguals who mastered their first language in sufficient levels can acquire a second language in high levels. Cummins (1979) puts forward "To the extent that instruction in a certain language is effective in promoting proficiency in that language, transfer of this proficiency to another language will occur, provided there is adequate exposure to that other language" (p. 87). He argued that if the children are encouraged to develop literacy skills in their mother tongue, a high level of L2 attainment is also likely to occur by the positive transfer of knowledge and literacy skills from first language to the second language acquisition. Hence, this theory by Cummins (1991) predicts that children learning to read in their first language will improve literacy skills in their L1 and will use the academic

language skills acquired in L1 in order to learn lexicon, acquire literacy and attain language proficiency in their L2.

There is ample evidence showing cross-language transfer of some reading aspects gained in first language to the second language. Numerous studies have indicated cross-linguistic transfer of phonological awareness in L1 on reading development in L2 among primary school children, namely, phonological awareness in one language seems to have influence on the reading level in another language (Comeau et al., 1999; Durgunoğlu et al., 1993).

Evidence of cross-linguistic transfer of phonological awareness was shown in a study by Comeau et al. (1999). English-speaking children enrolled in French immersion programs were tested on word decoding and phonological processing skills (phonological awareness, lexical access, and verbal working memory) in both English and French. The focus of the study was to investigate cross-language transfer of PA and also relative effects of PA, RAN, and PM in predicting word reading ability. Thus, only the result regarding cross-linguistic transfer will be provided as this study will be re-reviewed in the PA subsection below. The results showed that bilingual children's PA abilities in French and English were strongly correlated, which provided evidence for cross-language transfer of PA and word decoding skills.

In a more comprehensive study, Bialystok et al. (2005) compared four groups of first grade children on early literacy tasks. In three of the groups, the children were bilinguals with different first languages as Spanish, Hebrew, Chinese but learning English and the children in the fourth group were English-speaking monolinguals. The authors hypothesized that bilinguals develop literacy different than that of monolinguals for two reasons. Firstly, bilingual children develop prerequisite skills for literacy development such as PA, PM, and vocabulary differently from

monolingual children. Secondly, when the bilinguals are biliterate, they may transfer the skills they have acquired in one of their languages to reading in the other. The study revealed that the bilingual children in Hebrew and Spanish group performed significantly better than those in Chinese group and monolingual group on reading skills, indicating the resemblance between the two languages' writing system (e.g., Hebrew-English and Spanish-English) lead to a larger advantage on reading measures even after literacy-related skills, PA, PM, and vocabulary were controlled. Bilinguals were also found to transfer literacy skills across languages only when both languages were written in the same alphabetic system. The authors concluded that to exploit bilingual advantage for early reading, there should be a relation between the two languages and writing systems.

Regarding the disadvantages of bilingualism, some studies showed that bilingual children have more restricted vocabularies in their both languages compared with their monolingual peers (August, Carlo, Dressler &Snow, 2005; Scheele, Leseman, & Mayo, 2010). Further evidence was indicated by Verhoeven (2000) who compared the reading and spelling development of monolingual Dutch speaking children with minority children speaking Dutch as a second language in the first and second grades of primary school. Minority participants were from various language backgrounds but most of them had Turkish and Moroccan origins. The children were tested on a range of metalinguistic and literacy skills including word decoding, word spelling, reading comprehension skills, and receptive vocabulary knowledge. The findings revealed that after two years of formal education, minority children could keep up with their Dutch peers on word decoding skills whereas they lagged behind their Dutch peers with respect to the development of vocabulary knowledge and reading comprehension. The author suggested that children with poor

L2 proficiency are required to enhance their L2 oral skills before formal L2 literacy instruction starts, for instance, in preschool and kindergarten. As above study suggests, the disadvantages mostly manifest in the acquisition of literacy in a weak language, namely, when the language of the school differs from the language the child speaks at home. Not only the literacy skills but also oral language proficiency of this bilinguals is poorer compared to their monolingual peers (Bialystok, 2007b).

Taken together, the studies on bilingual's reading development is diverse and inconclusive as there are various forms of bilinguals and different kinds of language pairings. In most of these studies, bilingual children had literacy instruction in both of their languages whereas in the present study, the Kurdish-Turkish bilingual students only received literacy instruction in Turkish, which is their second language.

Now that different aspects of bilingualism, the bilingual influence on reading, and transfer effects of reading-related skills have been discussed, in the next subsection the research examining the relation of reading components PA, RAN, PM, and vocabulary to bilingual reading development will be reviewed, respectively.

2.3.1 Phonological awareness in bilingual reading development

The role of phonological awareness in predicting monolingual reading ability has been studied broadly (Wagner & Torgesen, 1987; Wagner et al., 1994), whereas there are not many studies investigating the relationship between phonological awareness and reading acquisition among bilingual children. Several studies compared bilingual children with their monolingual peers and indicated that being exposed to more than one language may enable bilingual children to have more heightened levels of phonological awareness than monolingual children (Bruck & Genesee, 1995; Campbell & Sais, 1995; Chen et al., 2004; Yelland et al., 1993). First

the studies examining the effects of bilingualism on PA development will be reviewed and then, we will launch into the literature investigating the relative contribution of PA to second language reading performances of bilingual children.

Comparing English-French bilinguals attending French immersion schools with English monolinguals on their specific PA skills, Bruck and Genesee (1995) found that bilingual children scored better on syllable segmentation tasks than their monolingual peers. This achievement was attributed to the saliency of French syllable. However, monolingual children attained higher scores on phoneme awareness tasks, which was attributed to their learning literacy in their first language (English) as opposed to the bilingual group who were learning to read in French as a second language. Therefore, second language acquisition enabled the bilingual readers to process phonological stimuli different than their monolingual peers.

These results mirror those of Campbell and Sais (1995) who examined bilingual children's metalinguistic skills in kindergarten. Bilingual Italian-English pre-school children were found to be superior at both semantic (sorting by meaning) and phonologically based (sorting by initial sound and morpheme deletion) tasks compared to their monolingual English speaking peers.

On the other hand, higher PA among bilinguals may be due to the languages they are exposed to. Bialystok, Majumder and Martin (2003) found that higher PA among bilingual children may be due to the languages that bilinguals speak. They investigated the phonological abilities of Spanish-English and Chinese-English bilinguals by comparing them to their monolingual peers. The result of the study showed that only the Spanish-English bilingual group performed higher on a phoneme segmentation task. They concluded that bilingualism in itself may not be an advantage but being bilingual in specific languages may be. Thus, children who

speak languages that are similar to each other in terms of phonological structure and alphabetic orthographic system may have some advantage when learning to read in their second language.

Whether or not bilingual children have superior PA skill, it is acknowledged that PA facilitates literacy acquisition process of bilingual readers. Studies involving bilingual children who are acquiring literacy in their two languages concurrently (Comeau et al., 1999; Mumtaz & Humpreys, 2001) as well as research with ESL learners who are learning to read in English only (Chiappe & Siegel, 1999; Chiappe, Glaeser, & Ferko, 2007; Jongejan, Verhoeven, & Siegel, 2007) have offered contradictory findings about the contribution of PA to the second language reading performance in bilingual children.

The importance of PA in word decoding is reported in a one-year longitudinal study conducted by Comeau et al. (1999). English-speaking children enrolled in French immersion programs were tested on word decoding and phonological processing skills (PA, RAN, and PM) in both English and French. The results indicated that PA accounted for significant proportion of variance in word decoding in both languages even when controlling for age, gender, cognitive ability, and the other two components of phonological processing skills, RAN and PM. The study result also showed that bilingual children's PA abilities in French and English were strongly correlated, which provided evidence for cross-language transfer of PA skills.

In a more recent study, Chiappe et al., (2007) investigated the roles of speech perception and phonological processing in reading and spelling acquisition for Korean-English bilingual and English monolingual children in the 1st grade. They found that speech perception and phonological processing predicted early reading

skills in English for both language groups although phonological representation of the two languages are different from each other. More specifically, the study also revealed that PA contributed more significantly to the development of decoding skill among the Korean-English bilingual children.

Choosing both young (1st and 2nd grade) and slightly older (3rd and 4th grade) children as participants, Jongejan et al. (2007) compared monolingual English speakers to English language learners who were the speakers of different first languages. They examined the relation of PA, RAN, PM and syntactic awareness to word reading and spelling abilities. They also compared L1 and ESL children's performances on these variables. The results showed that PA development of ESL children were similar to that of L1 children. In contrast to the findings reported by Bruck and Genesee (1995) and Campbell and Sais (1995), there were not any evidence for heightened levels of PA on the part of the L2 learners; however, ESL children were found to perform better on RAN. PA in grade 1 and 2 was reported to be the strongest predictor of decoding in grade 3 and 4 for both ESL and monolingual group. After PA, the only variable that predicted ESL word reading and spelling ability was RAN.

Chiappe and Siegel (1999) conducted a study to explore whether the same component processes are involved in reading acquisition for ESL and native English-speaking beginning readers. The performance of first grade 88 children was examined on tasks measuring word reading ability, pseudo-word reading, PA, RAN, and syntactic awareness. The performance profiles of Punjabi-speaking children resembled to those of monolingual English-speaking children on word recognition and phonological processing tasks. L1 and ESL children also showed similar error patterns in word reading task. The results also confirmed that phonological

awareness and phonological recoding shared a significant link to reading ability for both native and non-native speakers of English. In other words, the good readers in both groups had higher levels of PA whereas the poor readers in both groups had lower levels of PA.

Of particular relevance to the current study, Mumtaz and Humpreys (2001) investigated the effects of a shallow orthography, Urdu, on the reading development in a deeper orthography, English. Hence, they compared bilingual Urdu-English and monolingual English children whose ages ranged between 7-8, on the tasks of reading, memory and phonological processing skills. They found that while the bilingual children had more difficulty in reading irregular English words, they were more proficient at reading regular words and non-words compared to the monolinguals. The poor performance with irregular English words was linked to deficient visual memory skills. However, their better performance in regular words and non-words was proved to be related to their ability to exploit a non-lexical, phonological route in reading. Their enhanced phonological skills in their first language enabled them to perform better on real and non-word tasks.

It is obvious that the existing literature with regard to PA and second language acquisition is far from cohesive, whereas it is accepted that PA plays a critical role in the process of reading development. It is worth mentioning that most of studies reviewed above have examined the role of PA in the process of reading with samples of bilinguals learning to read in English or French. However, as Cummins (1989) puts forward, one should be cautious in applying the findings of the studies carried out in languages different than the target population. The next section briefly reviews studies on the relation of RAN to bilingual children's early reading skills.

2.3.2 Rapid automatized naming in bilingual reading development

Studies on monolingual reads have shown that although PA plays an important role in the early process of literacy, RAN may become increasingly crucial as children become more fluent readers. The extensive monolingual research has revealed that RAN independently contributes to word reading skill in addition to PA. However, there is little research investigating the relation between RAN and reading development among bilingual children (Chiappe, Seiegel, & Gottardo, 2002; Gholamain & Geva, 1999; Manis, Lindsey & Bailey, 2004).

In a comprehensive study, Chiappe et al. (2002) investigated the impact of linguistic factors on the development of early reading skills in English in kindergarten children from diverse linguistic backgrounds: native English speaking children (NS), bilingual children speaking English as well as another language at home (BL), and ESL children exclusively speaking a language other than English at home. The children were assessed on tasks related to basic word reading skills, PA, RAN, PM, and syntactic awareness at the beginning and end of kindergarten. The findings revealed that PA measured in kindergarten was an important predictor of first grade English word reading skill for all language groups, namely, for both NS and children coming from various linguistic backgrounds. The main finding was the robust effect of PA to English word reading skill, whereas, RAN which was employed at the onset of kindergarten was also revealed to significantly predict English word reading skills measured at the end of kindergarten for all language groups.

Similar findings were reported in a longitudinal study by Manis et al. (2004) who explored the development of English word reading skills in a sample of 251 Spanish- speaking English language learners participating in an early-transition

bilingual program. They investigated the relation of print knowledge, expressive vocabulary, PA, and RAN measured in kindergarten with word reading skill measured in second grade. They sought to find the unique contribution of four predictors of English in first grade to English word reading, independent of the correlation of Spanish skills in kindergarten. English RAN, coming after English PA skill, was found to be second strongest predictor of English word reading in second grade.

Gholomain and Geva (1999) explored the role of underlying cognitive constructs as RAN, PM, and L2 oral language proficiency, in understanding the concurrent development of real word and pseudo-word reading in English(L1) – Persian (L2) bilingual students attending Grades 1 to 5 in a Persian Heritage Language Program in Canada. The study revealed that although the two languages differed in terms of orthographic system and in the level of proficiency, the same cognitive factors, PM and RAN, accounted for significant variance on the L1 and L2 basic reading skills. L1 and L2 RAN was found to be a significant predictor of word and pseudo-word reading skills within and across languages. In addition to this, the study showed an evidence for script dependent hypothesis. In other words, although Persian is their second language and they are less proficient in this language, once the students learn grapheme-phoneme correspondences rules in Persian, they can read unfamiliar Persian words as accurate as they decode English words. The authors argue that the regular orthography of Persian enabled bilingual children to favor phonological route to lexical retrieval and thus, they rapidly gained accurate decoding skills.

Taken together, the previous studies with both monolingual and bilingual novice readers has shown that RAN contributes independently to word recognition

during the early stages of reading development. In the next section, a relatively less studied component, PM and it's the relation to early reading development of bilingual children will be discussed through some noteworthy studies.

2.3.3 Phonological memory in bilingual reading development

Although few studies have focused merely on PM, previous research with monolinguals has reported the contribution of PM to word reading via its relation with PA (Dufva et al., 2001) or as a weak predictor of reading ability (de Jong & van der Leij, 1999; Kirby et al., 2003). In the area of bilingualism, there are only a handful of studies measuring the role of PM and some studies reviewed above did not report any significant contributions of PM (Chiappe et al., 2002; Comeau et al., 1999; Jongejan et al., 2007;) interestingly however, some others viewed PM as an important component implicated in word reading ability (Geva & Siegel, 2000; Gholomain & Geva, 1999; Swanson, Saez, Gerber, & Leafstedt, 2004).

With a special focus on PM, Swanson et al. (2004) investigated the predictive role of PM and WM, working memory, in second language acquisition and reading in English. Spanish-English bilingual, Spanish monolingual and English monolingual first grade children were compared on following measures: PM measures including pseudo-word reading task, digits forward and backward, and letter and object naming speed tasks, WM measures involving rhyming, semantic association, visual matrix tasks as well as reading and vocabulary measures. The results demonstrated that PM was importantly related to second language acquisition and English word reading ability. Besides, both PM and WM was shown to be predictive of English vocabulary and word reading.

Consistent with these findings, Gholomain and Geva (1999) focused on the role of PM along with other reading-related components such as RAN and L2 oral language proficiency. Since this study has already been reviewed in bilingual RAN subsection above, only the results regarding PM will be provided. The results showed that among all measures, PM in Persian was shown to be a more reliable predictor of English word reading and pseudo-word reading skills than PM in English.

In a more comprehensive study focusing on a highly transparent orthography as a second language, Geva and Siegel (2000) examined the word and pseudo-word reading skills of 245 elementary school children (from kindergarten to grade 5), learning to read concurrently in English which is their first language and Hebrew which is their second language. The authors investigated to what extent these early reading skills can be explained by orthographic transparency or alternatively, by common underlying cognitive processes. The latter was tested through PM which was measured by parallel L1 and L2 memory tasks. The findings provided a partial support for cognitive abilities, namely, regardless of orthography, L1 and L2 PM explained significant but limited amount of variance on basic reading skills in both languages. The findings also yielded evidence for orthographic depth hypothesis (Katz & Frost, 1992). As L2 Hebrew involves a consistent orthography, children could read it more accurately than they do in English which has a deeper orthography. Although the children were less proficient in their L2 Hebrew, they appeared to develop their basic word reading skills with relative ease.

Along with PA, RAN, and PM, the predictive role of vocabulary knowledge in reading performances of bilingual children has been extensively studied as it is closely related to L2 language proficiency. Thus, the following section below will

present studies investigating the effects of second language vocabulary levels on reading outcomes in bilingual children.

2.3.4 Vocabulary knowledge in bilingual reading development

Being an aspect of proficiency in the spoken language, vocabulary has generated considerable interest among researchers who contribute to understanding how children controlling two oral systems become literate. Bialystok (2007b) argues that bilingual children who acquire literacy in their weak language lag behind their monolingual peers with regard to their oral language skills and they are considered to require between 2 and 5 years to reach age standards. She further discusses that learning to read in a weak language will be more complicated for the child than coping with the symbolic function of print in a more familiar language. "Bilingual children will undoubtedly have different levels of oral proficiency in their different languages" (Bialystok, 2007b, p. 51).

Although it is a fact that bilingual readers have more limited vocabulary than monolinguals speaking each of two languages bilinguals have (Ben-Zeev, 1977; Bialystok, 1988; Cobo-Lewis, Pearson, Eilers, & Umbel, 2002; Muter & Diethelm, 2001; Verhoeven, 2000), they keep up with their monolingual peers in their word recognition abilities in the primary grades (Durgunoğlu, et al., 1993; Geva, Yaghoub-Zadeh, & Schuster, 2000; Lervåg & Aukrust, 2010; Lesaux & Siegel, 2003; Verhoeven, 2000). Studies that have addressed to the contribution of oral vocabulary knowledge to word reading ability have produced inconsistent findings.

Over a two-year period, Geva et al. (2000) followed and compared English as a Second Language (ESL) children coming from a variety of linguistic background with same-aged English as a First Language (EL1) children. They investigated the

role of phonological processing skills, language proficiency, and Rapid Automatized Naming (RAN) assessed at the end of Grade 1 and at the onset of Grade 2 in predicting EL1 and ESL word recognition skills assessed at the end of Grade 2. Although PA and RAN were found to significantly predict word recognition abilities of both EL1 and ESL groups, language proficiency measured by receptive vocabulary was not revealed to be a significant predictor of word recognition skill in either language group.

Muter and Diethelm (2001) investigated phonological skill, vocabulary and letter knowledge of kindergarten children speaking English (English L1) as a native language and children from diverse linguistic backgrounds (Non-English L1) being educated in English. The data was first collected when the children were in kindergarten and the second testing took place one year later when the children were at the first grade. When the English and non-English L1 groups combined, vocabulary was found to have a high correlation with word reading ability measured in the same year (first grade). However, when the two groups treated separately, vocabulary proved a nonsignificant concurrent determiner of reading ability in either group of children. Similarly, non-English L1 children's kindergarten vocabulary knowledge scores did not significantly predict their word reading skill a year later.

These findings are in line with those of Durgunoğlu et al. (1993) who investigated the factors contributing the English word identification performance of Spanish-speaking first grade bilingual readers. The results demonstrated that neither English nor Spanish oral proficiency tests measured by listening comprehension, vocabulary, and language comprehension and production have any significant correlations with word-identification performance. These observations suggested that oral proficiency independently is not a very reliable predictor of reading abilities in

bilingual children, especially in the early years of learning to read. In other words, vocabulary knowledge may contribute to subsequent reading abilities as children progress from word decoding to the mastery of more advanced text (Durgunoğlu et al., 1993; Muter & Diethelm, 2001).

In clearly understanding the potential influence of vocabulary knowledge on word recognition skills, Jean and Geva (2009) conducted a research with older elementary school children. They sought to examine the development of vocabulary in grade 5 ESL and EL1 children and the role of vocabulary in predicting word recognition ability. The children were followed for two consecutive years and were tested two times (in grade 5 and in grade 6) on a range of cognitive, linguistic and reading measures including PM, RAN, PA, L2 vocabulary knowledge, and word recognition tasks. To investigate the role of "deep" vocabulary knowledge in word recognition, they employed both receptive and written root word vocabulary tasks. According to findings, in both the EL1 and ESL groups, receptive and root word vocabulary together consistently accounted significant variance for individual differences in word recognition concurrently and longitudinally, even after the contributions of PA, RAN, and PM. However, they concluded that considering the effect of PA, a small proportion of additional variance on word recognition was explained by vocabulary knowledge.

Although Gottardo (2002) conducted a research with bilingual children in early elementary school years, he also indicated a relationship between L2 vocabulary knowledge and word reading. He examined how linguistic variables including phonological processing and vocabulary knowledge relates to word reading ability in low socioeconomic status Spanish-English bilingual children who were tested throughout their first grade year. The results indicated that although its relation

to word reading performance was not as strong as English phoneme deletion performance, English (L2) receptive vocabulary knowledge was related to English word reading performance. Gottardo (2002) suggested that bilingual children's familiarity with English oral vocabulary aid in English word recognition by enabling them to fine-tune their approximate pronunciation of a printed word to match that of an actual English word.

Given that the languages spoken by the participants of the current study is Kurdish and Turkish, it is crucial to know the particular linguistic structures of these two orthographies. Hence, Chapter 3 presents an overview of the pertinent characteristics of Kurdish and Turkish phonological structures.

CHAPTER 3

CHARACTERISTICS OF KURDISH AND TURKISH ORTHOGRAPHY

This chapter provides a brief overview of the pertinent aspects of Kurdish and Turkish languages. First, the phonological features of Kurdish vowels and consonants are presented. Then, the characteristics of the Turkish language are introduced. Finally, how children are taught literacy skills in Turkey is presented.

3.1 Kurdish phonology[1]

Kurdish belongs to Indo-European Family of Languages. It is a continuum of the Western Persian languages. It is an inflecting language and has a morphological ergativity.[2] The Kurdish writing system which is based on the Latin alphabet has a predictable sound-symbol correspondence between the phonemes and letters. Thus it can be described as transparent as there is a direct correspondence between graphemes and phonemes. There are 31 letters in the alphabet, 8 of which are vowels.

The basic Kurdish vowel system includes eight vowels, five long (or full) vowels, and three short (or weak) vowels. The full vowels (/i/, /e/, /a/, /u/, and /o/) are generally perceived phonetically long, especially in open syllables. However, the vowel length is not phonemically distinctive in Kurdish. Some examples are as

[1] The term Kurdish refers to the Kurmanji dialect of this language group throughout the thesis. Kurmanji is a major northern dialect of Kurdish spoken by Kurds of Turkey, Eastern Syria, the Caucasus and some parts of Iran (Aygen, 2007).

[2] Ergative languages displays an object-verb agreement whereas in accusative languages like Turkish there is a subject-verb agreement. Kurmanji Kurdish shows an ergative patterning in case marking and verbal agreement with past tense forms of transitive verbs. To this end, Kurmanji Kurdish is known to be morphologically ergative (Haig, 1998).

follows: *agir* [a:gɨr] ‘fire’, *êvar* [e:var] ‘evening’, *bîne* [bi:næ] ‘bring!’, *bûk* [bu:k] ‘bride’, and *zozan* [zo:zan] ‘alpine summer settlement’.

The vowels /ʊ/ and /æ/ are realized more centrally than the full vowels. They are less inclined to lengthening in open syllables. They may also take place at the end of words. Some examples are as follows: *em* [æm] ‘we’ and *xurt* [xʊrt] ‘strong, sturdy’.

The vowel /ɨ/ has two varieties (the lexical central vowel and epenthetic central vowel) although both varieties are written with the same letter < i > in the standard orthography. The lexical variety of this vowel occurs in the stems of lexical items as in the example of the word *mij* [mɨʒ] ‘fog, mist’. However, the epenthetic version is used to maintain syllable structure rules that do not allow for consonant clusters in syllable onsets and codas. An epenthetic vowel can be inserted in syllable-onset clusters as in the example of *spi* [sɨpi:] ‘white’ or in syllable codas especially in verb infinitives such as when the infinitive ending *–n* is attached to the past stem of the verb *dît*, an epenthetic /ɨ/ is inserted: *dîtin* [dîtɨn] ‘see’ (Haig & Öpengin, 2015). Kurdish vowels and their correspondences to the IPA forms are demonstrated in Table 1.

Table 1. Kurdish Vowels

	Long/Full		Short/Weak	
	Front	Back	Front	Back
High	î= /i/	û = /u/		i = /ɨ/ u = /ʊ/
Mid	ê = /e/		e = /æ/	
Low		a = /a/ o = /o/		

Source: Bedir Xan & Lescot (2000, p. 19)

As for the Kurdish consonant phonemes as it can be seen from Table 2, there are two varieties of the sound <r>. If it occurs at the beginning of the word, it is trilled but in other environments the distribution is not predictable. Example for a trilled <r> is [kær] 'deaf' and for a flap version is [kʰæɾ] 'donkey'. As an example for pharyngealized segments is [ʕeli:] 'Ali' or [teʕm] 'taste'.

Table 2. Kurdish Consonants

	bilab	lab.-dent.	dent.	alveol	post-alv.	pal.	vel.	uvul.	pharyn.	glott.
Plosives	pʰ p b			tʰ t d			kʰ k g	q		ʔ
Fricatives		v f		ʃ ʒ			x ɣ	ʁ	ħ ʕ	h
Affricates				ʧʰ ʧ ʤ						
Nasals	m			n			ŋ			
Trill				r						
Flap				ɾ						
Approx.	w					j				
Lateral				l (dialectally also ɬ)						

Source: Haig & Öpengin (2015, p. 14)

With regard to the syllable structure in Kurdish, they are composed of eight possible syllable types which are in the form of V (conjunctive *û* meaning 'and'), CV (*rû* meaning 'face'), VC (*êş* meaning 'pain'), CVC (*ber* meaning 'produce'), CCV (*qrêj* meaning 'dirty'), CCCVC (*stran* meaning 'song'), CVCC (*berf* meaning 'snow'), and CCVCC (*stêwr* meaning 'infertile'). Among these syllable structures, CCCVC type is extremely rare. In addition, open syllables are very rare in Kurdish. If they occur, the vowel is a long vowel (Aygen, 2007).

3.2 Turkish phonology

Turkish has a phonologically transparent orthography, namely, it has a regular mapping between graphemes and phonemes. Turkish orthography is based on Latin alphabet and it has a very regular spelling to sound correspondences. In other words, each letter in Turkish orthography directly corresponds to one phoneme. There are 21 consonants and 8 vowels in the Turkish alphabet (Öney & Durgunoğlu, 1997).

The consonants of Turkish are distinguished from each other in terms of manner of articulation, point/place of articulation, and whether they are voiced or voiceless (Erguvanlı-Taylan, 2015). As for the place of articulation, consonants are categorized as bilabial, labio-dental, dental, alveolar, alveo-palatal, palatal, velar, and glottal. With respect to the manner of articulation, consonants are classified into seven categories, which are stops, plosives, affricates, fricatives, nasals, laterals, and glides (see Table 3).

Table 3. Turkish Consonants

	Bilabial	Labio-dental	Dental	Alveolar	Alveo-palatal	Palatal	Velar	Glottal
Plosives	*p* *b*		*t* *d*			*c* *ɟ*	*k* *g*	
Affricates					*tʃ* *dʒ*			
Fricatives		*f* *v*	*s* *z*		*ʃ* *ʒ*		*ɣ*	*h*
Nasals	*m*		*n*					
Tap (Flap)				*ɾ*				
Lateral			*ɬ*		*l*			
Glide						*j*		

Source: Erguvanlı-Taylan (2015, p.11).

Turkish has an eight-vowel system which has three main distinctive features. Firstly, vowels are categorized as front or back vowels (backness) depending on the position of the tongue in the mouth. Secondly, they are classified as high, mid or low (height) depending on the distance of the tongue from the roof of the mouth. Finally,

vowels are classified as rounded or unrounded (rounding) reflecting the shape of the lips (Erguvanlı-Taylan, 2015). Turkish vowels are summarized in Table 4.

Table 4. Turkish Vowels

	Front		Back	
	Non-round	Round	Non-round	Round
High	*i*	*y (ü)*	*ɯ (ı)*	*u*
Mid	*e*	*œ (ö)*		*o*
Low	*ɛ*		*a*	

Source: Erguvanlı-Taylan (2015, p. 17).

One of the most fundamental characteristic of Turkish phonology is vowel harmony. Vowel harmony proceeds from left to right along syllables. In vowel harmony, any of the eight vowels (a, e, i, ı, o, ö, u, ü) may appear in the initial syllable of a word, but each subsequent vowel is shaped by the vowel immediately preceding it. Therefore, the subsequent vowel is assimilated by the preceding vowel in terms of frontness and rounding (Durgunoğlu & Öney, 1999). Vowel harmony may occur within morphemes and across morpheme boundaries. Thus, when a suffix is attached to a stem, it harmonizes with the characteristics of the vowel in the preceding syllable (Kornfilt, 1997). For example, the plural morpheme *ler* transforms into *lar* when it follows a word that has *a* or *o* in its final syllable, but it stays the same when it follows a word that has *i* or *e* in its final syllable (Öney & Durgunoğlu, 1997).

There are four basic syllable forms in Turkish language (V, VC, CV, CVC) and these constitutes ninety-eight percent of all Turkish syllables. The most frequent syllable type is the CV structure and it constitutes fifty percent of all Turkish syllables. Therefore, syllabic boundaries are very clear in Turkish words and it is very easy to divide the words into syllables. As common syllable structures are not

composed of consonant clusters, phonemes in the syllable are also relatively easy to identify. Considering these specific characteristics, syllable awareness is attained earlier in Turkish compared to other languages like English (Durgunoğlu & Öney, 1999).

3.3. Turkish literacy instruction context

In Turkey, the instructional methods and approaches are the same for Turkish monolingual and Kurdish-Turkish bilingual children in school settings. The particular reading instruction methodology, the phoneme based sentence approach, is the same for all of the schools and starts at the first grade. This method was first introduced by the Ministry of National Education in 2005 and places a great emphasis on the instruction of phonemes (the smallest unit of speech) instead of letter names in words. The syllables are formed with the phonemes/letters taught in groups. Then, the students learn to blend syllables into words and words into sentences. Along with word decoding, spelling of the words are instructed at the same time (MEB, 2005). According to the National Reading Panel reports (2000), "the focus of systematic phonics instruction is on helping children acquire knowledge of the alphabetic system and its use to decode new words, and to recognize familiar words accurately and automatically" (p. 90). As the Turkish language is largely phonemic, meaning that it has a high one-to-one letter-sound correspondence, this method is believed to be appropriate for the phonemic structure of the Turkish language. It is also considered that this method contributes to children's language development and makes the shifting from the oral language to the written language easier (MEB, 2005). Based on the new reading instruction method regulated by Ministry of National Education, first graders learn

letters/sounds in a specific order. To this end, the first group of sounds is *e, l, a, n* and they are followed by *i, t, o, b, u.* The students learn the sounds along with combining the newly acquired sounds into new words through reading and writing (e.g., el, ele, Ela, lale, anne, in, il, tane, Ata, Talat, on, bebe, baba, Tuna). After they learn a certain amount of words and sentences by combining these sounds together, they acquire the remaining phonemes. The remaining groups consist of the sounds *k, ı, r, ö, s, ü* and *m, d, ş, y, c, z* followed *by ç, g, p, h,* and *f, v, ğ, j* (Sidekli & Balcı, 2016).

In this chapter, the linguistic structures of Kurdish and Turkish were provided by focusing on their consonant, vowels, and syllable structures. Besides, a brief overview of literacy instruction in Turkey is presented. Chapter 4 presents a detailed description of methodology employed in the current study, including research questions, characteristics of participants as well as specification of instruments and testing procedures.

CHAPTER 4

METHODOLOGY

The present chapter is composed of five subsections: research questions and hypotheses, participants, instruments, procedure and data analysis. In the first section, the research design is presented along with the research questions and the hypotheses of the study. The subsequent sections introduce the detailed descriptions of participants, data collection instruments, and the procedure followed for the test administration. Finally, in the data analysis section, the methods employed in order to analyze the data are explained.

4.1. Research questions and hypotheses

The aim of the current study is to investigate the role of phonological awareness (PA), rapid automatized naming (RAN), phonological memory (PM), and vocabulary in predicting real word reading (WREAD) and pseudo-word reading (PWD) performances of Kurdish-Turkish successive bilingual children in their early elementary years. To this end, a cross-sectional research design was adopted in the present study to determine the aspects of reading development for Kurdish-Turkish bilingual children attending Grade 1 and Grade 2. In the light of what has been discussed in the previous literature, this study attempts to address the following research questions:

1. Is there a significant difference between Grade 1 and 2 Kurdish-Turkish bilingual children in terms of their PA skills, RAN performance, PM, vocabulary, WRD and PWD abilities in Turkish?

2. What is the relationship of PA, RAN, PM, and vocabulary with WRD and PWD performance in Turkish? Does the pattern of the relationships among the measures differ across Grade 1 and 2?
3. Do PA, RAN, PM, and vocabulary make significant contributions to real word reading (WRD) performance in Kurdish-Turkish bilingual children in Grade 1 and 2?
4. Do PA, RAN, PM, and vocabulary make significant contributions to pseudo-word reading (PWD) performance in Kurdish-Turkish bilingual children in Grade 1 and 2?

Based on the research questions, the following predictions are hypothesized:

1) Given the developmental growth of these abilities, there will be a statistically significant difference between the performances of first and second graders with regard to PA, RAN, PM, and vocabulary as well as WRD and PWD abilities. Although it is acknowledged that students learning to read in a rather transparent orthography, Turkish, have very high levels of PA at the early stages of reading acquisition, the first graders in the current study will perform poorer compared to second graders as they are at the very beginning stages of literacy acquisition.

2) For the first graders, it is hypothesized that PA skills will demonstrate high levels of correlations with both reading measures whereas RAN will not correlate with both reading measures as strongly as PA, since this grade level has not developed automatization skills yet. PM and vocabulary will have low correlations with reading skills at this grade level. RAN will show higher correlations with reading measures as the grade level increases since the children's dependence on phonological skills will diminish at Grade 2. Hence, PA will show lower correlations than RAN in

second grade. Nonetheless, PM and vocabulary are assumed to correlate with reading skills but not as strongly as PA and RAN.

3) It is hypothesized that PA will make a significant unique contribution to WRD in the first grade whereas its effect will diminish in the second grade. Thus, RAN will explain a large amount of variance in the second grade due to its influence on reading as the grade level increases. In transparent orthographies like Turkish, it is relatively effortless for readers to establish grapheme-phoneme correspondences. As such, given that it does not place heavy demands on PA when reading develops, it is expected that PA should be a less reliable predictor in the second grade. A small proportion of variance may be explained by vocabulary, especially in the second grade since the effect of vocabulary to reading is higher over years. Hence, the influence of PM and vocabulary is expected to be weaker than other components in predicting WRD abilities of bilingual children at both grade levels.

4) PA will make a significant unique contribution to PWD ability in the first grade and likely to make an additional contribution in the second grade as children rely more on phonological route by using grapheme-phoneme correspondences while reading pseudo-words. In addition to PA, RAN will make significant contribution to PWD at Grade 2 as children get more automatized in their reading skills at this stage of literacy. PM is not expected to contribute to PWD as much as PA and RAN do at both grade levels. Vocabulary is likely to make a small proportion of variance to PWD especially in the second grade.

4.2. Participants

The participants were 81 Kurdish-Turkish bilingual students attending first and second grades in three different state primary schools. The schools were located in

three different villages of Muradiye, a district in the city of Van. These villages were chosen as they were predominantly populated by Kurdish-speaking people. The schools were selected based on voluntariness of school administration, teachers and families in participating in the study. Initially 85 bilingual students were randomly selected from these schools. However, two students were excluded from the sample as they were unwilling to complete all the tests. Two other students were excluded as they had some learning difficulties, as acknowledged by their teachers. The final sample was 81 students with forty students from first grade (20 boys and 20 girls, mean age of 74;3) and forty-one from second grade (19 boys and 22 girls, mean age of 86;6). According to the interviews with the teachers, none of the children had any special disability (e.g., sensory impairment, autism, learning difficulties). The socio-economic status based on family income was very low, as indicated by school administrations.

It was not possible to interview parents about literacy and language use at home due to time constraints, so, information regarding the extent to which the Kurdish language was used at home was confirmed through interviews with classroom teachers. As indicated by the teachers, the children spoke Kurdish as their mother tongue and their systematic exposure to Turkish usually started upon formal schooling. However, they were being exposed to Turkish through television and visits to the city every now and then, so, they achieved some level of bilingualism by the first day of school. As acknowledged by school teachers, in early primary grades their Kurdish language abilities, in particular oral language skills are certainly stronger. Consent forms from parents were taken for all students in order to participate in the study.

Table 5 illustrates the demographic information about the participants (i.e., age and gender by grade).

Table 5. Participants Demographics

Grade	Gender		Age (Months) M	SD
1	Male	20 (50%)	74.3	.38
	Female	20 (50%)		
	Total	40		
2	Male	19 (46.3%)	86.6	.41
	Female	22 (53.7%)		
	Total	41		

4.3 Data collection instruments

The present study included a broad range of tests which were constructed by different researcher groups. The Turkish versions of the tests were developed by researchers based on the standardized English tests by considering language-specific features of Turkish language. The participants were given the following six tests: Test of Phonological Awareness Skills Screener (Fonolojik Farkındalık Tarama Testi [FFTT], Babür, Çekerek, Erçetin, Haznedar, Müderrisoğlu), Turkish Test of Rapid Automatized Naming (HOTIT: Hızlı Otomatik İsimlendirme Testi, Bakır & Babür, 2009, 2018), the Turkish Version of WISC-R for Children- Revised (Savaşır & Şahin, 1995), Picture Vocabulary (Ercetin, Haznedar, & Babür), Turkish Test of Word Reading Efficiency (KOBIT: Kelime Okuma Bilgisi Testi, Babür, Haznedar, Erçetin, Özerman, & Erdat-Çekerek, 2013).

4.3.1 Turkish phonological awareness skills screener (FFTT)

The children's phonological awareness skills in Turkish were assessed through Fonolojik Farkındalık Tarama Testi (Phonological Awareness Skills Screener), which was originally developed by Mather in collaboration with Podhajski, Rhein and Babur and adapted to Turkish by Babür et al. (2009). In the current study, eleven subtests from the FFTT were utilized to measure the participants' PA skills: phoneme deletion, phoneme blending, phoneme recognition, phoneme segmentation (words), phoneme segmentation (non-words), syllable deletion, syllable blending, syllable segmentation, sound discrimination, rhyme recognition, rhyme production.

Phoneme deletion (FFTT)

It consists of 10 items and measures the child's ability to delete target phonemes within words in Turkish. The child is given a word orally and asked to repeat it. Then, the child is asked to say the word again but this time, with the target phoneme deleted. The target phoneme is typically either the initial phoneme or the last phoneme of the word. For example, the examinee is asked, "Say *hindi* [turkey]. Now say it again but don't say */h/*. The expected response is *indi*.

Phoneme blending (FFTT)

This 16-item test measures the ability to combine the speech sounds to form a whole word. The child is required to combine verbally presented phonemes to form a word. For example, the examinee is asked, "What word do these sounds make: */k/ /u/ /ş/*?" The expected answer is *kuş* [bird].

Phoneme recognition (FFTT)

This 10-item test measures the examinee's ability to recognize the initial sound of a spoken word and produce another word with the same sound. The children are required to detect the initial sound of the words and then, tell another word starting

with the same sound. The examinee, for instance, is presented with the word *köpek* [dog] and asked to tell another word that starts with the same sound. The answer could be *kuş* [bird].

Phoneme segmentation- Real words (FFTT)

This 10-item test measures the ability to separate sounds that form a real word. It requires the children to separate words into individual sounds. For example, the examinee is given the real word, *kuru* [dry]. He or she is then asked to break out it into separate sounds as in the following: Say "*kuru"*. "Now say kuru one sound at a time?" *K-u-r-u* is the expected response.

Phoneme segmentation- Nonwords (FFTT)

This 10-item test measures the ability to separate sounds that from a pseudoword. It requires the children to divide non-words into their sounds The examinee, for example, is given the nonword, *rük.* He or she is then asked to divide it into its phonemes as in the following: Say "*rük"*. "Now say rük one sound at a time?" *R-ü-k* is the correct answer.

Syllable deletion (FFTT)

Similar to phoneme deletion task, this 10-item test measures the ability to delete target syllables within words. It requires the participant to eliminate a syllable (initial or final) from the word. For instance, the administrator prompts the examinee with "Say *resim* [picture]. "Now say it again without *re*". The correct answer is *sim*.

Syllable blending task (FFTT)

This 10-item test measures the ability to combine the syllables to form a whole word. The child is given a word orally that is broken into syllables and then, asked to blend the syllables s/he heard to say a word. The examinee, for instance, is asked "What word do these syllables make: */bay/-/rak/*?" The answer is *bayrak* [flag].

Syllable segmentation (FFTT)

This 10-item test measures the ability to separate words into individual syllables. It requires the children to identify syllables in a word. For example, the subject is asked, “How many parts are there in the word *kaşık* [spoon]?” The correct answer *ka-şık*, which makes two syllables.

Sound discrimination (FFTT)

This subtest includes 10 items that measures the child’s ability to discriminate the sounds of given word pairings. The child was simply demanded to answer whether two orally presented words were the same or different. The participant, for instance, is given the words ‘*çam cam*’ [pine glass] and asked to tell if the word pairing is same or different. The correct answer is “They are different”. In order to prevent the examinee from ‘lip-reading cues’, the experimenter hid her mouth by a piece of paper.

Rhyme recognition (FFTT)

This 10-item subtest is administered to measure the participants’ ability to recognize rhyming words. The children are given three words and asked to tell the two rhyming ones. The subject, for example, is given the words “*ışık: şeker, kaşık* [light-candy-spoon]*”* and asked to say which two words end with the same sounds. The correct answer is *ışık-kaşık*.

Rhyme production (FFTT)

This 10-item test assess the participants’ ability to produce a word that rhymes with the target word. The children are asked to generate words that rhyme with the target word given by the experimenter as in the following example: “Tell me a word that rhyme with *boş* [empty]?” The answer could be *hoş* [nice].

All the subtests measuring children's phonological awareness include 10 items, except for the phoneme blending task which consisted of 16 items. Four practice items were presented in each subtest to ensure that all children knew what they were required to do in the target task. Each correct answer on the subtests was scored as 1 point. The total numbers of correctly responded items determined the child's scores on each subtest of FFTT. Each subtest was suspended after four consecutive errors of the participants.

4.3.2 Turkish test of rapid automatized naming (HOTIT: Hızlı otomatik isimlendirme testi)

Rapid automatized naming was assessed through the administration of Bakır and Babür's (2009, 2018) Hızlı Otomatik İsimlendirme Testi (HOTIT), test for digits which corresponded exactly to the original Denckla and Rudell (1976) digit naming task. Among the four subtests of RAN (colors, objects, digits, letters), the current study employed the digit naming task as it has been reported that alphanumeric RAN tasks, digits or letters, predict reading abilities better than nonalphanumeric RAN tasks, colors or objects (Savage & Frederickson, 2005; Schatschneider et al., 2004). Additionally, subtests of colors and objects are mostly administered to assess the abilities of pre-school children. HOTIT is designed to determine the speed with which participants can access the names of the numbers repeated in random sequences on a sheet.

In subtest of Rapid Digit Naming, numbers (2, 4, 6, 7 and 9) were presented in five rows of ten, making 50 items in total. From one line to the next, the order of the five numbers varied. Before the test trial started, the child was given two lines of the same numbers printed on a separate sheet. This way, it was ensured that the child

knew the target items and was capable of naming the stimuli. Then, the child was asked to name items as quickly as possible and without making any errors, beginning in the upper left corner of the sheet and ending in the lower right. The total time from the participant's beginning to name the first item to naming the last was recorded via a chronometer. The score for this task was the time (number of seconds) spent to name 50 items.

4.3.3 The Turkish version of WISC-R for children – revised

Digit Span

Phonological memory was measured by digit span (forward) subtest of WISC-R which is adapted to the Turkish language by Savaşır and Şahin (1995). The test of WISC-R includes 2 subtests: the forward and backward digit span. The present study made use of forward digit span subtest. In this task, the child was verbally presented with sequences of numbers increasing in length and he or she was asked to repeat these sequences back. There were two series of two, three, four, five, six, seven and eight digits on this subtest. Testing was discontinued when both series of given digits were repeated incorrectly. The maximum score was 16 for this test. Scoring was simply the number of sequences correctly repeated.

4.3.4 Vocabulary knowledge

The Turkish version of Woodcock Johnson Picture Vocabulary subtest was developed by Ercetin, Haznedar, and Babur in order to assess children's vocabulary knowledge. In this task, the students were required to name realistic drawings of both familiar and unfamiliar pictured objects. Since this specific task tapped into children's ability to produce correct names for the pictured objects, it assesses the

ability to produce the name of the written objects, which is an indication of expressive vocabulary. The test consisted of 44 items which were ordered by increasing difficulty (from familiar to less familiar objects). The child was presented with a picture book displaying picture of the objects. He or she had to respond to the question 'What is that?'. In the practice trial, to familiarize the participants with the task, they were shown a picture of a 'car'and were asked to point it and name the object. Testing was continued until the child failed 6 items in a row. The minimum score was 0 and the maximum score was 44.

4.3.5 Turkish test of word reading efficiency (KOBIT: Kelime okuma bilgisi testi)

The Turkish Test of Word Reading Efficiency (KOBIT: Kelime Okuma Bilgisi Testi) was developed by Babür et al. (2013) with the purpose of assessing word reading abilities of primary level students ranging in age from 6 to 11 years. The reliability and validity studies have evidenced that it is a reliable and valid measure of fluency and accuracy of word-reading skills in Turkish. It was adapted from Wagner, Torgesen and Rashotte's (1999) Test of Word Reading Efficiency (TOWRE) which is standardized and developed in the USA and administered to individuals aged 6-24. TOWRE has been widely utilized for different purposes, such as diagnostic assessments of children with reading difficulties and other handicapping conditions and monitoring the growth of early reading ability process in children. Similar to the English TOWRE, KOBIT consists of two subtests as Sight-Word Efficiency (SWE) and Phonemic Decoding Efficiency (PDE). Subtests includes a list of words developed considering the phonological, morphological and orthographic structure of Turkish language. The current study employed the both of

subtest Sight-Word Efficiency (SWE) and Phonemic Decoding Efficiency (PDE) to measure reading abilities in Turkish.

Sight-word efficiency (SWE)

This subtest is a measure of an individual's ability to read printed single words automatically without resorting to phonological encoding. This test was employed to measure the real word reading ability (WRD) in Turkish. It assesses the number of real words printed in vertical lists that the children can accurately identify within 60 seconds. The words on the list are chosen based on their frequency in Turkish language and the number of syllables they contain. Similar to the original TOWRE, the word-reading list increase in difficulty of the phonological, morphological and orthographic structure. The word list starts with a frequent and monosyllabic word, *bir*, and ends with *gerçekleştirilmemiş* which is an infrequent and multisyllabic word. An 8-word practice list was presented first to make the participant familiar with the test procedures. Then, he or she was asked to read as many words as possible from the list within 60 seconds. The number of words read correctly within 60 seconds time limit determined the score for this subtest.

Phonemic decoding efficiency (PDE)

The Phonemic Decoding Efficiency (PDE) subtest of KOBIT was used to assess students' ability to decode non-words in Turkish. The test consists of 63 pseudo words that comply with the Turkish orthographic rules. As in the subtest of SWE, the items on the list are initially easy to decode like one or two syllable non-words (e.g., *ge, misi*), and they subsequently become orthographically longer, multisyllabic non-words (e.g., *tümsütülmüş, fundakatçıyalar*). Here too, the children were given practice items initially to make sure that they understood the procedure. Children read aloud as many words as possible within 60 seconds. The score for this subtest

was the total number of words read accurately in the given time. This test was employed to measure the pseudo-word reading ability (PWD) in Turkish.

Figure 2 below displays an overview of the instruments used for the present study.

4.4 Procedure

Data for this study were collected in the spring semester of 2016-2017 academic year. The entire data collection took place only in March due to time constraints. The researcher visited the schools on a daily basis and completed the data collection process within 15 days. Before the data collection began, approval from school administrations and permission from parents and teachers in each school were received through consent forms.

Children were tested on an individual basis by the researcher in a quiet study room or in the school library. All students received the same instructions in order to keep the tests identical for all the respondents. In a few cases, the researcher switched to the participant's dominant language (Kurdish) while giving the instruction about the task to ensure a complete understanding of the requirements from the participant. Due to time restrictions and to prevent loss of participants (missing values) over the course of data collection, each student was assessed in a single session of approximately 30-40 min total duration. However, the researcher administered a long test followed by a short test. Also, the participant was given a break when he or she showed signs of fatigue. The sessions began with informal conversation to enable the participant feel comfortable. The tests within the battery and subtests were administered in a random order to minimize the influence of mental or physical fatigue on the participants' performance.

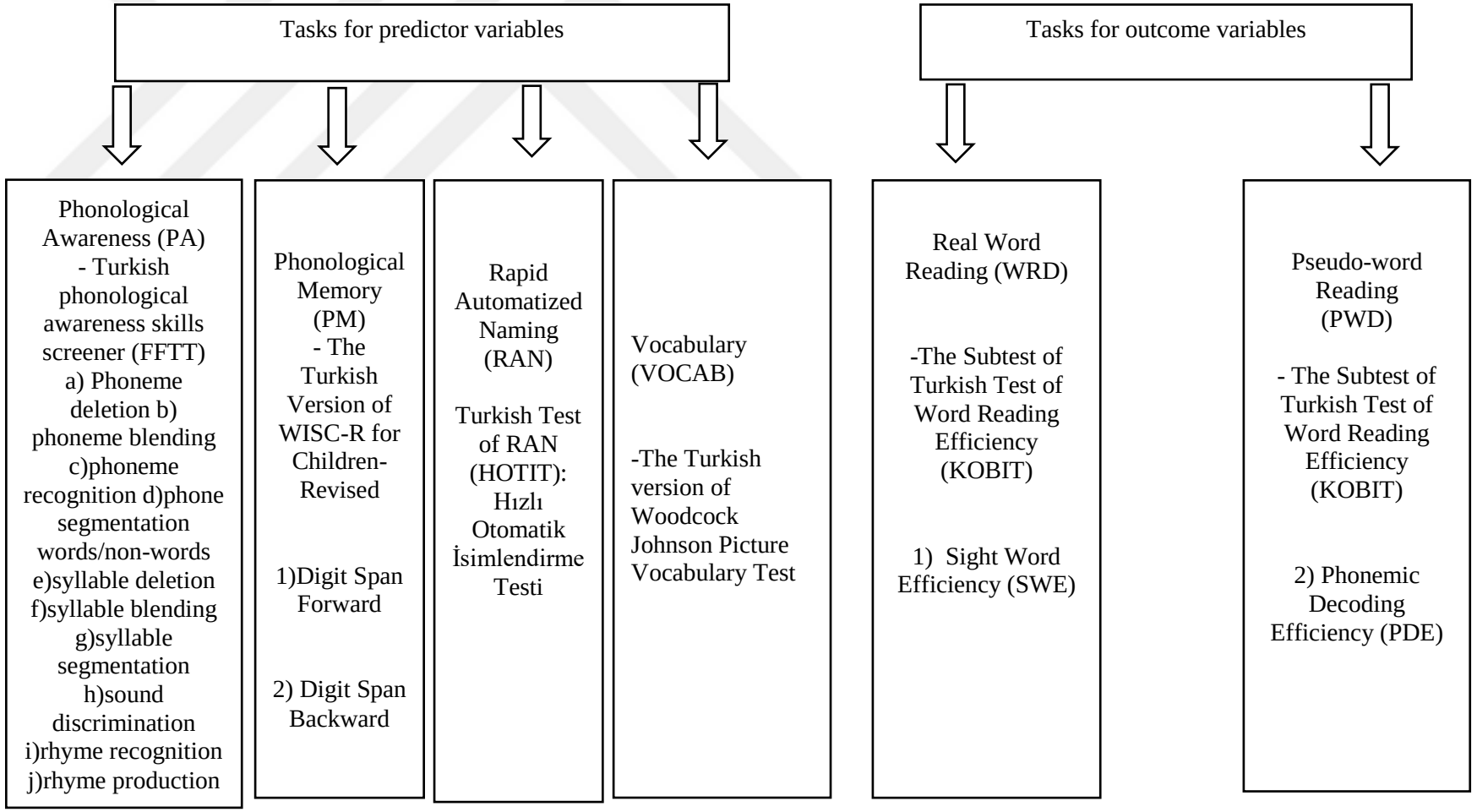


Figure 2. Instruments used in the study

4.5 Data analysis

As noted earlier, participants' PA, PM, RAN, and vocabulary skills were assessed through a battery of standardized measures of FFTT, WISC-R Digit Span, HOTIT and vocabulary knowledge test, respectively. To asses their reading skills, two subtests of KOBIT were administered.

The data of the present study were analyzed quantitatively. All statistical analyses were performed with SPSS (Statistical Package for Social Science) for Windows 22.0. For preliminary data analyses, the data of both grade-levels were checked in normality of the distribution for each dependent variable, WRD and PWD. Shapiro-Wilk test revealed that RAN, WRD and PWD scores of 1st graders did not meet the normality assumption. In other words, the scores of these variables were not within the acceptable range of normality which is determined by the values of asymmetry and kurtosis ranged between -2 and +2 (George & Mallery, 2005). Upon determining the outliers by checking Inter-Quartile Range Boxplots, their values were simply transformed into the next highest or lowest (non-outlier) score. Following this procedure, the influence of the outliers were reduced and positively skewed distribution of these specific variables were converted into a normal distribution.

In order to address first research question which explores whether there is a significant difference between first graders and second graders with regard to PA, RAN, PM, vocabulary, word reading and pseudo-word reading performance, Independent Samples T-tests were employed. As for second research question addressing the intercorrelations between PA skills, RAN, PM, vocabulary performances, word reading and pseudo-word reading scores, Pearson product-moment correlations were conducted. Finally, multiple and hierarchical regression

analyses were administered in order to determine the contribution of PA, RAN, PM, and vocabulary to word reading and pseudo-word reading skills of bilingual readers.

CHAPTER 5

RESULTS

This chapter provides the results of the statistical analyses in accordance with the research questions. In relation to first question, results related to descriptive statistics and independent samples t-test were covered. With regard to the second question, the results of Pearson product-moment correlations were presented. As for the last two questions, results of multiple and hierarchical regression analyses were provided.

Research Question 1: Is there a significant difference between Grade 1 and 2 Kurdish-Turkish bilingual children in terms of their PA skills, RAN performance, PM, vocabulary, WRD and PWD abilities in Turkish?

Table 6 shows the means of both reading related components as well as WRD and PWD abilities of Grade 1 and 2. Descriptive statistics revealed that second graders outperformed first graders in all cognitive and linguistic tasks as well as in both reading measures. For overall scores of PA performance of Grade 1 and 2, second graders performed better than first graders. As for RAN scores, second graders outperformed first grade students. Regarding PM scores, second graders scored higher than first graders. With regard to their vocabulary scores, second graders outperformed first graders. When it comes to WRD abilities, second graders' scores were higher than first graders' and finally, second graders also outperformed first graders in PWD test.

Table 6. Descriptive Statistics for Grade 1 and Grade 2

Variables	First Grade (n=40)		Second Grade (n=41)		T
	Mean	SD	Mean	SD	
PA	51.80	20.30	78.41	18.73	-6.13**
RAN	61.88	23.41	38.71	9.78	5.84**
PM	6.83	2.36	8.59	2.22	-3.45**
VOCAB	12.62	4.03	14.29	4.09	-1.85
WRD	4.62	4.57	27.34	11.06	-12.02**
PWD	4.170	4.09	18.95	7.96	-10.46**

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, WRD = Word Reading, PWD = Pseudo-Word Reading. *$p < .05$, **$p < .01$

In order to testify whether the observed performances in PA, RAN, PM, vocabulary, WRD, and PWD significantly differ across grade levels, Independent Samples T-tests were conducted for each variable separately (see Table 6 for details). Regarding PA performances, there was a significant difference in the mean scores for first grade and second grade. Similarly, the difference between the mean scores of first and second graders had in RAN was significant, showing that second graders were faster in processing visual stimuli than first graders. As for PM performance, there was also a significant difference in the mean scores of first and second graders. When it comes to vocabulary performances, there was not a significant difference between first and second graders. However, the WRD mean scores for first and second graders showed significant difference. Similarly, the PWD mean scores for first and second graders showed significant difference.

Research Question 2: What is the relationship of PA, RAN, PM, and vocabulary with WRD and PWD performance in Turkish? Does the pattern of the relationships among the measures differ across Grade 1 and 2?

In order to see whether PA, RAN, PM, and vocabulary correlated with WRD and PWD reading skills within each grade level, Pearson product-moment correlations

were separately carried out for each grade level to determine the relationships between variables. Table 7 and Table 8 present the intercorrelations among all measures for first and second graders, respectively. As can be seen from Table 7 and 8, the pattern of relationship between variables were quite different across grade levels. There were some differences between two grades with respect to the correlations between the predictors (i.e., PA, RAN, PM, vocabulary) and reading measures, as well as in the correlations among the predictors themselves.

As Table 7 illustrates, in Grade 1, the variables which significantly associated with WRD ability were PA, RAN, and PM. Regarding WRD as the dependent variable, PA had the strongest correlation while PM had the weakest correlation. There was no significant correlation between WRD ability and vocabulary at this grade level.

Regarding the PWD ability as the dependent variable, PA had the strongest correlation whereas vocabulary had the weakest correlation. As it was mentioned before, vocabulary did not show any significant correlation with WRD reading ability although it was found to have a significant correlation with PWD reading ability at this grade level. PA and RAN was found to have the strongest significant correlations with both WRD and PWD reading measures, which was assumed before. Among the predictors, the strongest correlation was between PA and PM ($r = .724$, $p < .01$).

Table 7. Intercorrelations among the Variables at Grade 1

Variables	1.	2.	3.	4.	5.	6.
PA	-					
RAN	-.521**	-				
PM	.724**	-.471**	-			
VOCAB	.559**	-.201	.569**	-		
WRD	.625**	-.550**	.399*	.231	-	
PWD	.659**	-.510**	.486**	.323*	.890**	-

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, WRD = Word Reading, PWD = Pseudo-Word Reading. *$p < .05$, **$p < .01$

It is apparent from Table 8 that a different picture emerged with the second graders. All the predictor variables were revealed to be significantly correlating with WRD reading ability. Regarding WRD as the dependent variable, PM had the strongest correlation whereas vocabulary had the weakest correlation. Similarly, all the reading-related components were significantly associated with the PWD reading ability. However, PA was found to be the highest correlate of this particular reading ability and vocabulary the weakest correlate.

The most marked observation to emerge from the relationships among the predictors was that the strong correlation between PA and RAN in the first grade was found to disappear in the second grade, revealing no significant correlation. It is additionally fundamental to note that at this grade level, the strongest correlation was between PA and PM ($r = .652$, $p < .05$), which was the same with the first graders.

Table 8. Intercorrelations among the Variables at Grade 2

Variables	1.	2.	3.	4.	5.	6.
PA	-					
RAN	-.269	-				
PM	.652**	-.329*	-			
VOCAB	.404**	.003	.324*	-		
WRD	.624**	-.491**	.663**	.402**	-	
PWD	.563**	-.396*	.550**	.376*	.888**	-

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB =Vocabulary, WRD = Word Reading, PWD = Pseudo-Word Reading. *$p < .05$, **$p < .01$

Research Question 3: Do PA, RAN, PM, and vocabulary make significant contributions to real word reading (WRD) performance in Kurdish-Turkish bilingual children in Grade 1 and 2?

The current study has sought to examine the role that PA, RAN, PM and vocabulary play in predicting real word (WRD) in Turkish for bilingual students across grade levels. To identify variables that uniquely contributes to real word reading, multiple regression and then a set of hierarchical analyses were carried out for each grade. Multiple regression is generally used for prediction or explanation. Regardless of being carried out for predictive or explanatory purposes, the general interest in using multiple regression is to compare the IVs in order to find out the extent to which each independent variable contributes to successful predictions or valid explanations (Huck, 2012). Multiple regression analyses were conducted as there were several IVs in the current study and it enabled to find out which IVs were useful in predicting a DV. To obtain more information about the relationship between several IVs and the DV, multiple regression analyses were employed first. Then, hierarchical regression analyses were performed to determine the unique contributions of IVs to the DV.

These variables were entered into the hierarchical regression with regard to their potential relation with the DV as suggested by the theory and past reearch. Before running regression analyses, regression related assumptions such as linearity, collinearity scores, Mahalanobis distance, and homoscedasticity were checked out in the data set and they were all within the accepted limits (Coakes, 2005).

First, a set of multiple regression analyses was performed to investigate whether PA, RAN, PM, and VOCAB could significantly predict first graders' WRD abilities. A significant regression equation was found. The individual predictors were investigated further and displayed that PA and RAN were significant predictors in the model. Table 9 illustrates the results of the multiple regression analysis conducted with first graders for WRD.

Table 9. Summary of Multiple Regression for Real-Word Reading at Grade 1

Dependent Variable	Independent Variable	ß	t	p	F	R^2
		4.484	1.359	.183	8.072**	.420
WRD	PA	.139	3.177	.003**		
	RAN	-.062	-2.142	.039*		
	PM	-.273	-.747	.460		
	VOCAB	-.110	-.620	.540		

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, WRD = Word Reading, *p < .05, **p < .01

On the other hand, PM and vocabulary did not contribute to the multiple regression model. Based on this result, PA and RAN were considered significant predictors of word reading ability and were thus retained for the following hierarchical regression analysis. The nonsignificant variables, PM and vocabulary were removed from the model and a hierarchical multiple regression analysis was conducted in order to reveal which of the two variable, PA or RAN, would provide the best prediction of word reading performance. The decision regarding the order of

the entry in the hierarchical regression was made based on theory and past research. As such, PA was entered into the model in step 1 and RAN was added in step 2.

At step 1 of the analysis, PA was entered into the regression equation and was significantly related to word reading ability. It indicated that approximately 37.4% of the variance in the WRD could be accounted for by PA abilities of children.

At step 2 of the analysis, RAN was entered the equation to check whether it significantly contributed to WRD. It was revealed that the two predictors had a statistically significant impact on the model's ability to predict WRD and together explained 43% variance of WRD ability. Therefore, PA still accounted for a statistically significant amount of variance to WRD as RAN only contributed 05.6% of the remaining variance. These results indicated that PA accounted for a unique amount of variance in WRD abilities of first grade bilinguals. Table 10 presents the summary of the hierarchical regression analysis.

Table 10. Summary of Hierarchical Regression for Real-Word Reading at Grade 1

Dependent Variable	Independent Variable	ß	t	p	F	R^2	ΔR^2
WRD (Step 1)		-2.669	-1.682	.101	24.297**	.374	-
	PA	.141	4.929	.000**			
WRD (Step 2)		2.946	.987	.330	15.731**	.430	.056
	PA	.105	3.275	.002**			
	RAN	-.060	-2.182	.036*			

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, WRD = Word Reading, *$p < .05$; **$p < .01$

Similarly, as is shown in Table 11, a set of multiple regression analysis was performed to investigate whether PA, RAN, PM, and vocabulary could significantly predict second graders' WRD abilities. A significant regression equation was found.

The individual predictors were investigated further and displayed that RAN and PM were significant predictors in the model.

Table 11. Summary of Multiple Regression for Real-Word Reading at Grade 2

Dependent Variable	Independent Variable	ß	t	p	F	R^2
		7.994	.939	.354	13.990**	.565
WRD	PA	.141	1.659	.106		
	RAN	-.357	-2.818	.008**		
	PM	1.694	2.407	.021*		
	VOCAB	.530	1.695	.099		

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, WRD = Word Reading, *$p < .05$, **$p < .01$

PA and vocabulary did not show a statistically significant impact on the model's ability to predict WRD ability. Based on these results, PM and RAN were considered significant variables that might have contributed to bilingual second graders' performance on WRD task and were thus used for the following hierarchical regression analysis. The decision regarding the order of the entry in the hierarchical regression was made according to the theory and previous research. As such, RAN was entered into the model in step 1 and PM was added in step 2.

As is shown in Table 12, at step 1 of the analyses, RAN was entered into the regression equation and was significantly related to WRD ability. It indicated that approximately 22.2% of the variance in the WRD could be accounted for by RAN abilities of children.

At step 2 of the analyses, PM was entered the equation to check whether it significantly contributed to WRD. It was revealed that the two predictors had a statistically significant impact on the model's ability to predict WRD and together explained 49.8% variance of WRD ability. Therefore, RAN accounted for 22.2% of

variance to WRD whereas PM accounted for 27.6% of variance to WRD abilities of second grade bilinguals. Table 12 displays a summary of hierarchical analysis conducted with RAN and PM variables.

Table 12. Summary of Hierarchical Regression for Real-Word Reading at Grade 2

Dependent Variable	Independent Variable	ß	t	p	F	R^2
WRD (Step 1)		48.835	7.761	.000	12.394**	.222
	RAN	-.555	-3.520	.001**		
WRD (Step 2)		16.729	1.981	.055	20.871**	.498
	RAN	-.346	-2.583	.014*		
	PM	2.797	4.745	.000*		

Note. RAN = Rapid Automatized Naming, PM = Phonological Memory, WRD = Word Reading, *$p < .05$, **$p < .01$

Research Question 4: Do PA, RAN, PM, and vocabulary make significant contributions to pseudo-word reading (PWD) performance in Kurdish-Turkish bilingual children in Grade 1 and 2?

To identify the best predictor variable of PWD reading ability of bilingual first graders, a set of multiple regression analysis was conducted, as illustrated in Table 13. The model was revealed to be significant. The multiple regression model with all four predictors, PA, RAN, PM, and vocabulary, accounted for 41.3% of the total variance in PWD performance of first graders. RAN, PM, and vocabulary did not significantly contribute to the model's ability to predict PWD whereas only PA had significant positive regression weight. In line with the existing literature, PA was the the strongest predictor of PWD ability, explaining 41.3% of the total variance.

Table 13. Summary of Multiple Regression Analysis for Pseudo-Word Reading at Grade 1

Dependent Variable	Independent Variable	ß	t	p	F	R^2
		1.284	.433	.668	7.857**	0.413
PWD	PA	.115	2.918	.006**		
	RAN	-.040	-1.534	.134		
	PM	-.027	-.082	.935		
	VOCAB	-.033	-.209	.836		

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, PWD = Pseudo-Word Reading, *p < .05, **p < .01

To reveal the best predictor variable of PWD reading ability of bilingual second graders, a set of multiple regression analysis was conducted. In identifying the best predictor of PWD, four variables were entered in the multiple regression analysis. As can be seen from Table 14, the result indicated a significant regression equation. The multiple regression model with all four predictors, PA, RAN, PM, and vocabulary, accounted for 38.8% of the total variance in PWD performances of second graders. None of the variables were found to have an impact on PWD scores of bilingual second graders.

Table 14. Summary of Multiple Regression Analysis for Pseudo-Word Reading at Grade 2

Dependent Variable	Independent Variable	ß	t	p	F	R^2
		5.345	.735	.467	7.329**	.388
PWD	PA	.113	1.563	.127		
	RAN	-.202	-1.867	.070		
	PM	.833	1.384	.175		
	VOCAB	.377	1.412	.166		

Note. PA = Phonological Awareness, RAN = Rapid Automatized Naming, PM = Phonological Memory, VOCAB = Vocabulary, PWD = Pseudo-Word Reading, *p < .05, **p < .01

Taken as a whole, second graders significantly performed better at all of the tasks compared to first graders with the exception of vocabulary. Surprisingly, there was not a significant difference between two grade levels with regard to their vocabulary knowledge. Hence the related research hypothesis was partially confirmed. With respect to the relationships between reading-related components and reading ability measures, PA, followed by RAN seemed to have the strongest correlation with both real word and pseudo-word reading ability at Grade 1 while at Grade 2, the strongest correlate of real word reading ability was PM, followed by PA and the strongest correlate of pseudo-word reading ability was PA, followed by PM. As predicted, PA had high correlations with both reading measures at first grade whereas, the strong correlations between PM and WRD as well as PA and PWD at Grade 2 was unexpected. Thus, the relevant hypothesis is partially supported. Regarding the predictive power of variables, PA emerged as the best predictor of dependent measures assessing reading ability at Grade 1. PM and RAN was found to be significant contributors to WRD abilities at Grade 2. However, none of the variables were found to have an impact on PWD scores of bilingual second graders.

CHAPTER 6

DISCUSSION

In this final chapter, a discussion of the research findings with reference to relevant literature is presented. Based on the findings, implications for teaching literacy to bilingual students in Turkish schools are provided. Finally, the limitations of the current study are acknowledged, and suggestions for future directions are given.

6.1. Discussion

6.1.1. Reading abilities and predictors across grade levels

One of the purposes of this present study is to examine the development of reading abilities at word-level and predictors of this ability among bilingual students learning to read in their L2 Turkish at Grade 1 and 2. Comparisons between two grade levels revealed that the second graders significantly outperformed the first graders with respect to word-level reading abilities measured by word and pseudo-word reading fluency tasks. As for the word-level reading predictors, the second graders were revealed to demonstrate superiority in PA, RAN, and PM skills compared to first graders. However, second graders did not perform significantly better than the first graders in the test of vocabulary. Hence, this result partially supported our hypothesis for mean differences across grade levels in the study variables.

As hypothesized, there were grade level differences in PA skills. Cross-linguistic studies indicated that the speakers of diverse languages develop PA skills in different rates because of certain phonological characteristics of oral and written languages (Goswami, 2005; Durgunoğlu & Öney, 1999). Children learning to read in a highly transparent orthography like Turkish, tend to attain fairly high levels of

phonological skills at the end of the first grade (Babayiğit & Stainthorp, 2007; Durgunoğlu & Öney, 1999; Öney & Durgunoğlu, 1997). Similar findings were reported in other languages with relatively consistent structures such as Dutch (de Jong & van der Leij, 1999), Greek (Harris & Giannouli, 1999), as well as Scandinavian languages like Swedish and Norwegian (Furnes & Samuelson, 2010). However, the first graders in the present study were more dominant in their first language, Kurdish, as reported by the teachers, and their consistent exposure to the second language started upon formal schooling, so, they lacked of oral language input effect that is reported by previous monolingual studies (Caravolas & Bruck, 1993; Durgunoğlu & Öney, 1999). For instance, in Durgunoğlu and Öney's (1999) study, they found that Turkish children even in kindergarten showed a better level of phonological awareness compared to English counterparts. The authors attributed this to some characteristics of Turkish language such as vowel harmony, simple syllable structure, and, post-inflection system which enabled them to attain very high levels of PA perception. Thus, it is probable that the first graders in our study might not have taken full advantage of these salient features of Turkish language as they had not received as much input as Turkish monolinguals reported in former studies. As second graders became literate in their second language and received more instruction in Turkish than first graders, their PA levels increased and they outperformed first graders.

Important to note, the findings demonstrated no significant difference in vocabulary scores between Grade 1 and Grade 2, which was unexpected. It was argued that bilingual children who acquire literacy in their weak language lag behind their monolingual peers with respect to their oral language skills and they are estimated to need between 2 and 5 years to achieve age norms (Bialystok, 2007b).

Additionally, it is a fact that bilingual children have smaller vocabularies in their both languages (Oller & Eilers, 2002) and attain lower scores on vocabulary tests measured in their second language compared to monolinguals whereas they displayed a growth in their L2 vocabulary knowledge over years (Geva et al., 2000; Jean & Geva, 2009; Verhoeven 2000). This small growth in vocabulary knowledge of participants might cause them to benefit less from important contribution of word frequency during lexical access. Among other predictors, RAN showed a dramatic increase in the second grade. This observed increase in RAN could be attributed to developed automatization skills at this grade level.

Considering the differences between the two groups regarding word-level reading, there exists a developmental trend in reading skills as the child grows up (Ehri, 1995; Frith, 1985; Marsh et al., 1981). Although it is not relevant to research question, it is important to mention that first graders performed almost similar on real word and pseudo-word reading tasks. This finding, while preliminary, may suggest that they used a phonological route, which enabled them to read non-words and real words with consistent grapheme-phoneme correspondences. It complies with dual-route theory by Coltheart (1978) arguing that developmentally phonological access occurs first, and then orthographic access follows. Another important finding about word-level reading is that despite their superiority in both reading skills, second graders' scores on pseudo-word task were more similar to those of first graders. This finding may imply that the dramatic increase in RAN facilitated second graders to adopt orthographic strategies and thus, obtain higher scores at real word reading task than pseudo-word reading. Hence, this finding was in line with the theoretical position referring that RAN is linked to reading through its role in orthographic processing (e.g., Bowers & Wolf, 1993; Manis et al., 1999; Sunseth & Bowers,

2002). Orthographic processing is defined as the ability to form, store and access the orthographic representations of words from mental lexicon without resorting to grapheme-phoneme mappings (Kirby et al., 2010). With the help of this skill, children are able to recognize the very frequent or familiar words rapidly as sight words without using decoding strategies (Ehri, 1992; Ehri, 1997). It taps a similar process to word reading, thus strongly correlates with it.

6.1.2. The interplay between predictors and reading abilities

Mentioning the predictive relationship between naming speed tasks and word reading above, the results of correlational analyses showed that RAN was more strongly associated with word reading than pseudo-word reading ability at both grade levels. This finding is in keeping with those of Kirby et al. (2003) who found that naming speed, RAN was more related to real word reading than phonological decoding measured by a pseudo-word reading task. Manis and colleagues (1999) also reported strong relations between RAN and exception word reading while weaker relationships between RAN and non-word reading skill which emphasizes orthographic knowledge. This finding supports the longstanding notion that RAN involves a similar process with real word reading such as attention, visual recognition, accessing to phonological codes, and finally articulation. It might also be assumed that it complied with dual route theory of Coltheart (1978) who argued that there are two independent routes, lexical (orthographic) and non-lexical (phonological). According to this theory, orthographic route enables reading exception words through repeated exposure whereas phonological route enables the readers to build a phonological representation of regular and non-words by using grapheme-phoneme correspondences. It further argues that orthographic route does

not enable reading of non-words, which must be processed via phonological route. However, there exists an evidence for non-word processed by lexical knowledge in our data, given that RAN highly correlated with non-word reading ability, following PA, at the first grade. Thus, two routes did not act independently, on the contrary, they constantly interacted with each other. This evidence pointed that children used different reading strategies depending on the nature of words, that is, when non-words resembled to frequent real words in terms of consistency and syllable structures, they resorted to orthographic lexical-based route (Ziegler & Goswami, 2005).

With a focus on grade level differences, PA was found to be strongest correlate of both word and pseudo-word reading abilities at Grade 1. It was anticipated in research hypothesis that PA skills would demonstrate high levels of correlations with both reading measures whereas RAN would not correlate with both reading measures as strongly as PA, since this grade level has not developed automatization skills yet. Hence, the results confirmed the stronger associations between PA and reading outcomes in the first grade. The nature of reading changes as grade level increases by revealing that different abilities gain importance in reading performance. The findings may imply that at the onset of literacy instruction, PA is essential even in a highly transparent orthography such as Turkish, and could be a strong correlate of word reading as children still depend on phonological processing in decoding words (Öney & Durgunoğlu, 1997). The results indicated that in the first grade, a stronger link with PA was found than had been reported by other studies of word reading in transparent orthographies (Cossu et al., 1988; Öney & Durgunoğlu, 1997) Similar to the current study, Müller and Brady (2001) reported

significant correlations between PA skills and word reading abilities of first grade Finnish speaking children.

There are distinct stages that children go through before becoming skilled readers. PA being essential at this grade level, we may regard it as corresponding to Ehri's (1995) alphabetic phase in which children make partial connections between spelling and pronunciation by developing an understanding of sound-letter correspondences. By using phonological recoding as a self-teaching mechanism, children learn the associations between letters and their related sounds to create words (Share, 1995). The diminishing correlation of PA with pseudo-word reading ability in the second grade compared to first graders may implicate that they started to move to Ehri's orthographic phase in which readers can reliably connect most of the letters in 'sight words' to their sounds, and as such, they relied less on PA. It is, therefore, not surprising that there were strong correlations between PA and word reading abilities in the first grade and it lost strength for pseudo-word reading ability in the second grade. The results also indicated that another significant correlate of both reading abilities at Grade 1 was RAN. Therefore, instead of explaining children's literacy development only suggested by stage models, it is important to note that children can take different routes to become skilled readers. This routes and strategies are determined by the transparency of language in which a child is acquiring literacy. This high correlation of RAN was expected and is in line with research evidence suggesting that RAN plays an important role in orthographic processing particularly in consistent writing systems and thus, it is significantly associated with reading abilities (Babayiğit & Sainthorp, 2010; de Jong & van der Leij, 1999).

Interestingly, the relation of PM to reading ability increased significantly as the grade level increased, such that, while it correlated weakly to reading abilities at Grade 1, it correlated very strongly to reading abilities at Grade 2. A similar pattern was observed in de Jong and van der Leij's (1999) study in which the increase in the relationship between PM and reading performance from kindergarten to Grade 1 was attributed to children's starting formal schooling and literacy instruction. Research on training studies provided evidence that training children in phonology influences their phonological memory positively (Ellis, 1990). Although the second graders in the present study had their literacy instruction before, they could be regarded as novice readers still learning to read. Thus, it could be assumed that their PM might be influenced by learning to read, to some extent.

In contrast to hypothesis, RAN did not show higher correlations with reading abilities compared to PA skill in the second grade while it remained significantly related to them. This finding revealed that children maintained their awareness of phonological units particularly in reading pseudo-words over years. This may imply that children relied on the application of sound-to-spelling correspondence rules via phonological pathway while reading unfamiliar words, which do not have a lexical entry.

Finally, the most surprising correlation was with the one between PM and PA, which was the strongest among the predictor variables at both Grade 1 (r =.72) and 2 (r =.65). An explanation for this finding could be that the two variables are indeed related to each other as claimed by Wagner and Torgesen (1987). Conceptualizing PM as an aspect of phonological processing along with RAN, they argued that "performance on a measure of phonological awareness was related reliably to performance on a measure phonetic recoding in working memory." (p.

207). In line with this framework, the correlation results indicated that PA and PM were significantly related to each other in the first grade and it persisted in the second grade. McBride-Chang (1995) asserted that participants taking a phonological awareness tasks, among other operations, are demanded to hold the speech segment in memory long enough to work on it; namely, they must remember the stimuli for a while. So, short-term memory is required for this task. PM is, therefore, one of the components of PA tasks. Along the same line, Dufva et al. (2001) reported that PM had an indirect effect on word recognition abilities via PA in Finnish elementary school children since PA tasks requires phonological memory such as retention of material during the completion of sound blending task. Apparently, the components of reading acquisition are interrelated to some extent, however, there is sufficient evidence showing that the basic abilities related to early reading are separate skills which play independent roles.

6.1.3. Predictors of real and pseudo-word reading ability

The aim of the present study is to determine the validity of four crucial underlying skills, PA, RAN, PM, and vocabulary, as predictors of word and pseudo-word reading ability in a bilingual sample learning to read in their second language. There has been an abundant monolingual research evidence to demonstrate these variables as powerful predictors in reading abilities and they have heavily relied on a rather opaque language, English. Therefore, studying the cognitive underpinnings of reading competence in bilingual children acquiring literacy in a highly transparent orthography is of special interest, because it provides important insights into how these predictor variables effects word reading ability beyond research line based mostly on monolinguals and English language.

To begin with real word reading ability, the results of regression analyses validated the research hypothesis, proposing that PA would make a significant contribution to WRD in the first grade whereas its effect would diminish in the second grade. Thus, RAN would explain a large amount of variance in the second grade due to its influence on reading as the grade level increases. However, the results did not confirm the hypothesis regarding the weak influence of PM in predicting word reading abilities since it was revealed that it significantly contributed to word reading abilities along with RAN at Grade 2.

Being a transparent orthography, Turkish is easier to decode and studies reported that PA reached at ceiling levels towards the end of first grade and accounted for less of the variance in learning to read (Babayiğit & Stainthorp, 2007, 2010; Öney & Durgunoğlu, 1997). However, the current study results indicated that PA accounted for 37% and RAN accounted for 5% of variance in real word reading ability of bilingual children in the first grade, suggesting that PA is an important underlying skill that predicts reading performance among beginning Kurdish-Turkish bilinguals more than would have been assumed based on previous findings for Turkish (Babayiğit & Stainthorp, 2007, 2010; Öney & Durgunoğlu, 1997) and for other consistent orthographies such as German (Wimmer & Mayringer, 2002), Greek (Harris & Giannouli, 1999), as well as Swedish and Norwegian (Furnes & Samuelson, 2011). On the other hand, similar to our results, a variety of shallow orthographies have demonstrated that PA is a predictor of reading ability at least over the first year of learning to read (Dutch: de Jong & van der Leij, 1999; Finnish: Müller & Brady, 2001; Norwegian: Furnes & Samuelsson, 2010; Lervåg et al., 2009). Consistent with other studies on regular orthographies, the implication emerging from these findings is that appreciating the phonological composition of

spoken words and how letters map on to sounds of speech is the foundation in learning to read even in highly transparent writing systems.

At the same time, the results also revealed that PA was linked to word reading performance only for a limited time as the influence of PA faded away in the second grade. Instead, RAN and PM explained 49% of total variance in word reading ability while PM contributing a larger portion of 27.6% at this grade level. In accordance with our hypothesis based on the findings of the studies conducted in transparent writing systems, RAN significantly contributed to word reading performances as the grade level increased. For instance, de Jong and van der Leij (1999) investigated the relations between development of PA, PM, and RAN and development of word decoding skills in Dutch speaking children from kindergarten through second grade. They found that PA had an influence on word decoding skills only at the first grade whereas RAN predicted second grade word decoding performance. Supporting evidence also came from a study by Lervåg et al. (2009) reporting that PA skills of Norwegian kindergarten children predicted variations in word-level reading skill through the first grade but not thereafter, while the influence of RAN as a longitudinal predictor was revealed to be consistent in later reading abilities.

Concerning the role of PM, it was assumed that word reading abilities can be predicted by PM very weakly. The results did not confirm the hypothesis as PM had a significant impact on grade 2 word reading ability along with RAN. Given that consistent structure of Turkish orthography enables the children to learn to decode words at the very early phases of literacy instruction, the effect of PM on the word reading ability could stem from the decrement of PA in the second grade and leaving room for PM. Phonological memory, can be defined as the ability to hold verbal,

familiar or unfamiliar information which is coded in a sound-based representational system (Baddeley, 1982). Naming it as phonetic recoding to maintain information in working memory, Wagner and Torgesen (1987) regarded PM as a subcomponent of phonological processing along with phonological awareness and phonological recoding in lexical access (RAN). It may, therefore, display strong correlations with PA as shown by correlation analysis of the current study. The results of L1 studies regarding the role of PM in word reading are somewhat contradictory. Although few studies have focused merely on PM, they have reported the contribution of PM to word reading via its relation with PA (Dufva et al., 2001) or as a weak predictor of reading ability (de Jong & van der Leij, 1999; Kirby et al., 2003). Conducted in the same language and the same reading measurement as this study's, Babayiğit and Stainthorp (2007) indicated that preschool PM had a strong predictive influence on reading speed over years. They speculated that PM may play an essential role in reading development in agglutinative languages like Turkish which is characterized by long words with a string of suffixes. The findings of present study are also in keeping with those of Dufva et al. (2001) who also reported that preschool PM had an indirect impact on word recognition at Grade 1, whereas first grade PM had a direct effect on grade 2 word recognition abilities of Finnish children. Although aforementioned studies used different measurements for word reading abilities, it can be speculated that children learning to read in morphologically rich languages like Turkish and Finnish may rely more on memory skills in the early literacy development. Lastly, some of L2 studies yielded evidence that PM measured in L1 was a reliable predictor of both L1 and L2 word reading or pseudo-word reading abilities (Geva & Siegel, 2000; Gholomain & Geva, 1999).

As for pseudo-word reading ability, multiple regression analysis suggested that PA was the only significant predictor of this reading skill at Grade 1. This finding may lend support to dual route theory (Coltheart, 1978) arguing that pseudo-words are processed via phonological route. Additionally, based on the proportion of variance explained by PA skill in both reading variables, it could be argued that children learning to read in highly regular orthographies like Turkish, prefer non-lexical route to lexical route especially at the very initial stages of reading acquisition (Humphreys & Evett, 1985). Indeed, Gholomain and Geva (1999) showed that English-Persian bilinguals could read unfamiliar Persian words as accurate as they decode English words although Persian was their second language and they were less proficient in this language. The authors argue that the regular orthography of Persian enabled bilingual children to favor phonological route to lexical retrieval and thus, they rapidly gained accurate decoding skills.

Contrary to the hypothesis, vocabulary did not play a role in predicting word reading abilities in any of the grade levels. An explanation for this could be the measures of reading ability used and grade-level tested in the current study. In other words, vocabulary knowledge especially in the second language may contribute to later reading skills such as reading comprehension as children proceed to higher grade levels (Durgunoğlu et al. 1993; Muter & Diethelm, 2001). Thus, inclusion of a reading comprehension measure and a late elementary grade-level would indicate differences among the children in terms of their vocabulary knowledge. This assumption is in accord with the findings of previous L1 and L2 studies. For example, Protopapas et al. (2007) focused on the relations between vocabulary, word reading and reading comprehension performance of Greek children in the second through fourth grades. They found that the unique contribution of word-level reading

to reading comprehension became insignificant after vocabulary measures were entered in hierarchical regression analyses, especially for higher grades. In agreement with our assumption, Muter et al. (2004) did not find any associations between vocabulary knowledge and word recognition abilities of very young readers at the initial stages of formal schooling. The authors suggested that phonological processing skills plays a greater role in the early stages of reading development, whereas, vocabulary skills gain more importance as the grade level increases.

6.2. Conclusion

Overall, the main finding of the current study is that the relationship between individual differences in the development of underlying cognitive-linguistic skills and basic reading performance appeared to be dependent on the grade-levels. In other words, the findings highlighted the importance of phonological awareness skill for the first grade bilingual reading achievement while this impact faded away and gave room for rapid naming and phonological memory in the second grade. Phonological awareness, PA which is defined as the sensitivity to and the ability to manipulate sound structure of oral language (Gillon, 2007; Wagner et al., 1997) appeared to be significantly and strongly related to word-level reading abilities measured towards the end of first grade despite the findings of the studies revealing that PA reached at ceiling levels towards the end of first grade and accounted for less of the variance in learning to read in highly consistent orthography of Turkish (Babayiğit & Stainthorp, 2007, 2010; Öney & Durgunoğlu, 1997). The conclusion drawn from this situation can be that the Kurdish-Turkish bilingual students at Grade 1 developed a phonological reading strategy as indexed by PA performances. The finding that PA tends to lose its strength as the grade level increases is reminiscent of previous

studies indicating that PA was linked to word reading performance only for a limited time in transparent orthographies. The time-limited effects of PA in the current study may be attributed to both consistency of Turkish orthography and phonics teaching method used for teaching literacy in Turkey since it highly emphasizes phonological decoding skills. On the other hand, RAN and PM were the strongest correlate and predictor of word reading abilities in the second grade. Such dominance for RAN suggests that children engaged in reading words by sight as marked by their RAN performances as they become more automatized and rapid in reading. The unexpected relationship between PM and word reading speed at Grade 2 may be attributed to the characteristics of Turkish language having a rich morphological structure (Babayiğit & Stainthorp, 2007) however this speculation needs to be evaluated cautiously due to the small number of comparable studies.

6.3. Pedagogical implications of the study

The findings of the present study indicated thought provoking insights into the understanding of reading processes of Kurdish-Turkish bilingual children learning to read in a transparent orthography, Turkish. A robust body of research has indicated that underlying cognitive and linguistic components affect development of early reading skills in distinctive ways with regard to orthographic variations among languages. Although the same predictors are relevant for monolingual and bilingual reading development, it is also important to understand to what extent these predictors affect basic reading skills in a bilingual sample. In contrast to the previous findings of Turkish studies with monolingual samples, the strong reliance on phonological awareness in first grade indicates that bilingual children develop unique paths to literacy. Thus, using a uniform reading instruction for both monolingual and

bilingual readers may not be necessarily best for them. As Frost (2012) points out "only models that are tuned, one way or another, to the full linguistic environment of the reader can offer a viable approach to modeling reading" (p. 264). The study finding also documented that bilingual children's rapid naming performances were strongly related to their reading skills at Grade 2. Therefore, one of the key implications of this study is that reading instruction in transparent orthographies should focus on teaching phonological skills in the first year, and then provide the words as whole meaningful units in the later stages of literacy instruction. Although its long-term effects are small, presenting basics in phonological awareness at the beginning will enable the bilingual children to become familiar with the sound, meaning and written forms as well as distinctive aspects of their second language which they have not mastered yet.

6.4. Limitations of the study

A number of caveats need to be noted regarding the present study to help future research. First, a cross-sectional design was adopted which limited the researcher to observe reading components and reading development at two different grade-levels concurrently. Therefore, a longitudinal design would have provided more profound insights into the contribution of these cognitive-linguistic factors to the development of reading skills, and as such, would have presented a broader generalizability.

A second notable limitation concerns the sample characteristics and size. Findings provided by the current research are based on a small sample of bilingual Kurdish-Turkish children dwelling in a geographically remote area of Turkey. Thus, it may not be a representative for monolingual Turkish students, native speakers of other languages or even Kurdish-Turkish bilinguals living in urban areas learning to

read in Turkish. Similar findings may not be found with children in other minority groups as each one of them have different linguistic and literacy backgrounds.

Last but not least, Kurdish is only a spoken language in Turkey, which made hard to develop assessment tools in the first language. Therefore, the focus of the present study was only on L2 knowledge in explaining literacy outcomes for young readers because there were not any standardized parallel tests in Kurdish language. As such, it does not provide evidence for a cross-linguistic transfer of some L1skills like phonological awareness on their L2 reading skills. Although they did not receive instruction in their first language, they might have transferred awareness of sounds in spoken Kurdish language to their L2 literacy skills to some extent. However, such investigations are beyond the scope of the present study.

6.5. Suggestions for further research

As there is a lack of studies conducted on literacy acquisition among Kurdish-Turkish bilingual children, further research on this specific sample is needed to extend our understanding of bilingual literacy development. First, a longitudinal study with a similar sample should be conducted in order to gain a more comprehensive picture of developmental patterns in Turkish reading acquisition. Second, it is suggested to replicate and confirm the reported study findings with a larger sample size, particularly with Kurdish-Turkish bilinguals living in urban areas. Third, although participants did not receive reading instruction in their first language, incorporating some measures of basic skills acquired in the first language such as L1 PA skills could be informative about the cross-linguistic transfer effects. Given that both languages in question are similar with respect to their transparency and phonological structure, it is expected that there is a transfer of skills from Kurdish to

Turkish, which could have an impact on L2 reading achievement. In addition to some L1 measures, including measure of L2 reading comprehension with higher grade levels could be very insightful in order to see the impact of vocabulary knowledge as well as other component processes on reading development. Finally, it would be worthwhile to include a Turkish monolingual group in the future study to compare both groups in terms of their differential performances on both component and reading skills. It would also give chance to examine the effects of bilingualism on learning to read in their second language by comparing them to their monolingual peers.

APPENDIX A

ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
İnsan Araştırmaları Kurumsal Değerlendirme Alt Kurulu

Sayı: 2017-49

21 Haziran 2017

Mahsume Öz
Yabancı Diller Eğitimi

Sayın Araştırmacı,

"Türkçe - Kürtçe Çift Dilli Çocukların Ses Farkındalık Becerileri " başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2017/39 sayılı başvuru İNAREK/SBB Etik Alt Kurulu tarafından 21 Haziran 2017 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Saygılarımızla,

İnsan Araştırmaları Kurumsal Değerlendirme Alt Kurulu

Doç. Dr. Ebru Kaya

Yrd. Doç. Dr. İnci Ayhan

Doç. Dr. Gül Sosay

Doç. Dr. Mehmet Yiğit Gürdal

Yrd. Doç. Dr. Bengü Börkan

APPENDIX B

SAMPLE TEST ITEMS

FFTT

1) Phoneme Deletion

   gez de ama /g/ deme (ez)

   ödev de ama /v/ deme (öde)

   zincir de ama /z/ deme (incir)

2) Phoneme Blending

   /i/ /t/: it

   /b/ /a/ /k/: bak

   /m/ /ı/ /s/ /ı/ /r/: mısır

3) Phoneme Recognition

   at (araba, adam)

   kalem (kuş, köpek)

   boncuk (bebek, baba)

4) Phoneme Segmentation – Words

   et /e/ /t/

   düş /d/ /ü/ /ş/

   çorap /ç/ /o/ /r/ /a/ /p/

5) Phoneme Segmentation – Nonwords

   pa /p/ /a/

   müş /m/ /ü/ /ş/

   lark /l/ /a/ /r/ /k/

6) Syllable Deletion

re-sim (“re” deme)

hız-lı (“lı” deme)

fin-can (“fin” deme)

7) Syllable Blending

ek….mek

so…lu…can

gi…de…bil…miş…ler

8) Syllable Segmentation

sıra (sı-ra)

harika (ha-ri-ka)

kalorifer (ka-lo-ri-fer)

9) Sound Discrimination

muz – muz

çam – cam

var – far

10) Rhyme Recognition

ten: mat, sen?

tuzak: uzak, kumaş?

derin: gelen, serin?

11) Rhyme Production

yat – kat

boş – hoş

para – yara

HOTIT (Sayı)

2 6 9 4 7 4 6 2 9 7

4 2 7 6 9 2 9 7 2 6

WISC-R

1) Digit Span Forward

5 – 9

6 – 1 – 2

9 – 8 – 5 – 2 – 1 – 6 – 3

2) Digit Span Backward

6 – 3

2 – 5 – 9

3 – 6 – 7 – 1 – 9 – 4

KOBIT

1) SWE

bir

yavrucak

çıkageldi

2) PDE

ge

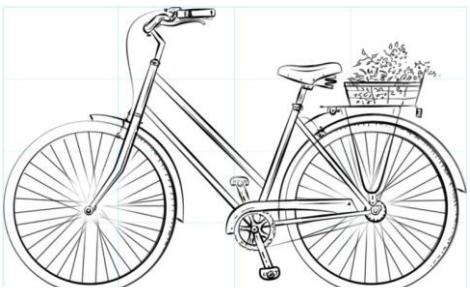
heştün

cülümküzde

VOCABULARY

What is this?

Answer: a bike



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