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Research Article

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When Dyslexia Meets Diglossia: Assessment Using the Spoken Arabic Language in Kindergarten

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Abstract

Research suggests that early identification of developmental dyslexia is important for mitigating the negative effects of dyslexia [1-3]. Children begin to acquire their native language from the first day they are born (and even before). Its assumed that preschooler who has proficient language skills such as vocabulary and syntactical structures in speech, oral expression, auditory processing (recalling a series of nouns in the order they were heard), linear instruction processing (recalling sentences with increasing amounts of information), sentence repetition, vocabulary knowledge, and semantic categories is likely not to encounter difficulties with reading in first grade. These findings may help encourage instruction methods to promote reading among children as early as kindergarten, as well as contribute to the development of diagnostic tools to help kindergarten teachers identify struggling students. This, consequently, would aid in the selection and implementation of early intervention programs to help students cope with difficulties in school.

Keywords: Dyslexia, Standard Arabic, Spoken Arabic, Kindergarten, Early Symptoms

1. Introduction

To date, there has been very little research conducted in Israel with the objective of identifying reading disabilities prior to students beginning primary school. This is so, despite the tremendous importance of early diagnosis and the development of intervention programs designed for the pre-school population. In addition, there is no formal, reliable, relevant system of assessment designed for kindergarten teachers in Israel in general, and for the Arab sector in specific [4].

In the development of human language, the spoken language precedes the development of the standard language, and of course there are interactions and mutual influences between the two languages. The spoken language is based on speaking and listening and consists of vocabulary, sentence structure, style and rhythm depending on different situations. Indeed, it is important to emphasize that a child who is aware of the different forms of use of spoken language may later transfer this to standard language. Moreover, a child who has difficulty using the spoken language may develop difficulties in acquiring the standard language [5,6].

\Therefore, the purpose of this work is to assist parents, kindergarten teachers, teachers and early childhood educators, in the early detection of preschool age children with learning difficulties, based on the assessment of their command of the spoken language. It is likely that the earlier a difficulty is detected, the earlier an intervention can be implemented, increasing the chances of success. If these children are not identified, they will remain untreated, which may lead to reading disability upon entering school and may secondarily lead to impairments in higher learning skills, such as: delay in the acquisition process of proper spelling, a decrease in reading comprehension and impairment of standard expression [5,7].

In light of this reality, there is a need for research to study reading disabilities in kindergarten, through spoken language. The research should also provide a tool to identify and diagnose reading disabilities in kindergarten in the Arab sector, using spoken language.

2. Literature Review

2.1 The Effect of Diglossia on Reading Acquisition

The Arabic language has two forms: the spoken language (Amaya) and the literary language (Alfusha). The Alfusha is different from the Amaya in vocabulary, grammar, syntax, linguistic forms and forms of expression. Arabic is a typical case of diglossia, a sociolinguistic context in which speakers within a single speech community simultaneously use two varieties of a language: one for everyday communication and another for formal interactions and writing. In Arabic, children grow up speaking Spoken Arabic for everyday speech at home and in the neighborhood and Standard Arabic for reading and writing, as well as for formal interaction, as within the classroom [8].

The diglossia in Arabic, causes preschool and school age children to be exposed for the first time to another language unfamiliar to them from everyday life, which makes it more difficult to acquire reading and reading comprehension, compared to similar difficulties in other languages. While dialects of Spoken Arabic are different between different nationality-based Arabic speaking communities, Standard Arabic is largely uniform across the Arabic-speaking world and shares many linguistic characteristics such as phonology, morphology, syntax, and lexicon. At the same time, all Spoken Arabic vernaculars are different from Standard Arabic [9].

Diglossia in Arabic is said to be an old linguistic situation that arose during the spread of Islam, when the Arabic language came into contact with other languages and non-Arabs began to speak Arabic. It refers to the existence and use of two or more types of Arabic in an Arabic-speaking country. Of these types of Arabic, Modern Standard Arabic, or MSA, is considered to be the literary variety, while the other is a colloquial variety. Each type is used for a specific purpose [10]. For example, MSA is used in formal communication, such as in the news media, educational system, religious situations and governmental speech, while colloquial Arabic is the language used in everyday speech.

The majority of studies in this area have dealt with the phonological differences between the two variations of the language and their impact on the acquisition of early reading and writing skills. Findings of these studies point to a deep difficulty in reading acquisition in first grade due to the gap between the phonological systems of the two variations [11]. An additional critical aspect is highlighted in studies that examined diglossia and its effect on reading ability among Arabic-speaking children, since the development of phonological awareness in this group is influenced by the language's diglossia. This is especially the case due to the fact that not all sounds that exist in literary Arabic exist in all the various dialects [12,13].

An additional study by Schiff & Saiegh-Haddad examined the influence of the disparity between the phonology and the lexicon of the Arabic language, and between the spoken and standard written variations and phonological awareness [8]. This study analyzed the effect of the placement of the target phoneme (initial sound vs. final sound). The findings show that there is a specific difficulty in phoneme isolation when the target sound is initial, as opposed to when it is the final sound. In addition, the study found that among kindergarten-aged children, literary words were more closely linked to phonological analysis than words of spoken Arabic or less important words. These findings were interpreted by the researcher as a lack of reading readiness in terms of the phonological structures of the literary words, since this disturbance is a result of the automatic activation of the primary representations of the spoken language for these accepted structures [8].

Conversely, according to Albzour, it is not rational to claim that colloquial language hinders children from acquiring the standard variety, since children are exposed to Standard Arabic in school for almost up to seven hours a day and then on TV for an average of three hours [14]. He further claims that this time is enough to "master" any language [14].

2.2 Reading Disability Diagnosis in Kindergarten

When children reach school-age, they are expected to use their native language with ease. They should be able to use both complex grammatical structures and a large variety of words. This language proficiency is necessary to express complex thoughts, beliefs, and desires, which is essential to participate in learning and social activities in school. In addition, grammatical competence and vocabulary skills have been linked to literacy development and expressive grammar has been found to be important for peer interactions in typically developing kindergarten children [15].

Up to 10% of school-age children struggle to learn to read due to developmental dyslexia The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013, p. 36–37) defines dyslexia1 as a specific learning disorder that impairs reading. Dyslexia is characterized by deficits in accurate and fluent word recognition, poor decoding, and poor spelling abilities. Dyslexia may be associated with additional difficulties in reading comprehension or math reasoning. The long-standing adverse effects of dyslexia are well-documented. Children with dyslexia continue to experience reading problems throughout school-age and beyond, never achieving fluent reading in adolescence and adulthood [16].

Dyslexia is generally defined as the difficulty in reading and writing skills, so it can be detected by educators and families around the age of six to seven years when reading instruction begins. However, dyslexia is a neurobiological difficulty, as soon as an individual begins to speak and express himself/herself, it is possible to identify early by regular monitoring some skills [17].

A large body of research shows that children with dyslexia have impairments in phonological processing the deficits in phonological awareness, i.e., the conscious ability to detect and manipulate speech segments of a language (e.g., syllables, rhymes, and phonemes) are regarded as a robust cross-linguistic marker of dyslexia [18].

One of the early clues of children with dyslexia is low self-perception and low self- confidence. Research has shown that individuals with dyslexia can develop low self-perception and feel inadequate after disturbing experiences especially in early childhood and at school age [19]. Reading today is defined as an integrative process, during which orthographic information is translated into phonological information in order to build new knowledge [20]. Reading is understood as the ability to correctly identify and recall words quickly and automatically in order to reach reading fluency and reading comprehension [21].

Children will acquire the ability to recognize the sound-pattern of spoken words, will recognize the letter of their alphabet, by both shape and name, and will recognize the sounds of the letters. It is not necessary to drill children on each individual phoneme, but rather to assist them in internalizing the basic principle that words are composed of sound units. This is in addition to other skills that contribute to reading development, for example, conversation skills. Teachers should create an environment that invites children to take interest in standard language and to investigate it from a graphic-phonemic standpoint (letter-sound relations) and from a communicative standpoint (relaying messages through writing, documenting spoken language). Research and expansive intervention programs have proven that interventions at the pre-school level can do much to promote these language skills [1,3,11].

In sum, there is great importance in relying on the spoken language as a factor in identifying and diagnosing reading disabilities in children of kindergarten age. Our going assumption is that the earlier that intervention takes place, the more likely it is to succeed to close the gaps, which will otherwise only widen when children reach first grade.

This forces us to look back at that which has been emphasized over the last decade by educators and researchers in the field of reading disabilities: the need to adopt a wide and far-reaching approach to early detection of reading disabilities. This has been dubbed by Stanovich, as “The Matthew Effect” in reading. This is the effect in reading that “the rich get richer and the poor get poorer [22].” In other words, delaying early detection and support of struggling readers will widen the gaps between the strong and weak readers [22].

An additional longitudinal study by McNamara analyzed data of reading achievement scores of 382 students from kindergarten through third grade [23]. The level of phonological awareness of the students was identified, and those who showed low phonological awareness experienced more difficulties in reading when they entered school. These findings also demonstrate the Matthew Effect [23].

a. A report by experts in the field of scholastic diagnosis in the Israeli Ministry of Education’s assessment [4].

b. department showed that the following areas have been left unaddressed:

c. There is no tool for assessing cognitive function of three-year-olds for early identification of students potentially at risk for academic difficulties.

d. There is no tool for qualitative assessment of spoken language development as a predictor of reading readiness (before first and second grade).

e. There is no tool for teachers to use to identify behavioral problems such as ADD/ADHD, behavioral disorders and emotional regulation [4].

A Two-Year Longitudinal Study by Balci (2022) stated as its goal to find early predictors for kindergarten students at risk for dyslexia. Dyslexic students have difficulty remembering information (e.g. songs, rhymes, words, names and names). The study shows that kindergarten students who are at risk for dyslexia have a smaller lexicon than their peers and this situation is reflected in their speech. Another result of the study is that the difficulties experienced in time and spatial skills can be considered a risk of dyslexia. They also have problems with the speed of automatic naming skills and have been found to have problems in activities that require phonological skills [24].

It is important to note that from 2008 until today, valid and reliable diagnostic tools for examining learning disabilities in Arabic have not yet been developed as early as preschool age. Our review until now highlights the importance of early diagnosis of reading difficulties and subsequent early intervention in order to minimize reading difficulties when students enter the first grade [25].

2.3 Linguistic Features of Arabic and Their Influence on Reading Development

Extensive literature shows that linguistic processing and non-linguistic cognitive abilities are compromised in children with dyslexia, suggesting that these skills are closely correlated with reading development. Linguistic processing and non-linguistic cognitive skills appear to share underlying cognitive mechanisms with reading and could be sensitive to reading difficulties .Language-dependent processing tasks emphasize the processing rather than knowledge of linguistic material, whereas language-independent tasks involve minimal linguistic content. Hence, both types of tasks may be less affected by the level of proficiency in a given language, making them suitable for assessing children with diverse linguistic backgrounds [26].

If we focus on the linguistic features of the Arabic language, it will be possible to say, that, Arabic is a Semitic language, written in a consonantal alphabet. Arabic orthography is read and written from right to left. Arabic has a rich morphology which is based largely on a concatenate "root-and-pattern." The roots generally consist of three or four consonants, which give the basic lexical meaning of the word. The pattern (noun-form or verb-form) includes specific grammatical information such as number, tense, person, gender etc [27].

The morphological awareness and its contribution to reading are particularly interesting in the Arabic language, which is characterized by a complex morphological structure and high morphological density. The Arabic language belongs to the inclined

(syntactic) languages, which often merge several morphemes into one word by a linear combination of morphemes or by a barred combination. A linear conjunction, usually characterized by nouns or adjectives, is formed when grammatical morphemes or derivative morphemes are attached to an existing word such as: multiplication inflections: (ball- kura-كرة) + pluralization morpheme) :balls- kurat (كُراتor in possessives (my portfolio – al Haqiba alty li- الحقيبة التي لي + morphed affiliation –ti= Hakibati (حقيبتي) [28].

The findings of a study by Vaknin-Nussbaum, Sabah, and Abbas, demonstrated that the ability to identify the root morpheme and create derivatives have a significant positive relationship with word perception [28]. The higher the morphological awareness scores (biases, root tracing, and derivatives), the better the orthographic identification and phonological decoding. The derivation of the morphological morphology is considered more difficult than the bias, since in the morphology the derivation requires not only the identification of the morphemes but also their manipulation (such as the extraction of the root and its placement in another phonological format). The biases, on the other hand, are characterized by a linear connection that is considered morphologically simpler [28].

Standard Arabic has two versions: a shallow orthography, in which short vowels can be indicated by using diacritical marks, such as dots and dashes that appear below, above or inside the consonantal base of the word; and a deep orthography where the diacritics indicating short vowels are omitted [27].

Shallow orthographies have the advantage of ensuring efficient acquisition of the reading and writing process. Share has termed this feature "decipherability [29]." In Semitic orthographies, vowel signs of all kinds provide phonological information and allow a simple process of grapheme-to-phoneme conversion, which potentially facilitates word recognition by specifying the correct pronunciation of the standard word. For instance, in Arabic pointed orthography, there are unambiguous grapheme-to-phoneme relations: كَتَبَ - kataba (wrote) has one reading option, while the unpointed orthography in which the grapheme- phoneme relation is ambiguous, the unpointed word كتب (ktb) has a number of reading options: كَتِبَ - kotiba (had been written); كَتَبَ - kataba (wrote); كُتُبُ - kotob (books). It is important to note that the diacritical marks not only convey phonological cues that help disambiguate homographs and provide word meaning, but they also have grammatical functions, helping the reader determine whether the word is a verb كَتَبَ - kataba (wrote) or a noun كُتُبُ - kotob (books).

The writing system in Arabic is alphabetical and consists of 29 basic letters graphs, divided into 26 representing the consonants, 3 letters that act as signifiers for diacritical marks are long vowels: (alf), (ا waw), (و yaي), and 3 letters that act as signifiers for diacritical marks are short vowels (x̀ fatha), (x̀ damma), (x̣ kasra), represented by the score above or below the letter. In addition to the graphs, the Arabic language is characterized by a number of orthographic signs, these are: a small circle "sokon" السكون (x̊) above a signal indicating a lack of movement; "Alshade" الشدة(x̌) written above a letter indicating a doubling of the consonant or emphasis. When a "sela" صلة (~) appears above the letter (ا) thousand" it is not pronounced when it appears in the middle or end at the end of a word. In addition, there are grammatical signs called "tanween" التنوين (X X̋ X) which appear above the last letter according to their role in the sentence [30].

The close correspondence between phonemes and graphemes is an important feature of the Arabic orthography and one that is expected to have an impact on the accuracy of single word decoding among Arabic speakers. However, short vowels are not regarded as independent graphemes in written Arabic, but are represented as extra diacritical markings which are only present in religious texts, children's books, textbooks for foreign learners and in otherwise fully vowelized texts. Normal texts read by most older children and adults do not include these diacritical markings. Accordingly, a large number of Arabic words that appear in non-vowelized text are homographic when presented out of context.

This means that the reader will have to depend more on context to support word processing. For example, the word in Arabic "hamal" "حمل" (sheep), can, in another context can have the meaning of "hamal" "حمل" (carried). In effect, Arabic has two scripts: a shallow one when diacritical marks are used in the text and a deep (opaque) one when they are not. The linguistic situation and its relation to literacy is also unique. The spoken variety is different in many aspects from the written variety. In addition, some of the words in Arabic are pronounced similarly but are written differently, for example س-ص \ ت-ط \ ذ-ظ \ ك-ق \ د-ض. This phenomenon is known as homophones [30,31].

Additionally, there are unique orthographic and linguistic characteristics which may make the task of reading Arabic even more complex. First, 23 of the 29 letters in the alphabet have four shapes each (word initial, medial, final) and when they follow a non-connecting letter, for example, the phoneme /h/ is represented by the graphemes: and six letters have two shapes each, final and separate, such that the same phoneme is represented by different graphemes, and similar graphemes represent quite different phonemes (for example, the graphemes: represent the phonemes /t/,/b/,/y/, and /n/, respectively). Second, the majority of letters are connected to adjacent letters from both sides (right and left), except for six letters, that are connected only from the right side (r /ر/ ز/ d ذ /د/ a /ا/w (و. Thus, most words in the language are comprised of completely connected letters, or contain at least some connected letters, with letter strings composed of separate letters being very infrequent. Another pair of letters important to mention are (Lل / aا). What sets these two letters apart is the change in the shape of the connection and not in the shape of the letter itself When (a ا) appears before the (L ل) the conjunction will be displayed as (al لا) and when it appears after it the conjunction will be displayed as (la ال) [27,32].

Disparity in the reading speed in Arabic can also, in part, be explained by the difference in the distinctive orthographic features

of the language. In fact, readers of Arabic rely on visual/spatial processing during reading both for known and novel words. The reason for this is that the specific orthographic structure of the words in Arabic present the reader with a heavy cognitive load during reading. This, in turn, requires visual resources for the task, on top of the phonological processing that is taking place simultaneously. In addition, readers must synchronize the phonological processing with the visual processing in order to achieve accurate reading. Thus, in fact, the Arabic orthography relies on the visual memory, in addition to the effects of diglossia on reading acquisition in Arabic [2,33].

Consistent with the importance of orthographic processing in Arabic, measures that require this type of processing have been found to be predictive of Arabic literacy levels. For example, Elbeheri, Everatt, Mahfoudhi, Abu-Diyar and Taibah's, found that orthographic measures predicted variability in the comprehension fluency beyond that which was predicted by phonological measures in older mainstream children (grades 4 and 5) but not in the younger grades (2 and 3) [31]. This influence may not be due simply to greater literacy exposure since children with literacy learning problems (dyslexia) also show this influence of orthography. The finding that the influence of orthographic processing is explained by phonological processing measures in the younger cohort but not in the older groups is consistent with several models of reading acquisition that were developed for orthographies other than Arabic [31].

Another study by Eviatar and Ibrahim showed that the visual complexity of the Arabic orthography has a negative effect on reading [2]. Despite Arabic readers' strong phonological abilities, their performance was weak in reading measures (text reading as well as individual word reading) as compared to Hebrew readers. Moreover, they found a difference between whole text reading as compared to individual word reading. Error analysis showed that most of the reading errors were vowel errors which generally serve syntactical functions in the sentence, not errors in identifying root words. The conclusion was that the visual complexity of Arabic orthography makes phonological processing difficult and creates a perceptual cognitive load during reading [2].

Studies that looked at diglossia and its effects on proper reading among Arabic-speaking children note that the development of phonological abilities among Arabic speaking children is affected by its diglossia. This is especially true due to the fact that the sounds that exist in literary Arabic exist also in the various dialects [12,13,34].

These findings point to the fact that phonological and lexical structures are likely to be unknown to children when they begin the process of reading acquisition in first grade, which turns learning to read into a dual task, in which children must in parallel acquire an entirely new linguistic structure of phonological and lexical items, along with the orthography [35,36]. This new linguistic system that children will have to grapple with becomes even more challenging in certain cases in which phonological structures are unique to the literary words. Alphabet acquisition and the grapheme-phoneme connection is dependent on the extent of exposure and pre-existing knowledge of the phonological structures of the language. Therefore, reading development is dependent on linguistic development and prerequisite skills before children reach school age [8].

2.4 Spoken Language and its Influence on Reading Acquisition in Arabic

Spoken and standard language are two forms of the same uniquely human ability; the former has existed for about 100,000 years or more, the latter is younger, having existed only for about 5,000 years. Writing developed as an innovation of the human mind, together with the transition of mankind from hunter-gatherers to one with a political hierarchy. Speaking is based on the auditory channel and is available to all people without any direct training. It is acquired by infants or even during the later fetal months. Writing, on the other hand, relies on the visual channel and requires direct instruction. It is acquired after spoken language is ingrained and develops continually approximately from age five to twenty. Both forms of language, standard and spoken, complement one another, and neither is exclusive. The importance of the spoken language is not diminished even after reading and writing has been acquired. Just as text-related conversation helps children understand the importance of the standard word, at more advanced levels, conversation continues to accompany engagement with standard texts.

Learning to read is learning how one's writing system encodes one's language. This claim reflects the view that reading is fundamentally about converting graphic input (letters, words, characters) to linguistic-conceptual objects (words, morphemes, and their associated concepts). Moreover, what really forces this view of learning to read is the fact that the world presents learners with different writing systems. In what sense is learning to read in English like learning to read in Korean, Arabic, or Chinese? Each language is written in one or more distinctive graphic forms. In each case, the graphic forms are different in appearance and in how they connect to the language. What they have in common is that the learner must figure out how the graphic forms work—how they map onto the learner's spoken language (Charles, Perfetti, Dunlap, 2007).

In every language, the smallest sound unit of meaning is known as a phoneme. Changing a phoneme changes the meaning of a word. For example, the difference between "لمح" and"لمج" is a difference in the first phoneme of the word. The total number of phonemes in all human languages is more than 2,000, but in any given language the lexicon is made up of a limited number of phonemes (up to 40). It is a well-known fact that human babies are born with the capacity to distinguish individual phonemes, even those that do not exist in their native tongue, and the gender or voice quality of the speaker do not affect this ability. Discrimination between phonemes and word identification in spoken language are extremely rapid and automatic processes that do not require intentional attention [37].

In the Arabic-speaking elementary schools in Israel, in first and second grade, school time is used to develop letter recognition, decoding, and vocabulary in Standard Arabic. In the middle of third grade the major focus of study moves on from basic reading skills, and children are required to use reading for learning other topics. In addition, the transition from vowelled to unvowelled text begins in third grade. Reading unvowelled Arabic text is expected to be fluent by the end of 4th grade [38]. As explained above, the diglossic nature of Arabic is likely to impede the process of converting graphemes to phonemes even in its vowelled form. One reason for this is that graphemes might represent phonemes which are unknown in the young learners' spoken language. Another reason is the linguistic distance between the two forms of the language. This distance does not allow children to rely on the phonologic representations they have for the words in the spoken language, even though the vowelled Arabic orthography is shallow, or transparent. Hence, the acquisition of reading skills in Arabic requires the study of two systems in parallel: linguistic and orthographic.

The close correspondence between phonemes and graphemes is an important feature of the Arabic orthography and one that is expected to have an impact on the accuracy of single word decoding among Arabic speakers. However, short vowels are not regarded as independent graphemes in standard Arabic, but are represented as extra diacritical markings which are only present in religious texts, children's books, textbooks for foreign learners and in otherwise fully vowelized texts. Normal texts read by most older children and adults do not include these diacritical markings. Accordingly, a large number of Arabic words that appear in non-vowelized text are homographic when presented out of context. This means that the reader will have to depend more on context to support word processing. In effect, Arabic has two scripts: a shallow one when diacritical marks are used in the text and a deep (or opaque) one when they are not. The linguistic situation and its relation to literacy is also unique. The spoken variety is different in many aspects from the standard variety [32].

The continuity between early childhood oral skills and academic success in both oral and written skills shows that oral fluency may be a good predictor of academic success for many years, from elementary to high school. This conclusion fits with the conclusion of the present study, and, as we will see, has important educational repercussions. Many studies have proven that the factors of phonological awareness, the ability to name and identify letters automatically, as well as sentence memory can be predictors of literacy among children, including other factors such as socio-economic status and educational level of the parents, family background, etc. In other words, the combination of phonological awareness of the children and of the parents are solid predictors of literacy in early childhood [39].

According to Javer, the new curriculum in kindergartens and elementary schools in Israel was established in order to ensure that Arabic-speaking children reach an appropriate level in the standard language [40]. However, the starting point must be the language of the child, in other words, spoken Arabic. Others have claimed that it is critical not to disregard the linguistic richness that children bring with them to school, and never to instruct them to "forget" their spoken language, in order to learn the "proper" (standard) one. It is necessary to engender among children the concept that Arabic is a language with two forms: the spoken form and the standard form. Approximately 40% of the words in both languages are cognates, meaning they come from the same source, and teachers must take advantage of this pre-existing knowledge. In practice, despite the fact that this concept was embedded in the new curriculum, its application is quite problematic. Teachers are not provided with practical guidance regarding its implementation, and this is an area that needs further work [40].

Asaad & Eviatar also come to an important conclusion, that there are implications for teaching methods applied in literary Arabic and to spell Arabic at an early age [38]. For example, although there are many studies on phonological awareness in Arabic-speaking kindergartens, exposure to Standard Arabic is not built in. It is important to enrich the vocabulary in spoken Arabic, and in particular, highlight equivalent lexical entries in spoken Arabic and standard Arabic. There is continuity of similarity and difference in the phonological representation of spoken Arabic and standard Arabic. If the elements of this sequence are explicitly taught, it will allow children to use vocabulary knowledge to improve phonology decoding in first grade. Another important type of work is strengthening auditory understanding of standard Arabic. For example, simple instructions can be given in standard Arabic instead of in spoken Arabic. In addition, exposure to letters should begin early, with an emphasis on letters that represent sounds that do not appear in spoken Arabic [38].

One way to take advantage of the spoken language is through developing the code-switching mechanism of the brain. Code-switching (CS) refers to an alternation between languages, either within sentences or utterances (intra-sentential switching) or between sentences or utterances (inter-sentential switching). In language class, the switching between the target language and another language is usually found to be short and temporary, with the target language dominating the instructional time. CS in the classroom setting could occur within a speaker's utterance (s) (i.e., one single speaker within one interaction) or between different speakers (i.e., across separate interactions in separate contexts throughout the class or with two people speaking two languages) language input is significantly related to bilingual children's language development) [41]. The value of CS has been debated in the extant literature and a mixed perception of the use of CS in classrooms exists amongst educators and curriculum specialists [42-44].

Through this model, students differentiate between the use of the two languages in different contexts. This solution, along with others that will be suggested and analyzed in this study, must relate to the potential of good education and teacher training. Teachers must receive a solid foundation in language instruction in general, and in teaching children how to combine the two languages in

specific, such as using the aforementioned code-switching model. Similarly, Sun's study in Singapore dealt with code switching and how external factors can influence language and vocabulary development among bilingual children [44]. Sun emphasizes the importance of early child educators and parental involvement in order to help children handle the differences between their two languages [44].

However, it is important to note that there is a difference in the controversy regarding the use of the model among young children. There are researchers who consider the CS model to have no effect on language development among kindergarten children and others who consider this model to be have a positive and definite effect on the development of children's executive control [41,45]. This is also related to the classroom environment, and the extent to which the teacher uses CS, since the CS method requires the children to process and move through different languages, thereby strengthening their cognitive control network [42-44].

In light of this review, we can conclude that reading acquisition is affected by other aspects of linguistic proficiency, and each factor has a unique contribution. It is important to note that development of phonological abilities during early childhood is important not only in order to aid in the development of reading skills, but also simultaneously improves oral proficiency. The ability to manipulate phonological structures of a word develops during kindergarten and explains a significant part of the variation between reading ability among children during school. Thus, the purpose of this study is to examine the influence of spoken abilities, outlined above, on reading ability, including phonological awareness, letter naming, and real and non-word reading. This will provide us with a diagnostic tool to test for potential reading difficulties among kindergarten children. Kindergarten is often the first opportunity that educators have to intervene and identify children with signs of reading difficulties, as well as being a highly effective time for early intervention in order to close any expected performance gaps.

3. Research Questions

3.1 Central Research Question:

Can reading disabilities be diagnosed through spoken Arabic language?

3.2 Secondary Research Questions

- Can abilities in spoken Arabic at the pre-school level predict reading acquisition?
- Is there a correlation between language deficiency in Arabic in pre-school and reading disabilities?

4. Research Hypotheses

- **Hypothesis 1**
- There will be significant correlations between spoken and standard Arabic. The more normative the functioning is of the student in spoken Arabic, the more correct the functioning will be in the standard variety.
- **Hypothesis 2**
- There will be a positive correlation between proficiency in components of spoken Arabic as a native language and successful reading acquisition. This hypothesis is based on the assumption that typical development of spoken language is a predictor of reading acquisition.
- **Hypothesis 3**
- There will be a positive correlation between spoken language deficiency and reading disability (Dyslexia) among Arabic-speaking kindergarten-aged children. This hypothesis is based on the assumption that deficiencies in spoken language acquisition are predictors of deficient reading acquisition.

5. Method

This is a field study that includes a correlative analysis to analyze the statistical correlations between the primary variables of the study.

6. Research objectives

The purpose of this current study is to examine learning disabilities (reading) in kindergarten using spoken language, with the help of a new tool developed for the purpose of the current research, the aim of which is mapping and diagnosing reading disability among kindergarten children, in the spoken language in the Arab sector.

7. Participants

The study sample includes 40 students in kindergarten aged 5-6, in regular Arab kindergartens in Northern Israel. Two kindergartens have been chosen at random in the city of Acre. The native language of the students is Arabic. The students have been identified by the teacher as normative, typically developing students without a history of developmental or other disorders, and did not include special education students of the 40 children in the study, 21 were boys (52.5%) and 19 were girls. (47.5%). The mean age of all children in the study was M= 5.3 , SD = .464.

The children were sampled from two randomly selected kindergartens representing a normal population of children without developmental difficulties.

The children in the study were assigned to two kindergartens, one kindergarten we refer to as "S," which included 20 children, of whom 9 were boys (45%) and 11 were girls (55%). Their mean age was M= 5.1, SD = .366. The second kindergarten is referred to as "Z", which included 20 children, of whom 12 boys (60%) and 8 girls (40%) their Mean age was M= 5.4 = SD = .510.

8. Tools

The research instruments included the following areas which examine the independent variable "spoken language proficiency".
a.Phonological Awareness Test are skills that include phonological awareness, in other words, the ability to understand the sounds of a word in spoken language and to manipulate sounds on an individual syllable or sound, rhyming and identifying beginning and ending syllables (See Appendix 1 pages 38-48).

b.Linguistic Skills include lexical and grammatical knowledge that are the basis for communication in a wide variety of settings,

correct use of vocabulary and syntactical structures in speech, and the ability to orally express an explanation, description or story. This includes tasks of auditory processing (remembering a number of nouns in the order they were heard), linear instruction processing (remembering sentences with increasing amounts of information), sentence repetition, vocabulary knowledge, and semantic categories (categorical recall and object comparison) (see Appendix 2 pages 49-62).

c. Extensive Conversation Skills/Listening Comprehension and Oral Expression are the communicative skills of spoken language and they require comprehension and expression of many types in a variety of knowledge areas. This skill set is tested by a task of telling a story based on a series of pictures. The task includes four levels: object naming, relating to object features and concepts, processing complex instructions, and information processing that requires analysis beyond object naming (See Appendix 3 pages 63-70).

Research Tools used for testing the independent variable (reading ability in kindergarten) (See Appendix 4 pages 71-83) was a series of tests that assess code skill ability, described above. It is important to note that students were tested using a standard assessment tool, administered by the kindergarten teachers. This assessment battery relates to functioning in the following areas:

- Fine-motor skills (drawing, cutting, gluing etc.)
- Gross motor skills (running, jumping, climbing, etc.)
- Hand-eye coordination
- General cognitive abilities (color differentiation, counting, knowledge of left and right)
- Linguistic skills (phonological awareness, vocabulary, familiarity with print)

The assessment is based on observations of the performance, cognitive functioning and behavior of the students. It is an open assessment, without set norms. The data from this standard assessment was collected from the kindergarten teachers, as a basis for comparison of students' performance on the assessment of the present study.

9. Variables

9.1 Independent Variables

- Code skills in the Arabic language
- Linguistic skills in Arabic
- Extensive conversational skills in Arabic

9.2 Dependent Variable

- Reading readiness (phonological awareness, letter naming, word recognition, word-object matching, word reading)

10. Procedure

Following attainment of the necessary approval of the bodies involved, the researcher visited the kindergartens at the beginning of the school year. This timing was chosen since it precludes the possibility of additional factors in the kindergarten affecting the research findings. In the first stage, data was collected from the kindergarten teacher, including the standard assessment findings. Following this, the diagnostician assessed children's spoken language skills by asking them to perform a number of tasks. The three independent variables (code skills, linguistic skills, and extensive conversation skills) were assessed by means of these tests, together with the dependent variable (reading readiness): phonological awareness, letter naming, and real word reading.

The interaction effect between the measures of spoken proficiency and the independent variable (reading level) was measured using coefficients of linear regression in order to analyze the various measures, and the degree to which they can effectively account for the independent variable spoken proficiency and reading level. In addition, a T-test was performed to analyze the differences and variance between the kindergarten students.

a. Data collection method: the study is quantitative and analyzed the correlation between linguistic skills and spoken proficiency on one hand, and reading skills on the other.

b. Data analysis method: the data was analyzed by checking the correlation between the independent variable (spoken language proficiency, composed of code skills, linguistic skills, and extensive conversation skills as described above), and the dependent variable (reading ability).

The results were statistically analyzed to test the reliability coefficients and the internal consistency of the test measures (Cronbach's α).

The statistical means and the standard deviation of the variables of the study were calculated. The correlation between spoken language proficiency and reading ability were analyzed. A regression analysis was performed to analyze the degree to which spoken language proficiency in kindergarten can be considered a predictor of reading ability.

11. Results

The findings are presented below according to the research topics and hypotheses.

The topic of the activity	Details of the activity and alpha reliability	Example
Phonological awareness	Phonological awareness: Rhyming (a = .65)	Identifying rhyming pictures pairs
	Phonological awareness: Decomposition into Syllables (a = .73)	Decomposition of pictures into syllables
	Phonological awareness: Opening letter (a = .67)	Identifying a pair of pictures with the same opening sound
Linguistic skills	Items that match the target image (a = .68)	Select the image that match the target image

	Completing a missing word(a = .81) Auditory processing (a = .80) Knowledge of vocabulary (a = .79) Serial thinking (a = .84)	Production of the appropriate word in the context of the sentence related to the picture Reconstruction a set of words heard Picture description and answering accompanying questions Arranging 4 pictures in a row and telling the story
Discourse skills	Cause and effect (a = .78) Naming objects (a = .81)	Description of the connection between two pictures Production of the names of 15 images
	Processing complex verbal instruction (a = .79) Reference to the properties of objects and concepts (a = .80)	Repeating a series of instructions according to difficulty levels in ascending order Selecting the target image according to the sentence heard

Table 1: Details of the Diagnostic Indices and Alpha Reliability Values of Each Index - Spoken Language

The topic of the activity	Details of the activity and alpha reliability	Example
Phonological Awareness	phonological awareness: Rhyming (a = .64)	Identify rhyming words pairs
	phonological awareness: Decomposition into Syllables (a = .71)	Decomposition of words into syllables
	phonological awareness: opens letter(a = .80)	Identifying a pair of words with the same opening sound
	Phonological awareness: opens letter in alphabetical (a = .88)	Selecting the opening letter that Appropriate the word
Reading	Word Reading (a = .78)	Drawing a line between the word and its image.
	Retrieval in alphabetical order (a = .79)	Identify the missing letter in alphabetical order

Table 2: Indices by Test Area and Alpha Reliability Values of Each Index - Standard Language

It is clear that there is no statistically significant difference between the two assessments (the research test and the kindergarten teacher's report) according to the level of accuracy in all four phonological awareness levels: rhyme level, syllable level, combination level and phoneme level. This indicates that the findings are quite similar between the students' performance in the research assessment and the kindergarten teacher's reports on their performance, in the various measures of Phonological Awareness.

The name of the index	Type of diagnosis	N	Mean (Std.)	F Values	
				Accuracy test	P
The level of rhyme	Standard study anchor questionnaire	40	4.52 .50	52.5%	.61
	The research kit	40	3.47 (1.55)	60.1%	
Syllable level	Standard study anchor questionnaire	40	3.70 (1.11)	70%	.84
	The research kit	40	3.47 (1.55)	61.2%	
Recognizing letters and their sounds	Standard study anchor questionnaire	40	4.80 (.40)	80%	.87
	The research kit	40	9.87 (.33)	87%	
***p<0.005 **p<0.001 ***P<0.00**					

Table 3: Means and Standard Deviations, and F Values of Achievements in the General Indices of Phonological Awareness (Spoken Language)

In all the tests that assess the children's linguistic skills, no significant differences were found between their performance and the kindergarten teacher's report. This further confirms that the current test is effective and representative.

The name of the index	Type of diagnosis	N	Mean (Std.)	F Values	
				Accuracy test	P
Items that belong to the target image	The research kit	40	9.2 (.86)	55%	.441
Completing a missing word		40	3.9 (1.15)	97%	

Auditory processing		40	11.8 (4.5)	45%	
Serial thinking		40	1.45 (.50)	45%	
Linguistic skills	Standard study anchor questionnaire	40	3.8 (.79)	77.5%	
***p<0.005 **p<0.001 ***P<0.00**					

Table 4: Means and Standard Deviations, and F Values of Achievements in the General Indices of Linguistic Skills (Spoken Language)

When examining the differences between our assessment and the kindergarten teacher's reports on children's achievement in discourse skills in the spoken language there are no significant differences between them, indicating overlap in results examining children's accuracy in spoken language skills.

The name of the index	Type of diagnosis	N	Mean (Std.)	F Values	
				Accuracy test	P
Cause and effect	The research kit	40	15.9 (.70)	85%	.597
Naming objects		40	14.3 (1.33)	87%	
Processing complex verbal instruction		40	3.40 (1.21)	75%	
Reference to the properties of objects and concepts		40	9.72 (.55)	87.5%	
Discourse skills	Standard study anchor questionnaire	40	9.60 (1.86)	77%	
***p<0.005 **p<0.001 ***P<0.00**					

Table 5: Means and Standard Deviations, and F Values of Achievements in the General Indices of Discourse Skills (Spoken Language)

It is clear that there is a statistically significant interaction between our assessment and the kindergarten teacher's reports, according to the level of accuracy in all the tests that examine the children's language knowledge of the standard language. Details of the source of the interaction in each of the tests of linguistic knowledge in the standard language can be found in Table 7.

The name of the index	Type of diagnosis	N	Mean (Std.)	F Values	
				Accuracy test	Interaction
Phonological awareness: Rhyming	The research kit	40	6.55 (3.17)	72.5%	.732*
Phonological awareness: Decomposition into Syllables		40	9.12 (1.24)	57.5%	
Phonological awareness: opens letter		40	17.7 (5.91)	82%	
Words Reading		40	2.30 (3.05)	77.5%	
Retrieval in alphabetical order		40	7.57 (5.44)	85%	
Reading skills	Standard study anchor questionnaire	40	9.84 (2.24)	82.5%	
***p<0.005 **p<0.001 ***P<0.00**					

Table 6: Means and Standard Deviations, and F Values of Achievements in the General Indices of Reading Skills (Standard Arabic)

The findings in Table 7 indicate a strong correlation between the phonological awareness indices in the standard language in the current assessment and the data collected from the kindergarten teacher according to the standard questionnaire in kindergartens.

- **Rhyme Level:** The interaction findings indicate that the children achieved statistically significant scores in this index, between the percentage of accuracy in the current assessment of the study and the level of accuracy according to the standard assessment in kindergarten.
- **Syllable Level:** The findings of the interaction indicate that in the test of decomposition of syllables there is a statistically significant interaction in the achievements among the children in both the current test and the standard test.
- **Initial Sounds:** A significant interaction was found between the opening sound recognition test that assesses the phonological awareness of the children. The two test scores were found to

be significant according to accuracy percentages.

- **Word Reading and Retrieval in Alphabetical Order:** No comparison was made in examining the differences between word reading and alphabetical control ability since the kindergarten teacher did not test these skills.

	Type of diagnosis	N	Mean (std. deviation)	F Values	
				Accuracy test	Interaction
Phonological awareness: Rhyming	The research kit* Standard study anchor questionnaire	40	6.55 (3.17)	72.5%	.71* (0.02)
Phonological awareness: Decomposition into Syllables		40	9.12 (1.24)	57.5%	.76** (0.01)
Phonological awareness: opens letter		40	17.7 (5.91)	82%	.65*** (0.00)
Word Reading		40	7.57 (3.05)	85%	.45** (0.03)
Retrieval in alphabetical order		40	2.30 (5.44)	77.5%	----------
					----------
***p<0.005 **p<0.001 ***P<0.00**					

Table 7: Details of the Source of the Interaction in Each of the Language Knowledge Tests

12. Testing Research Hypotheses

12.1 The Correlation Between the Spoken Language and the Standard Language

In the first research hypothesis it was argued that the more normative the student is functioning in spoken Arabic, the more correct the functioning will be in the standard language. To test this hypothesis, Pearson correlations were calculated between phonological awareness indices (Spoken language) and phonological death indices (Standard language).

These results validate the first hypothesis, indicating a relationship between the phonological awareness in the spoken language and the phonological awareness in the standard language, as expected, positive relationships were found between phonological awareness in the standard language and all the indices of phonological awareness in the spoken language. A distinct and strong positive correlation is found between Rhyming and standard language, as much as the children in kindergarten mastered the rhyming words in the spoken language, the better abilities they showed in phonological awareness in the standard language. This indicates that the higher the achievement in phonological awareness in the spoken language, the higher the achievement in phonological awareness in standard language.

	Rhyming	Decomposition into Syllables	opens letter	opens letter in alphabetical order	Standard language
Rhyming	-	.402**	.230*	.292*	.327**
Decomposition into Syllables	.402**	-	.261*	.320**	.410**
opens letter	.230*	.261*	-	.319**	.251*
opens letter in alphabetical order	.292*	.320**	.319**	-	.311**
Standard language	.327**	.410**	.251*	.311**	-
***p<0.005 **p<0.001 ***P<0.00**					

Table 8: Pearson Correlations Between Phonological Awareness Indices (Spoken Language) and Phonological Awareness Indices (Standard Language) (N=40)

12.2 Predicting Reading Ability Using Spoken Language Indices

The second hypothesis was that we would be able to predict reading ability using the spoken language indices, for which purpose a multiple linear regression equation was calculated. Spoken language indices were introduced into the equation as predictive variables. It should be noted that the correlation between the predictive variables was high ($p = .000$, $r = .75$).

Although the indices (Serial thinking, reference to the properties of objects and concepts, object naming, matching items that belong to the target image) are not indicative of significance.

From the regression findings, which are presented in Table 9, it appears that the reading index can be clearly predicted using the various measures of the spoken language. The percentage of

explained variance was very high in the phonological awareness, in the index of letter and sound recognition (54.8%), processing complex verbal instruction index (56%) object naming (43%) and in the auditory processing index (29.9%). According to the standardized regression coefficients (β), the unique contribution of the indices in the spoken language to the explanation of the variance was positive and significant.

These results validate the second hypothesis, and the variables that have contributed to this significance are auditory processing and letter and sound recognition as well as decomposition into sounds in addition to the lexical knowledge.

Predictive variables	B	SE B	β	T	R2	Sig
Decomposition into sounds	.735	.267	.408	2.759	16.7	.009
Decomposition into syllables	.751	.329	.334	2.182	11.1	.035
Recognizing letters and their sounds	1.59	.236	.740	6.781	54.8	.000
Items that belong to the target image	.543	1.349	.543	.402	.04	.690
Completing a missing word	1.28	.482	.397	2.66	15.8	.011
Auditory processing	1.60	.398	.547	4.02	29.9	.000
Knowledge of vocabulary	1.843	.848	.333	2.17	11.1	.036
Serial thinking	.132	.098	.215	1.35	4.6	1.83
Cause and effect	.129	.061	.324	.211	10.5	.041
Naming objects	.435	.333	.435	1.308	43	.199
Processing complex verbal instruction	.544	.362	.237	1.503	56	.141
Reference to the properties of objects and concepts	.157	.817	.310	.192	.01	.849

Table 9: Regression Findings for Predicting A Reading Index Using Spoken Language Indices

12.3 The Correlation Between Linguistic Skills (Spoken Language) and Reading Skills (Reading)

The third research hypothesis argued that deficiencies in spoken language acquisition are predictors of deficient reading acquisition. To test this hypothesis, Pearson's correlations were calculated between linguistic skills (spoken language) and reading skills (reading). The correlations are shown in Table 10.

	Items that belong to the target image	Completing a missing word	Auditory processing	Serial thinking	Reading skills
Items that belong to the target image	-	.526**	.214*	.296*	.389**
Completing a missing word	.526**	-	.251*	.320**	.410**
Auditory processing	.214*	.251*	-	.319**	.280*
Serial thinking	.296*	.320**	.319**	-	.377**
Reading skills (Reading)	.389**	.410**	.280*	.377**	-
*p<0.005 **p<0.001 ***P<0.00					

Table 10: Pearson Correlations Between Linguistic Skills (Spoken Language) and Reading Skills (Reading) (N=40)

The findings show in Table 10 that a statistically significant relationship was found between all the indices at the language skills in the spoken language and the reading skills. when we combined all the indices, into one variable called language skills we found that ($p < 0.05 = 0.001$) and the relationship is strongly positive (Rp=.469**). This indicates that the more normative the spoken language skills among preschoolers, the stronger their reading skills. Conversely, if there is a decrease (difficulty) in the spoken language skills, the reading skills among the children decrease. This indicates that hypothesis number three has been fully confirmed [46-49].

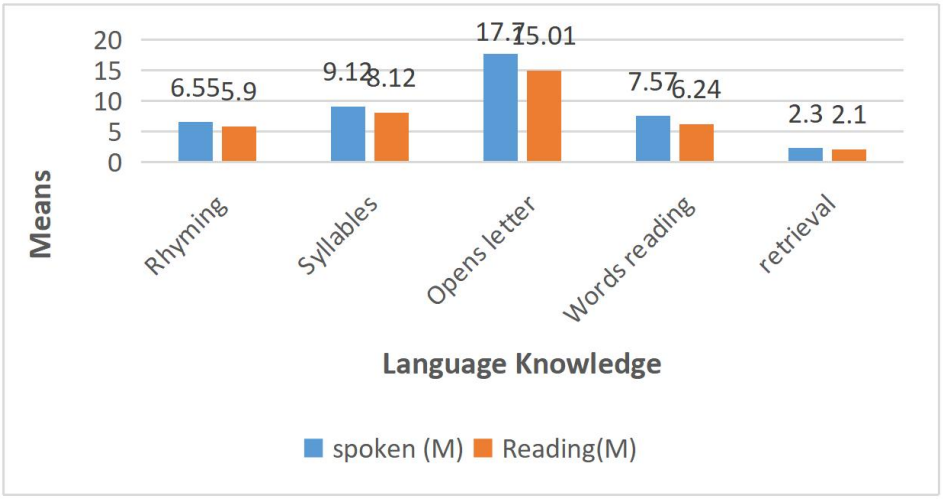

Figure 1: Comparison of Averages Among Children in both Spoken and Standard Language

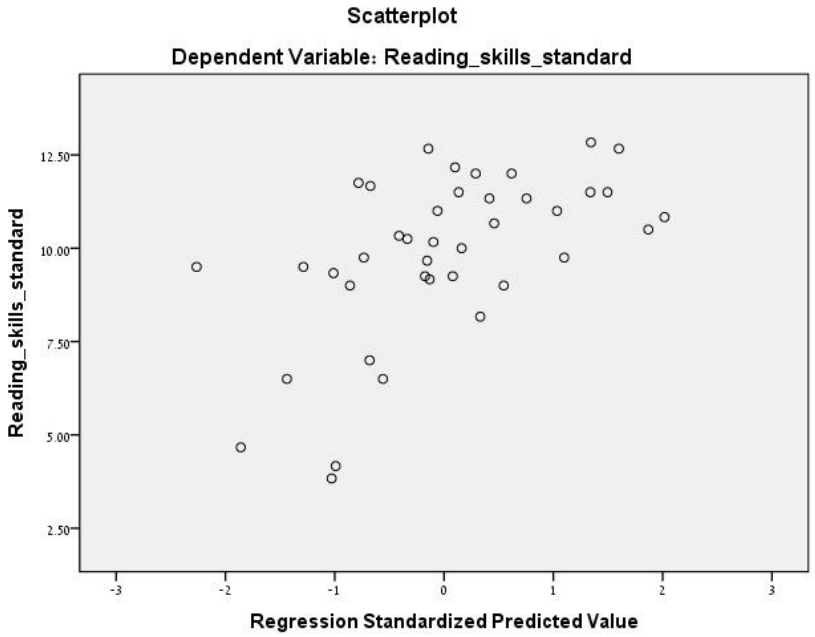

Figure 2: Diagram for Predicting Reading Skill in the Context of Spoken Language

References

1. Dickinson, D. K., Golinkoff, R. M., & Hirsh-Pasek, K. (2010). Speaking out for language: Why language is central to reading development. *Educational researcher, 39*(4), 305-310.
2. Eviatar, Z., Ibrahim, R., Karelitz, T. M., & Simon, A. B. (2019). Speed of reading texts in Arabic and Hebrew. *Reading and Writing, 32*(3), 537-559.
3. Ozernov-Palchik, O., Norton, E. S., Sideridis, G., Beach, S. D., Wolf, M., Gabrieli, J. D., & Gaab, N. (2017). Longitudinal stability of pre-reading skill profiles of kindergarten children: implications for early screening and theories of reading. *Developmental science, 20*(5), e12471.
4. Breznitz, Z. & Yamin, R. (2008). Diagnosis, measurements and assessment from kindergarten to second grade- a status report and assessment staff recommendations on the subject of diagnosis and assessment in early childhood. Jerusalem: The applied education initiative.
5. Vellutino, F. R., Scanlon, D. M., Small, S., & Fanuele, D. P. (2006). Response to intervention as a vehicle for distinguishing between children with and without reading disabilities: Evidence for the role of kindergarten and first-grade interventions. *Journal of learning disabilities, 39*(2), 157-169.
6. Shatil, E., & Share, D. L. (2003). Cognitive antecedents of early reading ability: A test of the modularity hypothesis. *Journal of experimental child psychology, 86*(1), 1-31.

7. Dickinson, D. K., McCabe, A., Clark–Chiarelli, N. A. N. C. Y., & Wolf, A. (2004). Cross-language transfer of phonological awareness in low-income Spanish and English bilingual preschool children. *Applied Psycholinguistics, 25*(3), 323-347.
8. Schiff, R., & Saiegh-Haddad, E. (2018). Development and relationships between phonological awareness, morphological awareness and word reading in spoken and standard Arabic. *Frontiers in psychology, 9,* 356.
9. Al Suwaiyan, L. A. (2018). Diglossia in the Arabic language. *International Journal of Language and Linguistics, 5*(3), 228-238.
10. Al-Sobh, M. A., Abu-Melhim, A. R. H., & Bani-Hani, N. A. (2015). Diglossia as a result of language variation in Arabic: Possible solutions in light of language planning. *Journal of Language Teaching and Research, 6*(2), 274.
11. Saiegh-Haddad, E., & Lina, H. A. J. (2018). Does phonological distance impact quality of phonological representations? Evidence from Arabic diglossia. *Journal of Child Language, 45*(6), 1377-1399.
12. Saiegh–Haddad, E. L. I. N. O. R. (2003). Linguistic distance and initial reading acquisition: The case of Arabic diglossia. *Applied Psycholinguistics, 24*(3), 431-451.
13. Saiegh-Haddad, E. (2005). Correlates of reading fluency in Arabic: Diglossic and orthographic factors. *Reading and Writing, 18*(6), 559-582.
14. AlBzour, N. N., & AlBzour, B. A. (2015). Arabic uniglossia: Diglossia revisited. *Studies in Literature and Language, 10*(3), 7.
15. Socher, M., Ellis, R. J., Wass, M., & Lyxell, B. (2020). Comparison of expressive spoken language skills in children with cochlear implants and children with typical hearing. *Frontiers in Psychology, 11*, 1405.
16. Reis, A., Araújo, S., Morais, I. S., & Faísca, L. (2020). Reading and reading-related skills in adults with dyslexia from different orthographic systems: A review and meta-analysis. *Annals of dyslexia, 70*(3), 339-368.
17. Balcı, E. (2017). Dyslexia: definition, classification and symptoms. *SDU International Journal of Educational Studies, 4*(2), 166-180.
18. Vender, M., & Melloni, C. (2021). Phonological awareness across child populations: How bilingualism and dyslexia interact. *Languages, 6*(1), 39.
19. Owen, E. R. (2014). Language disorders: A functional approach to assessment and intervention. Pearson, *USA*.
20. Adlof, S. M., Perfetti, C. A., & Catts, H. W. (2011). Developmental changes in reading comprehension: Implications for assessment and instruction.
21. Shiran, A., & Breznitz, Z. (2011). The effect of cognitive training on recall range and speed of information processing in the working memory of dyslexic and skilled readers. *Journal of neurolinguistics, 24*(5), 524-537.
22. Stanovich, K. E. (2009). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Journal of education, 189*(1-2), 23-55.
23. McNamara, J. K., Scissons, M., & Gutknecth, N. (2011). A longitudinal study of kindergarten children at risk for reading disabilities: The poor really are getting poorer. *Journal of learning disabilities, 44*(5), 421-430.
24. Balci, E. (2020). Early Predictors for Kindergarten Students at Risk for Dyslexia: A Two-Year Longitudinal Study. *International Journal of Progressive Education, 16*(3), 201-210.
25. Hassunah Arafat, S., Korat, O., Aram, D., & Saiegh-Haddad, E. (2017). Continuity in literacy achievements from kindergarten to first grade: A longitudinal study of Arabic-speaking children. *Reading and Writing, 30*(5), 989-1007.
26. Ebert, K. D., & Pham, G. (2019). Including nonlinguistic processing tasks in the identification of developmental language disorder. *American journal of speech-language pathology, 28*(3), 932-944.
27. Ibrahim, R., & Eviatar, Z. (2012). The contribution of the two hemispheres to lexical decision in different languages. *Behavioral and Brain Functions, 8*(1), 3.
28. Vaknin-Nusaum, V., Sabah, S., & Abbas, R. (2018). The contribution of morphological awareness to reading comprehension in Arabic. In Mahul B. and Ostein E. (Eds.), *Linguistic development among Arabic speakers in a multilingual society Mofet Institute: A series of books on education and culture* (pp. 45-65). Jerusalem: Mofet Institute.
29. Share, D. L. (2008). On the Anglocentricities of current reading research and practice: the perils of overreliance on an" outlier" orthography. *Psychological bulletin, 134*(4), 584.
30. Abu-Rabia, S., & Taha, H. (2006). Reading in Arabic Orthography; Characteristics, Research Findings, and Assessment. I: Handbook of Orthography and Literacy. Joshi, R. Malatesha og PG Aaron (red).
31. Elbeheri, G., Everatt, J., Mahfoudhi, A., Abu Al-Diyar, M., & Taibah, N. (2011). Orthographic processing and reading comprehension among Arabic speaking mainstream and LD children. *Dyslexia, 17*(2), 123-142.
32. Mahfoudhi, A., Everatt, J., & Elbeheri, G. (2011). Introduction to the special issue on literacy in Arabic. *Reading and Writing, 24*(9), 1011-1018.
33. Eviatar, Z., & Ibrahim, R. (2014). Why is it hard to read Arabic?. In *Handbook of Arabic literacy: Insights and perspectives* (pp. 77-96). Dordrecht: Springer Netherlands.
34. Al-Huri, I. (2015). Arabic language: Historic and sociolinguistic characteristics. *English Literature and Language Review, 1*(4), 28-36.
35. Ibrahim, R., Eviatar, Z., & Aharon-Peretz, J. (2002). The characteristics of arabic orthography slow its processing. *Neuropsychology, 16*(3), 322.
36. SAIEGH–HADDAD, E. L. I. N. O. R. (2004). The impact of phonemic and lexical distance on the phonological analysis of words and pseudowords in a diglossic context. *Applied Psycholinguistics, 25*(4), 495-512.
37. Vihman, M. M. (2017). Learning words and learning sounds: Advances in language development. *British Journal of Psychology, 108*(1), 1-27.
38. Asaad, H., & Eviatar, Z. (2014). Learning to read in Arabic: The long and winding road. *Reading and Writing, 27*(4), 649-

664.
39. Heath, S. M., Bishop, D. V., Bloor, K. E., Boyle, G. L., Fletcher, J., Hogben, J. H., ... & Yeong, S. H. (2014). A spotlight on preschool: The influence of family factors on children's early literacy skills. *PloS one, 9*(4), e95255.
40. Javer, C. (2011). Topics of applied research to policy design in instruction of the Arabic language. Academic meeting report (51-52). Jerusalem: The applied education initiative of the national Israeli Academy of the Sciences.
41. Place, S., & Hoff, E. (2011). Properties of dual language exposure that influence 2-year-olds' bilingual proficiency. *Child development, 82*(6), 1834-1849.
42. Chavez, M. (2016). The first language in the foreign language classroom: Teacher model and student language use–an exploratory study. *Classroom Discourse, 7*(2), 131-163.
43. Probyn, M. (2015). Pedagogical Translanguaging: Bridging Discourses in South African Science Classrooms. *Language and Education, 29*(3), 218-234.
44. He, S. U. N., Yussof, N., Vijayakumar, P., Gabrielle, L. A. I., O'BRIEN, B. A., & Ong, Q. H. (2020). Teacher's code-switching and bilingual children's heritage language learning and cognitive switching flexibility. *Journal of child language, 47*(2), 309-336.
45. David, A., & Wei, L. (2008). Individual differences in the lexical development of French–English bilingual children. *International Journal of Bilingual Education and Bilingualism, 11*(5), 598-618.
46. Abu-Rabia, S. (2000). Effects of exposure to literary Arabic on reading comprehension in a diglossic situation. *Reading and writing, 13*(1), 147-157.
47. American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders. *5th 1189 Edn*.
48. Aram, L., Krane, E. J., Kozloski, L. J., & Yaster, M. (2001). Tunneled epidural catheters for prolonged analgesia in pediatric patients. *Anesthesia & Analgesia, 92*(6), 1432-1438.
49. Atallah, E. (2012). Dictionary of Arabic Quadriliteral Colloquial Verbs in Al-Jalil.