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*Corresponding author: Saied Bishara, Department of Special Education, Beit Berl College, Beit Berl, Israel; Department of Special Education, Al-Qasemi College, Baqa-Elqarbia, Israel; Department of Education and Psychology, Open University, Ra'anana, Israel
E-mail: saied@beitberl.ac.il

Reviewing editor:
John Schwieter, Wilfrid Laurier University, Canada

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TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE

Correlation between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Arabic as first language and Hebrew as second language

Saied Bishara^{1,2,3*} and Itzhak Weiss⁴

Abstract: Phonological and morphological awareness and its correlation with reading punctuated and non-punctuated words in Arabic as a first language were examined, as well as its transfer to Hebrew as a second language. Research participants were 30 fourth grade pupils. Phonological awareness was examined by phonological decoding of actual and meaningless words. Morphological awareness was examined by morphological production and distinguishing morphological relationships. Participants read punctuated, non-punctuated, and meaningless words. Findings supported hypotheses: phonological awareness and reading words in Arabic positively correlated with phonological awareness and reading words in Hebrew and morphological awareness in both languages correlated with accuracy and speed of reading punctuated and non-punctuated words in Hebrew. Research findings have practical implications for the reading curriculum in both languages.

Subjects: Social Sciences; Development Studies; Education

Keywords: phonological awareness; morphological awareness; punctuated words; non-punctuated words; Arabic language; Hebrew language

1. Introduction

This article describes research that examined the phonological and morphological awareness and how it is correlated with the ability to read punctuated and non-punctuated words in Arabic as first language and Hebrew as second language. Phonological awareness is a meta-linguistic skill that is associated with the ability to read. It is defined as the ability to relate to the smallest linguistic units and understand that words contain syllables, rhymes and phoneme. Phonological awareness can be a predictor of academic achievements. Research shows that phonological awareness can be taught

ABOUT THE AUTHOR

Dr Saied Bishara, finished his doctorate at Bar Ilan University specializing in learning disabilities and special education. He works in several colleges: Beit Berl College, Alqasemi College and the Open University in Israel. He is currently the Head of the Special Education Department at Beit Berl College. He has published studies concerning literacy and math ability of students with learning disabilities.

PUBLIC INTEREST STATEMENT

The proposed model is to improve the procedure for estimating two sensitive characteristics at a time by introducing equal probabilities of protection on the randomized devices. The proposed model and estimators have been shown to be more robust and efficient than the conventional ones. Therefore, with the use of proposed model social science researchers and those in behavioral science have little or no problem in examining sensitive issues such as induced abortion, drug abuse, tax evasion, illegal possession of arms and all embarrassing or illegal activities.

and that pupils that develop this skill advance their reading skills. Moreover, it is recommended that teachers choose activities that increase the phonological awareness of their pupils before they start teaching reading skills formally. The phonological awareness of pupils may improve as their reading skills improve (Ball, 2000; Moshkovitz, 2002; Taha, 2009).

The research examined whether strategies acquired in the first language were transferrable to the second language and were used while the second language was acquired. Understanding the processes at the foundation of reading in first language as opposed to second language may assist in the planning and intervention process of acquiring a second language. The research of these correlations may allow for a better understanding and more efficient planning of the curriculum; it is possible the research will identify specific difficulty centers in learning the language and suggest intervention programs.

2. The connection between phonological awareness and reading development

Phonology is the body of knowledge that deals with the sound of words in language. Phonological awareness deals with children's ability to distinguish, process and, use sub-lexical units of a language such as syllables, rhymes, and phoneme. Phonological awareness is expressed in the ability to carry out mental operations on parts of speech such as dropping the beginning, middle, or end of a word (Koda, 2001; Moshkovitz, 2002).

Phonological development can be observed by assessing the ability to distinguish between graphology and phoneme; in other words, knowing how to use conversion rules from letters to phoneme. The phonological awareness is also reflected in the ability to rhyme, identify repetitive sound patterns, break down words to syllables, and combine syllables into sounds and words. The development of phonological awareness begins in kindergarten, when children are exposed to reading, then intensifies during elementary school when the child is exposed to the entire reading process. In other words, phonological awareness supports a proper reading process and the reading process in return, affects the development of phonological awareness (Moshkovitz, 2002; Taha, 2009).

Researchers Ziegler and Goswami claim that acquiring language affects the development of phonological representations, the awareness of sound and familiarity with the sound of various phonemes. The development of phonemic awareness at the level of core sounds requires direct teaching. Therefore, the learning of letters and writing of syllables and words contribute to the development of phonological awareness. Per these two researchers, understanding the correlation between the sounds and their written representations (symbols) in language supports the process of reading and spelling. Acquiring this skill facilitates the learning of how to read and write a vast number of words. Phonological decoding is the process of breaking down the sound while reading the symbol that represents it (Ziegler & Goswami, 2005).

For children to be able to internalize and apply the principle of letter-sound relationship while reading and spelling, they must first acquire proper level of awareness (phonological) to the sounds and structure of the words in a language (Taha, 2009).

The two languages at the center of this research, Hebrew and Arabic, are ordinary alphabet languages. In other words, there is a congruence between the graphemic representation (visual part) and the phonemic representation (the sound part). Even so, there are differences between the two languages in terms of shallowness (the methodical degree with which one can convert the graphemic representation to a phonological representation among various phonographic orthographies). The strategies employed by the reader to decode the phonological code in a specific orthographical system are largely determined by the internal structure of the system and its unique characteristics. In other words, in the way the phonological code is visually represented. Therefore, a reader that acquired strategies that fit his first language may be able to deal more efficiently with a second language that has a different internal phonological structure (Abu-Rabiaa, 2000; Koda, 2001; Moshkovitz, 2002).

Research about the correlation between phonological processes and reading achievements referenced the following linguistic aspects:

- (1) *The coding of phonological information in short-term memory*: The ability to present verbal stimuli in the form of sounds (phonology) in short-term memory. A difficulty in acquiring this skill leads to creating unsuitable and non-correlated phonological codes.
- (2) *Recalling phonological information from long-term memory*: The ability to recall phonological information from long-term memory. To succeed requires retrieval and application skills as well as access to one's mental lexicon (the storage of vocabulary in the long-term memory where word representation is found). A difficulty with this skill leads to substituting words based on semantics.
- (3) *Use of phonological codes in active memory*: The ability to use phonological codes to store verbal information in the active part of the memory.
- (4) *Phonological awareness*: Phonological awareness is the alertness to the existence of phonological elements (sounds) in a word and the ability to perform various operations with these sub-parts (synthesis, analysis, subtraction, addition, opposite, phoneme etc.). The correlation between phonological ability and success in reading is bi-directional; on one hand, phonological awareness is a precursor to acquiring the ability to read and on the other, learning to read supports the development of the awareness to the sounds of the spoken language because these elements become visible.

Research shows that phonological awareness correlates with the following variables: age, vocabulary, linguistic environment of the child and as mentioned previously, the child's reading, and comprehension abilities (Ball, 2000; Ravid & Tolchinsky, 2002).

3. The correlation between morphological awareness and reading development

Morphological awareness is the ability to relate to the components of a word and their function (patterns, root, structure, affixes). In other words, becoming familiar with the inner structure of words and the rules by which words are formed. Morphology deals with the smallest unit of a word that carries some meaning. This unit is called morpheme and in Hebrew—Tzoran. Tzoran can include one letter “ט” (Taf, last letter in the Hebrew alphabet) to denote female in Arabic and the letter “ה” (Hey—the fifth letter in the Hebrew alphabet) to denote female in Hebrew; it can also include more than one letter and up to a full word such as *ولد* (boy) in Arabic or *בית* (home) in Hebrew (Moshkovitz, 2002).

In morphology, there are two types of morphemes: derivative morphemes and conjugation morphemes. The derivative morphemes create new words by adding affixes to the root word in a way that creates an independent linguistic form. Adding the affixes changes the meaning of the base word and in certain cases, even its syntax category. On the other hand, conjugation morphemes are affixes that are added to the root word to denote information such as time, gender, number, and pronoun designation; with this type of morpheme the meaning of the word is preserved but as mentioned previously, we get additional information about the root word from different angles (Moshkovitz, 2002; Taha, 2009). As all semantic languages, the Arabic and Hebrew languages are rich with morphology because much information is delivered through morphemes: prepositions, pronouns, verb conjugations (pronoun, gender, number and time), name conjugations (gender, number and pertinence), roots, grammatical structures, and patterns (Rom, Segel, & Zur, 2005).

Morphological awareness is essential to acquiring reading skills because it contributes to vocabulary expansion and proper ability to read and write. A research that compared ordinary children to children with a learning disability in reading revealed that the latter were less successful in executing tasks that required morphological awareness. The quality of the correlation between morphology and reading is demonstrated in the child's ability to analyze words and their morphological components to produce meaning (Ben-Dror, Bentin, & Frost, 2003).

Handling word morphology also supports proper access to lexicon. In other words, the ability to identify the core structure of a word separates it from affixes and looks for its proper location in the mental lexicon (Carlisle, 2000; Moshkovitz, 2002).

Carlisle's research (2000) revealed that measuring morphological awareness using morphological derivative tasks during kindergarten was a reliable predictor of reading comprehension in 2nd grade. We can therefore conclude that morphological awareness strengthens reading skills such as identifying the structure of words and understanding them properly.

The researchers Elbro and Arnbak (1996) focus on the importance of morphological awareness to master the reading and spelling processes. In their opinion, it allows the learning of orthographic structures essential to reading and spelling. This awareness plays an important role in predicting the meaning of words in a language and helps organize the mental orthographic lexicon based on morphological relevance by structure of the entire word. Also, morphological awareness helps organize the orthographic lexicon by morphological relevance and in doing so, eases the process of understanding the meaning of words when reading.

The ability to understand the morpho-orthographic structure of words requires familiarity with the word's structure and the separation of the root word from any affixes. This understanding helps store the word in the mental orthographic lexicon as reflected by spelling and literacy skills. This is especially important for children with a reading disability who rely on morpho-orthographic knowledge to spell words (Mann, 2000; Moshkovitz, 2002).

4. The characteristics of Hebrew and Arabic in the reading of punctuated and non-punctuated words

The Hebrew language belongs to the group of northwestern Semitic languages, it's one of the Cananite language dialects. This language has been spoken since the beginning of the second century B.C. in the Levant region, located today in Lebanon, Syria, Israel, and Jordan. Most of the bible books, Mishna, bible auxiliary books and the scrolls were written in Hebrew. The bible was written in biblical Hebrew but its commentary was written in a dialect called the Language of "Hazal" ל"הזל (Abbreviation in Hebrew to Our Sages, Their Memory Be Blessed).

Today Hebrew is the official and main language in Israel and Arabic has an official stand as well. English is also used extensively as is Russian and other languages. Based on the European tradition which originated with the establishment of the French Academy, there is an official authority in Israel that dictates the language standards: The Hebrew Linguistic Academy. This academic institution operates as a matter of law. It deals primarily with establishing new linguistic terms, spelling and syntax rules that become the new standards for government institutions and the public education system (Amer, 2003).

The Hebrew writing is characterized by its unique alphabet that includes 22 letters and additional graphical symbols (relatively late additions) that denotes vowels. The most distinct visual characteristic of modern Hebrew writing is the square shape of the letters. Alongside the print form of the writing, there is also the written form used for quicker writing. The latter is characterized by rounded lines and is common to handwritten texts. The origin of this hand writing form is in the Ashkenzai Jewish communities in Europe (Amer, 2003).

In all the books of the bible, poetry, and children's books, it is customary to mark vowels with punctuation and the spelling is mostly "notation style", i.e. spelling that includes only minimal use of letters as vowels. The punctuation symbols accepted for use today appear under the letters, above them or inside of them. They were created in the seventh century and used to make reading the bible easier.

The Arabic language (العربية) belongs to the southern wing of the western sematic languages. The literary Arabic (اللغة العربية الفصحى) is primarily used for official writing and communication throughout the Arab world. It plays a key role in Muslims' life because it preserves the language of the Kuraan. Alongside the literary Arabic form, there is also the written form (اللغة العربية العامية) (Abu-Rabiah, 2000).

Arabic also has a religious component: as the language of the Kuraan, it is considered the holy language of Islam. The religious belief is that God gave the Kuran to the prophet Muhammad written in Arabic. Any translated version of the Kuran is therefore considered inferior. Arabic in Islam is a language of worship and based on religious tenets, every Muslim must know the language.

Arabic is written using 28 letters and graphic symbols that represent vowels, double consonant (the equivalent of "Dagesh forte" in Hebrew: a dot in a consonant denoting that it is doubled), lack of a vowel (the equivalent of Shva in Hebrew: indicating a consonant that carries no vowel or an ultra-short vowel) and more. All the letters represent consonants, and three of them are used as vowels as well.

Arabic is written from right to left as do many sematic languages and in cursive form, that is why certain letters have different forms based on their location in the word written: the beginning, the middle, or the end. Six of the letters do not connect in cursive from the left side (their notation in Hebrew is "David Erez", abbreviated words that were formed by the combination of these six letters to make it easy to commit them to memory). In addition, certain letters have basically the same form but the punctuation distinguishes between them.

In literary Arabic (the classic, official written form) there are three vowels—a, i, u—each of them can be short or long (the long vowel is marked by the letter vowel Alef, Vav or Yod in the same order). There is also a situation of "zero vowel" (the equivalent of Shva as aforementioned in Hebrew). Unlike Hebrew, in literary Arabic, there is no "Shva Na", i.e. mobile sheva, indicating a consonant that carries an ultra-short vowel. There are no "o" and "e" sounds even though when pronouncing written literary Arabic these sounds do exist (for example: Tanwen Kasra [as follows] is pronounced as "en" and not "in") (Amer, 2003).

There is similarity between the Hebrew and Arabic languages that is reflected in the following four linguistic components:

- (1) Syntax structure: predicate—subject—object.
- (2) Intermediate tenses: future tense in Arabic also represents present tense. Sentences whose format is "And he said/will say" are common in Arabic.
- (3) Case: affixes to words designed to indicate the role of the word in the sentence.
- (4) Vocabulary: many words have similar meaning in both languages.

There are two forms of writing in both languages, the punctuated and non-punctuated. The adding of punctuation is designed to make it easier on the reader to become familiar with the proper form of reading the words. In Israel, it is common for children's books and school text books up to 2nd grade to be written with full punctuation. Starting in 3rd grade, text books are no longer punctuated with the goal of training pupils to read using the automation method.

In both Hebrew and Arabic, there is a fit between letters that represent consonants and the phoneme that are associated with them. Letters are marked with punctuation symbols that indicate precise and correct reading. Creating letter-sound connection requires the reader to master just a few rules and there is no need to read based on memorizing irregular words analogically or by rule. Knowledge of orthographic complexity is associated with the "silent" letters (letters that appear in the spelling of the word but are not pronounced) and homophonic (letters whose sound is identical) (Abu-Rabiah, 2000; Geva, Wade-Wooley, & Shany, 2005).

The punctuated Hebrew and Arabic writing systems consist of flat orthography but the fact that punctuation symbols are omitted beginning in third grade makes the orthography deeper and vaguer. The vagueness is found where a few words may share the same consonant structure but their pronunciation is completely different (Moshkovitz, 2002).

5. The correlation between phonological awareness and morphological awareness and reading ability

Many researchers examined the correlation between phonological awareness and morphological awareness and the process of acquiring the ability to read. Mann notes that awareness of morpheme must be based on phonemic awareness and syllables. In this way, the bi-directional correlation between phonology and morphology supports reading. In her research, participants were asked to produce a root word from a word pattern and they used morphological knowledge for proper phonology. It was reflected in conjugating, deriving words and reading them properly because of internal phonemic changes in the letters of these words or by adding functional letters (affixes, patterns, additions to denote male and female forms, pronoun, time and Moshe Kalev letters (abbreviation for letters in the Hebrew alphabet that can be pronounced as stressed or non-stressed). Sometimes, the same letter appears in certain words as an addition and in others, as a base word. This separation relies on how well the child has mastered the linguistic components (Mann, 2000).

The process of acquiring reading skills emphasizes the importance of phonological processing and awareness to the sounds of the words in any given language. For that purpose, an acquisition of the orthographic structure of a word is essential. It also depends on the orthographic depth, punctuated or non-punctuated words, stressed or non-stressed letters etc. The same processes that are involved in learning a first language are supposed to be involved in learning a second language because orthography influences the learning process. This characteristic is in line with the orthographic depth hypothesis. It claims that a reader's reading strategies are adapted to the language he reads (Elbro & Arnbak, 1996).

Annette Karmiloff-Smith, a well-known researcher of neuro-cognitive development, presented a theory on the repetitive process of representations. She states the development involves three stages: during the first stage, the child is primarily focused on the external environment which represents initial learning and is generated by environmental data. During the second stage, internal motivation is reflected when the child is no longer focused on external data and the internal representations become the focus of change. During the third stage, the internal representations and external data balance out and a correlation between the derive for internal and external control are accomplished. Karmiloff-Smith assumes that alongside expressive learning (knowledge that is accessible to the subject's awareness) there is implicit learning (knowledge that is not accessible to the subject's awareness). For example, learning of grammar in first language. During the process of literacy, children use the correct grammar of the first language they learn but they are not able to articulate the grammatical rules their language is based upon. Per Karmiloff-Smith, that is an example of "implicit knowledge". In social interactions, much of the knowledge is implicit as well; in many cases, children are familiar with behavior norms that suit a given social situation and behave accordingly, and yet, they cannot articulate the norms by which they operate. Adults also have explicit and implicit knowledge. When a language is used naturally, the linguistic knowledge is applied holistically and is not analyzed by its components (Ellis, 1999; Karmiloff-Smith, 2004).

Even so, it is evident that parallel to the development of implicit linguistic knowledge and accumulated experience in making various linguistic connections, analytical and explicit linguistic awareness also develops. It is termed: meta-linguistic awareness (Ravid & Tolchinsky, 2002).

At the foundation of this linguistic knowledge description is the assumption that given the right conditions, with everything connected to first language, automatic learning will occur naturally. The same assumption cannot be made in regards to a second language. Another difference between learning first and second language is the level of awareness. When a first language is acquired, the

first stages are not conscious. The acquisition of a second language can take place in two levels of awareness—low and high. At the low level, the second language is acquired implicitly, through an automatic process and without conscious actions—by being exposed to examples. At the high level, the second language is acquired explicitly, through high level of process awareness, for example, by learning the language at school (Ellis, 1999).

These differences in the level of linguistic awareness and the way it is acquired require the setting of uniform standards in analyzing performance of linguistic and meta-linguistic tasks and cognitive control. The analysis index is associated with the level of mental representation of the knowledge and cognitive control is a process of allocating attention selectively to relevant aspects while solving a problem; it is associated with operative processes. These two indices are essential to all types of tasks (Ellis, 1999; Moshkovitz, 2002).

Analysis is the cognitive ability that allows us to break a whole into its components. In the field of linguistics, this skill is reflected in breaking down linguistic units that are not analyzed into small and clear units. During this process the child learns the various linguistic components and develops an overall awareness and in-depth understanding of the existing structural representations, the syntax of a sentence structure, singular and plural forms, patterns, grammatical structures etc. Because of this process, the knowledge becomes analyzed and the child can use it creatively while paying attention to the whole and its parts. Therefore, cognitive control is the ability to control the language using practical cognitive processes.

6. Phonological awareness, morphological awareness and transfer—Transfer from first language to the learned language

The transfer of knowledge from first to second language is termed interlanguage transfer. This is one of the central subjects in the research of second language (Gass, 1998; Koda, 2001; Moshkovitz, 2002).

At the foundation of interlanguage transfer is the assumption that languages share common characteristics and universal principles. Therefore, when cognitive and meta-cognitive skills are acquired they can be transferred to other scenarios. The same process applies to linguistic and meta-linguistic skills. Knowledge that is based in first language (i.e. acquired before beginning to learn a second language) has great influence on the type and level of skills in the second language.

The research of interlanguage transfer focuses on two areas. One relates to the cognitive and meta-cognitive characteristics of the learner. A learner that exhibits certain cognitive skills in learning one language, like phonological and morphological awareness, lexicon and syntax structure, can use them in learning an additional language. Cognitive skills are transferrable from the first to the second language but if the skills that are transferred from the first to the second language are not suitable or satisfactory in dealing with that second language, difficulties arise.

The second area relates to the influence of the orthographic characteristics of the first language on the way a second language is learned. Common principles can also be applied in this area but at the same time, characteristics unique to each language and that cannot be transferred and applied to other languages must be taken into consideration.

Research in interlanguage transfer deals with many areas of linguistics: pragmatic, semantic, syntax, grammar, phonetic, phonology, and systems of writing. Findings from these researches on adults indicate that specific phonological and morphological aspects in the second language can be positively or negatively influenced by transfer from the first language (Gass, 1998; Koda, 2001; Moshkovitz, 2002).

When discussing reading a second language, the way a learner perceives the second language's method must be taken into consideration as well as its distance from the first language. Kellerman (1995), the perception of the similarity and difference between the first and second languages significantly determines the transferrable potential of linguistic elements from one language to another. In fact, this is what constitutes meta-linguistic awareness. For our purpose, both languages, Hebrew and Arabic, are sematic languages that share the same source. Therefore, meta-linguistic thinking in either one of the languages, such as knowledge of the language components and learning strategies, can be linked to understanding the linguistic system of the other language. The current research examines the transfer process and mainly, the correlation between phonological and morphological awareness in reading punctuated and non-punctuated words in the first language and reading punctuated and non-punctuated words in the second language.

7. Research questions and assumption

7.1. Research questions

- (a) Will a correlation be found between phonological and morphological awareness in the Arabic language (as a first language) and reading punctuated and non-punctuated words in Arabic?
- (b) Will a correlation be found between phonological and morphological awareness in the Hebrew language and reading punctuated and non-punctuated words in Hebrew?
- (c) Will a correlation be found between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Arabic (as first language) and phonological and morphological awareness and reading punctuated and non-punctuated words in Hebrew (as a second language)?

7.2. Research assumptions

- (1) A positive correlation will be found between phonological awareness and the reading of punctuated and non-punctuated words in the Arabic language (as a first language) and between phonological awareness and the reading of punctuated and non-punctuated words in the Hebrew language (as a second language): the higher the phonological awareness and the ability to read words in Arabic, the higher the phonological awareness in the Hebrew language and the reading of punctuated and non-punctuated words in Hebrew will be quicker and more accurate.
- (2) A positive correlation will be found between morphological awareness and the reading of punctuated and non-punctuated words in Arabic (as first language) and between morphological awareness and the reading of punctuated and non-punctuated words in Hebrew (as second language): the higher the morphological awareness in Arabic, the higher the morphological awareness in Hebrew and the reading of punctuated and non-punctuated words in Hebrew will be quicker and more accurate.

8. Participants

A sample of 30 pupils from three 4th grade classes were selected for the research. The pupils study at one of the Arabic schools in the country's central region. Their first language is Arabic and Hebrew was considered a second language. The pupils began learning the first language during first grade although their exposure, as far as phonological and morphological awareness is concerned (familiarity with the language letters and listening to children stories), has already begun in kindergarten and for some of them even earlier. The Hebrew language was minimally taught starting second grade. They were also exposed to this language at an early age by being present in public places or various events where Hebrew was predominant.

Based on teachers' reports, the pupils selected for the research exhibited thinking skills within the normal range without any visible difficulties with focus and attention, distraction, speed of executing and completing tasks. As far as language skills were concerned, their vocabulary was reasonable, they were familiar with all the letters and vowels and were well versed in reading words and short sentences.

9. Research tools

Three tools were used for the research:

- (1) *A test to examine phonological awareness*: the phonological awareness was examined using two tasks: phonemic breakdown of words and phonemic breakdown of meaningless words. The test included two lists of words, one in Arabic and the other in Hebrew. Each list consisted of 40 words, 20 meaningful words, and 20 meaningless words. The list of Arabic words was taken from Taha's work (2009), and the list of words in Hebrew was taken from a collection of relevant tests from the Hadad Center for Evaluation at the Bar Ilan University (2012).
- (2) *A test to examine morphological awareness*: the morphological awareness was also examined using two tasks: morphological production and judging morphological relationships. The test included two lists of words, one in Arabic and the other in Hebrew. Each list included 40 words, 20 words that examined the morphological production ability, and 20 words that examined the ability to judge morphological relationships. The list of words in Arabic was taken from Taha's work (2009), and the list of words in Hebrew was taken from the work of Moshkovitz (2002).
- (3) *A test that examines the reading of punctuated and non-punctuated words*: the reading of punctuated and non-punctuated words was examined using three tasks: reading of punctuated words, reading non-punctuated words and reading meaningless words. The test included two lists, one in Arabic and one in Hebrew. Each list included 90 words—30 punctuated words, 30 non-punctuated words, and 30 meaningless words. The list of words in Arabic was taken from Taha's work (2009), and the list of words in Hebrew from a collection of relevant tests given at the Hadad Center (2012). Table 1 shows the coefficients by Cronbach α value for the research scales.

From looking at Table 1 it appears that the Cronbach α values in the areas of phonological and morphological awareness in Arabic are relatively high; the coefficients of phonological and morphological awareness in Hebrew are in the average range and the coefficient of reading punctuated and non-punctuated words in Arabic and Hebrew is low.

10. Research process

The researcher met with the pupils at their school and each one of them was asked to answer questions. First, the phonological reading tasks then the morphological awareness and finally the reading of punctuated and non-punctuated words. These tasks included both languages and the reading was conducted in Arabic first (as first language) and Hebrew next (as second language).

Table 1. Cronbach α coefficients for research scales (N = 30)

Chronological number	The scale	Cronbach α coefficient
1	Phonological awareness in the Arabic language	0.74
2	Morphological awareness in the Arabic language	0.86
3	Reading of punctuated and non-punctuated words in Arabic	0.58
4	Phonological awareness in Hebrew	0.66
5	Morphological awareness in Hebrew	0.63
6	Reading of punctuated and non-punctuated words in Hebrew	0.57

- (1) *The data processing method:* this research was quantitative, comparing two languages, Arabic as a first language and Hebrew as a second language, in looking at the correlation between phonological and morphological awareness and between reading punctuated and non-punctuated words.
- (2) *The data analysis method:* the analysis of the data was performed by measuring the possible correlations between the independent variables (phonological and morphological awareness), and the dependent variable (reading punctuated and non-punctuated words in the Arabic language as first language and Hebrew as a second language) and then examined by coefficient analysis.

11. Findings

Table 2 presents averages and standard deviations of six research indices among all participants.

In looking at Table 2, we find that the index average “reading punctuated and non-punctuated words” in Arabic was the highest (average of 26.90 and standard deviation of 2.26), next is the index “average reading punctuated and non-punctuated words in Hebrew” (average 25.56, and standard deviation 0.28). The index average “phonological awareness in Hebrew” was the lowest (average 15.48, standard deviation 0.48).

Tables 3 and 4 present Pearson coefficients between phonological awareness and morphological awareness and between reading punctuated and non-punctuated words, in Arabic as a first language (Table 3) and Hebrew as a second language (Table 4).

In looking at Table 3 we find that in line with the first research assumption, a significant positive correlation was found between phonological awareness and the reading of punctuated and non-punctuated words in Arabic as a first language. No significant correlation was found between morphological awareness and the reading of punctuated and non-punctuated words in Arabic.

Table 2. Averages and standard deviations of six research indices among all participants (N = 30)

Chronological number	Name of the field	Average	Standard deviation
1	Phonological awareness in Arabic	16.45	0.23
2	Morphological awareness in Arabic	18.38	0.05
3	Reading punctuated and non-punctuated words in Arabic	26.90	2.26
4	Phonological awareness in Hebrew	15.48	0.48
5	Morphological awareness in Hebrew	16.78	0.32
6	Reading punctuated and non-punctuated words in Hebrew	25.56	0.28

Table 3. Pearson coefficients between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Arabic as a first language (N = 30)

	Reading punctuated and non-punctuated words in Arabic
Phonological awareness	0.46**
Morphological awareness	0.09

**Significance level at $p < 0.01$.

Table 4. Pearson coefficients between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Hebrew as a second language (N = 30)

	Reading punctuated and non-punctuated words in Arabic
Phonological awareness	0.65**
Morphological awareness	0.37*

*Significance level at $p < 0.05$.

**Significance level at $p < 0.01$.

Table 5. Pearson coefficients between phonological awareness, morphological awareness and the reading of punctuated and non-punctuated words in both languages, Arabic and Hebrew (N = 30)

Area of examination	Pearson coefficient
Phonological awareness in Arabic and Hebrew	0.71**
Morphological awareness in Arabic and Hebrew	0.28
Reading punctuated and non-punctuated words in Arabic and Hebrew	0.53**
Phonological awareness in Arabic and the reading of words in Hebrew	0.56**
Morphological awareness in Arabic and reading words in Hebrew	0.03

**Significance level at $p < 0.01$.

In looking at Table 4 we find that in response to the second research question, significant positive correlations exist between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Hebrew as a second language.

Table 5 presents Pearson coefficients between phonological awareness, morphological awareness and the reading of punctuated and non-punctuated words in Arabic as first language and Hebrew as second language.

In looking at Table 5 we find that in line with the first research assumption, a significant positive correlation was found between phonological awareness in Arabic (as first language) and phonological awareness in Hebrew (as second language). Also, in line with the assumption, a significant positive correlation was found between reading punctuated and non-punctuated words in Arabic (as first language) and reading punctuated and non-punctuated words in Hebrew (as second language). A significant positive correlation was found between phonological awareness in Arabic (as first language) and reading punctuated and non-punctuated words in Hebrew (as second language).

From looking at Table 5 we also see that, as opposed to the second research assumption, there was no correlation between morphological awareness in Arabic (as first language) and morphological awareness in Hebrew (as second language). In addition, no correlation was found between morphological awareness in Arabic (as first language) and reading punctuated and non-punctuated words in Hebrew (as second language).

12. Discussion and conclusions

The main purpose of this research was to examine the correlation between phonological awareness and morphological awareness and acquiring reading skills of punctuated and non-punctuated words in Arabic as first language and Hebrew as second language. Through a field study and in this context, the following aspects were examined:

- (a) Will a correlation be found between phonological and morphological awareness in Arabic (as first language) and the reading of punctuated and non-punctuated words in Arabic?
- (b) Will a correlation be found between phonological and morphological awareness in Hebrew (as second language) and the reading of punctuated and non-punctuated words in Hebrew?
- (c) Will a correlation be found between phonological and morphological awareness and the reading of punctuated and non-punctuated words in Arabic (as first language) and phonological and morphological awareness and the reading of punctuated and non-punctuated words in Hebrew (as second language).

The first research assumption was that a positive correlation will be found between phonological awareness and reading of punctuated and non-punctuated words in Arabic (as first language) and phonological awareness and the reading of punctuated and non-punctuated words in Hebrew (as second language). In other words, the higher the phonological awareness and the reading of words in Arabic, the higher the phonological awareness in Hebrew and the reading of punctuated and non-punctuated words in Hebrew will be quicker and more accurate.

The pattern of the findings indicated that this assumption was confirmed and phonological awareness is correlated with the development of reading in both languages.

Phonological awareness is the ability to relate to the sounds of a word; it is an essential component of acquiring the ability to read. Before a child learns about letters, he must understand that these letters represent significant sounds in any given language and that these sounds can form a word when put together (Moshkovitz, 2002). The phonological awareness is reflected in the ability to rhyme, identify repetitive sound patterns, break down words into syllables, and merge syllables into sounds and words. The development of phonological awareness begins in kindergarten where children are first exposed to reading and then intensifies in elementary school when the child is required to take on reading in general. In other words, phonological awareness supports a proper reading process and influences the development of phonological awareness (Moshkovitz, 2002; Taha, 2009). Additional researchers noted that acquisition of language influences the development of phonological representations, sound and recognition awareness of different phoneme (Ziegler & Goswami, 2005).

Researches regarding transfer dealt with investigating the transfer within pragmatics, semantics, syntax, grammar, phonetic, phonology and systems of writing. Findings from research on adults indicate that specific aspects of phonology and morphology in second language may be positively or negatively influenced by the transfer from first language (Gass, 1998; Koda, 2001; Moshkovitz, 2002).

The second research assumption was that there will be a positive correlation between morphological awareness and the reading of punctuated and non-punctuated words in Arabic (as first language) and morphological awareness and reading of punctuated and non-punctuated words in Hebrew (as second language). In other words, the higher the morphological awareness in Arabic, the higher the morphological awareness in Hebrew, and reading of punctuated and non-punctuated words in Hebrew will be quicker and more accurate.

The pattern of the findings indicated that this assumption was confirmed and morphological awareness was correlated with the development of reading in both Arabic and Hebrew, but in Arabic, the correlation was not as significant.

Morphology (the theory of shapes) deals with the correlation between sound combination and the meaning they represent. Morphological awareness is the ability to get familiar with the internal structure of words and relate to its components. Most of the words in Arabic and Hebrew are a combination of integrated phoneme—a root phoneme that denotes the basic meaning of the word and a structural phoneme that varies the meaning (Rom et al., 2005).

Morphology is related to reading and this fact is reflected in a child's ability to analyze words and their morphological components to produce meaning (Ben-Dror et al., 2003). Mastering word morphology supports proper access to the mental lexicon. In other words, the ability to identify the core structure of a word, separate it from its affixes and by doing that, search for its proper location "inside the lexicon". Measuring morphological awareness by assigning derivative morphological tasks in kindergarten was a reliable predictor of reading comprehension skills in second grade (Carlisle, 2000; Moshkovitz, 2002; Taha, 2009).

Good mastery of first language as in morphological awareness, linguistic meta-cognitive and cognitive knowledge, can be relevant when acquiring a second language. Based on the findings of our research, high level of morphological awareness in the first language (Arabic) is correlated with reading quick and more accurately in the second language (Hebrew).

13. Conclusions and recommendations

Within the scope of the current research, we examined the correlation between phonological awareness and reading punctuated and non-punctuated words in the Arabic language (as first language) and between phonological awareness and the reading of punctuated and non-punctuated words in the Hebrew (as second language). We found that the higher the phonological awareness in reading punctuated and non-punctuated words in Arabic the quicker and more accurate the reading of punctuated and non-punctuated words in Hebrew.

It is therefore recommended that schools put emphasis on developing a curriculum that focuses on improving phonological awareness when teaching reading skills in elementary school. The proposed curriculum will be directed at developing the child's ability to perform graphic-phonemic decoding, use phonemic conversion rules, break down words into syllables and merge syllables into sounds and words. Our research found that children that were exposed to these processes developed their reading skills in Arabic (as first language) as well as in Hebrew (as second language).

Our research also examined the correlation between morphological awareness in reading punctuated and non-punctuated words in Arabic (as first language) and morphological awareness in reading punctuated and non-punctuated words in Hebrew (as second language). The findings indicated that morphological awareness is correlated with reading development in both languages but was less significant in Arabic.

Our recommendation in this case is the same, that schools put an emphasis on developing morphological awareness when teaching reading skills by focusing on word component and their roles (pattern, root, structure, affixes etc.), the internal structure of words and the rules used to create more complex words. Developing these processes among children when they begin acquiring their reading skills may contribute to faster and more accurate reading.

14. The research limitations and suggestions for additional research

As in all research of this type there are various limitations. The following lists these limitations and with them, suggestions for additional research on the subject:

- (1) The research separated the variables: phonological and morphological awareness as independent variables and reading punctuated and non-punctuated words as a dependent variable. It will be interesting to examine another structure of the variables or to use additional variables such as: word lexicon, syntax, or orthographic structure.
- (2) The research focused on examining Arab children whose first language is Arabic; the findings therefore cannot be generalized to include the education system. Researching various populations that speak different languages, among them Hebrew as a first language, is highly recommended, to ascertain that transfer from first to second language indeed "works".

- (3) The research focused on pupils only. Additional factors in the education system were not examined. For example: pedagogical trainers, supervisors, education department administrators in local municipalities, or parents to investigate whether there are additional factors that influence the development of reading among pupils outside of transfer from first to second language.
- (4) The primary method used in this research is quantitative. Using qualitative research may prove beneficial by allowing a wider view of the phonological and morphological awareness on reading punctuated and non-punctuated words among pupils.
- (5) The research was conducted in one school only. Additional research should include several schools to increase the generalization factor of the research findings.
- (6) Additional research may include supervising the academic achievements of the pupils participating because this variable may have an impact on the pattern of the finding.

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Author details

Saied Bishara^{1,2,3}

E-mail: saied@beitberl.ac.il

ORCID ID: <http://orcid.org/0000-0003-0448-1123>

Itzhak Weiss⁴

E-mail: itzhak.weiss10@gmail.com

¹ Department of Special Education, Beit Berl College, Beit Berl, Israel.

² Department of Special Education, Al-Qasemi College, Baqa-Elqarbia, Israel.

³ Department of Education and Psychology, Open University, Ra'anana, Israel.

⁴ School of Education, Bar Ilan University, Ramat Gan, Israel.

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