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THE RELATIONSHIP BETWEEN PHONOLOGICAL AWARENESS AND WORD READING

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ABSTRACT

This study investigates the effect of phonological awareness instruction on the development of word-reading ability for EFL first-graders in a Jordanian state school. Based on Chard and Dickson's (1999) phonological awareness hierarchy, a phonological awareness training program was developed by the researchers, and used in training the experimental group whose children after 10 training sessions significantly outperformed their peers in the control group on TampaReads' (2003) word-reading measures. The study concludes that phonological awareness is relevant to the development of first-graders' word-reading ability, and that explicit phonological awareness instruction is essential for this development. The study thus provides support to previous research, and implies that phonological awareness can be taught contrary to the notion of the pure whole language approach, and that explicit phonological awareness intervention can help overcome the Jordanian EFL children's reading problems once it is systematically integrated into their school curricula.

KEYWORDS: Phonological awareness; phonemic awareness; word-reading; phonological awareness instruction.

1. Introduction

Arab learners of English as a foreign language experience different types of problems and difficulties at word level while reading English texts (Brown and Haynes 1985; Ryan and Meara 1991). More specifically, they, according to Fender (2003), seem to have difficulty with prelexical word recognition processes; i.e. the ability to identify the printed (orthographic) form of a word or lexical item in order to activate the word's meaning, structural/syntactic information, and other pragmatic or word knowledge as-

sociations. These processes operate at a prelexical stage and are necessary to identify and activate a word or a lexical item (Siedenberg 1992; Vellutino et al. 1994), and knowledge of them is crucial for foreign language reading fluency and comprehension (MacDonald 2000).

Considerable research has emphasized the relevance of phonological awareness (i.e. the metalinguistic ability to manipulate sub-word phonological elements) to reading acquisition (e.g. Lundberg et al. 1988; Gillet et al. 2004; Anthony and Francis 2005). This research has already established that phonological awareness is a pre-reading skill or a prerequisite for learning to read. According to Sensenbaugh (2000), it is the best predictor of the ease of early reading acquisition, better than IQ, vocabulary and listening comprehension. In the same vein, Anthony and Francis (2005: 255) contend that this relation is "evident in all alphabetic languages studied to date." This has been confirmed in a number of studies including, for instance, English, French, Spanish, Italian, Greek, and Punjabi as tackled from monolingual and/or bilingual perspectives (see Section 3).

In the context of aspiring to become bilinguals, Arab learners of English as a foreign language have not been thus far, to our knowledge, the subject of such investigation, and this constitutes the rationale behind conducting the present research. English is taught as a foreign language in almost all Arab countries. In Jordan, for example, according to King Abdullah II's National Initiative of 1999, English is simultaneously taught as a mandatory module right from the first grade in both state and private schools. Jordanian children are gradually required to become proficient in English basic skills including reading. By the end of the year, first graders are expected to "read English from left to right, and show understanding of learned simple words about names, objects, actions, and numbers when reading through different activities" (The English Language National Team 2006: 17).

However, the mainstream Jordanian first graders often struggle when they attend to these basic skills, and this can be attributed to their impoverished phonological awareness of English, which, in turn, might be related to L1 interference. The English phonological system is less consistent and transparent than that of Arabic (Wagner et al. 1993; Abu Rabia 1999). Moreover, there are basic orthographical differences between both systems. According to Fender (2003), the English orthography encodes a large amount of phonological information through grapheme-phoneme correspondence rules, though English has many inconsistencies with regard to how vowels are represented in the orthography as well as a variety of context-sensitive grapheme-phoneme irregularities (cf. Berent and Perfetti 1995). Arabic, on the other hand, uses an alphabetic system that encodes language at the level of phonemes; hence graphemes (i.e. letters) closely correspond to consonant and vowel phonemes (Fender 2003). This, according to Abu Rabia (1997), facilitates their L1 word recognition, developed through dependence on L1 phonological processing skills (see Section 2 below).

It is on these native skills developed through L1 literacy experience that Jordanian EFL children tend to rely when reading English words in texts and in isolation, and this, according to Fender (2003: 294), leads to "a slower and perhaps even less accurate

[EFL] word recognition". It is rather dependence on English phonological processing skills themselves, including phonological awareness of English, that is expected to develop their English word recognition (cf. Gough and Walsh, 1991; Perfetti, 1991). Thus, in order to obtain a quicker and a more accurate EFL word recognition, more attention has to be given to developing the Jordanian children's phonological awareness of English. This can be arguably done through explicit phonological instruction (e.g. Snow et al. 1998; Ball and Blachman 1991) which poses challenges to the pure whole language argument that phonological awareness is only truly naturally acquired (e.g. Foorman and Liberman 1989).

Thus, the purpose of the present paper is to test the hypothesis that explicit phonological awareness instruction can have positive impact on Jordanian first-graders' English word- reading. If this were true, two important implications could be obtained. The first is theoretical that has to do with corroborating the notion of learnability of phonological awareness, and the second is pedagogical related to the utility of integrating phonological awareness training into EFL children's curricula in Jordanian state and private schools.

2. Phonological awareness

Research has revealed three interconnected phonological processing abilities required for reading acquisition, viz. phonological memory, phonological access to lexical storage and phonological awareness, defined by Anthony and Francis (2005: 255) as follows: phonological memory refers to "coding information in a sound-based representation system for temporary storage", phonological access to lexical storage points to "the efficiency of retrieving phonological codes from memory", and phonological awareness indicates "one's degree of sensitivity to the sound structure of oral language". Amongst these skills, as will be shown in Section 3 below, phonological awareness is the component most strongly connected to the ability to read (i.e. knowing the Alphabetic Principle: a written symbol corresponding to a phoneme, cf. Perfetti et al. 1987, 1991), and hence receiving special attention in this study.

Awareness, "Sensitivity" (Anthony and Francis 2005), or "consciousness" (Gillet et al. 2004: 220) of oral sound structure generally involves one's ability to recognize, discriminate, and manipulate the oral sound. As the later two alternatives have not yet gained currency in the literature, "awareness" will continue to be used in this study (see Stanovich 1986, 1992, 1993; and Read 1991 for an argument). Consistent with Sensenbaugh (2000), preference will also be given in this work to "phonological awareness" over "phonemic awareness", since the former term refers to an awareness that words consist of syllables, onsets and rimes, and phonemes, and so can be considered as a broader notion than the latter.

Phonological awareness, according to Olofsson and Niedersoe (1999), typically begins during preschool years, when children with normal hearing can attend to ambient

sounds by naming, imitating and describing them. A number of tests are normally used to measure this awareness. (See Section 4 below.)

3. Review of related literature

The relationship between phonological awareness and the ability to read has received much research concern. Based on the levels of phonological awareness assessed, and empirical evidence, research work reveals three different, though interrelated, correlations: first, reciprocity (e.g. Stanovich 1987; Perfetti et al. 1987); second, phonological awareness as a by-product of reading development (e.g. Morais et al. 1987; Gillis and De Schutter 1996); and third, phonological awareness as a precursor skill to successful reading acquisition as evidenced below.

A huge body of research has already established that phonological awareness is one of the most powerful skills that predict later reading success amongst students (e.g. Lundberg et al. 1988; Shapley 2001; Gillet et al. 2004; Anthony and Francis 2005). According to Shapley (2001: 8),

> Before children learn to read print, they must become aware of how sounds work in words. This includes identifying beginning, medial and ending sounds, hearing rhythm and rhymes, and understanding nuances in spoken words.

Similarly, Gillet et al. (2004: 206) contend:

> [...] being aware of speech sounds helped apprentice readers attend to the relationships between sounds and letters, and learning letter-to-sound correspondences made it possible to recognize more and more words.

As mentioned earlier, the correlation between phonological awareness and the ability to read is claimed to be "evident in all alphabetic languages studied to date" (Anthony and Francis 2005: 255).

Most studies on phonological awareness concentrate on monolingual children despite the predominance of bilingualism in the world's population (Romaine 1999). However, there is a growing research interest in bilingual children (e.g. English-French (Bruck et al. 1997); English-Spanish (Durgunoglu et al. 1993); English-Italian (Campbell and Sais 1995); English-Punjabi (Stuart-Smith and Martin 1999); English-Greek (Leafstedt et al. 2004)). Such studies compare phonological awareness in monolingual and bilingual[1] children by testing either one or both of the bilingual child's languages. They also provide evidence in favor of the relevance of phonological awareness to reading.

[1] It should be noted that the term "bilingual" in such works has been used rather loosely to designate any child exposed to more than one language (Leafstedt et al. 2004). Following them, we have used the term in this sense in the present study with the implicit knowledge that such children can be best described as learners of an additional language.

Arabic, though alphabetic, has not received, to our knowledge, such research attention from either a monolingual or bilingual perspective. Because of the distinguished status of English as a world language, it is taught as a foreign language in almost all Arab countries (for a review, see Rabab'ah 2005). In Jordan, there is probably an exceptional concern represented, as stated above, by King Abdullah II's National Initiative of 1999 that imposes teaching English as a foreign language right from the elementary stage in both state and private schools. For many reasons possibly related to L1 interference and lack of attention to the notion of phonological awareness in the Jordanian curricula, Jordanian EFL first graders experience English word reading problems in the manner described by Brown and Hyness (1985); Ryan and Meara (1991) and Fender (2003). In fact, by the end of the year, the mainstream Jordanian EFL first graders stop short of meeting the expectations of The English Language National Team (2006: 17) with respect to English word reading. This calls for considering all possible means to help those children develop their English reading ability.

Explicit instruction in phonological awareness is reported in the literature to serve as a remedial procedure. The National Reading Panel's 1998 report to the US Congress strongly advocates "helping children hear sounds in words, know the letters of the alphabet, know letter-to-sound correspondences, and be able to read words" (Snow et al. 1998: 5). Based on 52 experimental studies, the 2000 report confirms the previous one and concludes that phonological awareness instruction has "moderate and statistically significant effects on reading and spelling abilities, and that explicit instruction is beneficial for typically developing children, for young children at risk for reading difficulties, and for poor readers" (Anthony and Francis 2005: 255).

Moreover, Lundberg et al. (1988) investigate the effect of phonological intervention on developing the English reading ability for a number of Scandinavian children. The experimental group (children participating in a pre-school phonological training program) outperformed the control group on measures of single-word reading. Results of post-intervention testing suggest the utility of training in developing awareness of single phonemes leading, according to the authors, to the emergence of alphabetic skills, which in turn account for the subsequent superiority of the experimental group. Similar conclusions were drawn by Ball and Blachman (1991), Ehri et al. (2001), Vaughn et al. (2001) and Littleton et al. (2006).

Based on this amount of evidence, it may be predicted that Jordanian EFL first graders need an explicit phonological awareness instruction in order to improve their reading abilities.

4. Methodology

4.1. Subjects

The study was conducted in Judeita Basic School for Boys at Al-Korah District, a rural area in the North of Jordan. This school is just like thousands of state schools distrib-

uted across the country and run by the Ministry of Education. Generally, Jordanian families that cannot afford private education send their children to such schools. There is no particular reason for choosing this school, except for its being the largest educational hub in the area. However, the results obtained from this school can be generalizable given that the curricula adopted for first-graders are the same in all state schools in Jordan, not to mention obvious similarity in teachers' qualifications, schools' facilities, and parents' socio-economic status.

One hundred forty-five male students from this school, where English is taught as a foreign language, formed the population of this study. The school has six first-grade classes. One class, consisting of 30 students, was assigned to the control group, and another class, comprising 31 students, to the experimental group. Following Ehri et al. (2001) and Vaughn et al. (2001), the experimental group was divided into 6 sub-groups, each comprising 5 students in order to facilitate conducting the intended training sessions, and to make the training process itself most beneficial.

In Jordan, first-graders normally join schools at the age of 6 and, as mentioned above, they start learning English right from this basic stage. After 8 months of schooling and nearly a month towards the end of the year, the children in both groups sat for a word-reading pre-test (see assessment procedures below), and by then their age mean was 6.8 years.

4.2. Assessment procedures

4.2.1. Pre-post word reading test

Pre and post-test procedures were adopted in the present research. English word-reading ability was assessed using Grade 1 National Reading Vocabulary developed by TampaReads (2003). In this test, students were asked to read a list of letters and a list of 340 real words of increasing difficulty selected by TampaReads as words which Grade 1 students need to master by the end of the school year. According to TampaReads, students who achieve this goal will be reading at approximately a 2.0 grade level and typically score in the top 10% on standardized national reading tests such as the Stanford Achievement Test (SAT) or Woodcock-Johnson.

In this research, each student in both pre and post word-reading tests was asked to read as many words from the list as he could. The task administration was discontinued when 10 consecutive words were read incorrectly. The number of correctly decoded words determined students' reading accuracy of the 340 real words. The raw score of the word-reading test was 100. Sample words of increasing difficulty included *red*, *bus*, *we*, *she*, *play*, *pretty*, *thumb*, *mother*, *doesn't*, *white*, *because*, *tomorrow*, *brown*, *gray*, *while*, *wrong*, and *beautiful*.

A week before phonological awareness sessions were held for the experimental group, a pre-reading test was administered to both groups to determine the children's

English word-reading ability and to find significant differences (if any) between the two groups. The pre-test results showed that there were no significant differences between both groups. Thus, any later differences between the mean scores of the experimental and control groups expected to be found in the post-test results could be attributed to phonological awareness instruction. The pre-test was administered during the last month of the second semester of 2006. Using TampaReads (2003), the students were tested one by one in a quiet room and under a friendly atmosphere by their experienced bilingual teacher (see below) who himself had already received training on phonological awareness and testing from the researchers.

Following the pre-test, the phonological awareness training program (see below) was run for the experimental group by this teacher. Meanwhile, the students in the control group continued to receive regular English classes. Immediately after the end of the training program, both groups sat for the word-reading post-test (TampaReads, 2003). Testing procedures were identical for both groups in both pre- and post-tests.

4.2.2. Phonological awareness training program

After the word-reading pre-test, the students in the experimental group underwent ten 40-minute sessions of phonological awareness training carried out by a Jordanian senior English language teacher who holds a bachelor degree in English language and literature and who has been teaching English as a foreign language at state schools for thirteen years now. The sessions were held over two weeks (five sessions a week), and in each the students were explicitly taught phonological awareness using the training material developed by the researchers based on Chard and Dickson's (1999) phonological awareness guidelines which suggest a continuum of complexity of phonological awareness activities ranging from rhyming and rhyming songs to phonemic awareness, as outlined below. For further details, see the Appendix.

4.2.3. Level 1: Initial rhyme and rhyming songs

Since Chard and Dickson's model considers rhymes as an earlier developing skill, the children in the experimental group first listened to some rhyming songs (e.g. *Ten Little Monkeys*) and practiced signing them. They were also given two tasks of rhyme practice where each consists of ten items. In task 1, following an example, they were requested to identify, from among three words, the one that rhymes with the target stimulus. For instance, they were asked, "Which word rimes with *dig*" (*cook*, *book*, *big*), and told "The word *big* rhymes with *dig*". In task 2, they were asked to identify, from among three options, the two words that rhyme. For example, they were asked, "Which two words rhyme *date*, *far*, *late*?, and they were answered "*date* and *late*".

4.2.4. Level 2: Sentence segmentation

Sentence segmentation shows the students' awareness of the fact that speech can be broken down into individual words. Thus, the children were taught how to segment sentences into individual words; hence *Ali is my friend* is composed of four words, viz., *Ali*, *is*, *my*, and *friend*. Since songs are recommended for this matter at this stage, the children were given a song retrieved from www.thedonkeysanctuary.org.uk, and another extracted from their textbook (*Action Pack 1).* They enjoyed listening to these songs and started to sing them before they practiced breaking each up into its single word constituents.

4.2.5. Level 3: Syllable segmentation and blending

At the center of Chard and Dickson's continuum are activities related to segmenting words into syllables and blending syllables into words. The students were trained on these activities through two main tasks. In task 1, they were taught that words consist of syllables (e.g. *winter*: *win-ter*), shown pictures of 20 words, and asked to syllabify these words. In task 2, they were trained on blending following this example: "I say the word as syllables, you blend them to make the words. If I say the word *can-dy* like a robot, you say it fast as *candy*". Then again, they were shown pictures of 20 different words, and as pronounced by the teacher, they were asked to make words out of their syllables.

4.2.6. Level 4: Onset-rime, blending and segmentation

Next in Richard and Dickson's hierarchy comes segmenting words into onsets and rimes, and blending onsets and rimes into words. Training the children on these activities required three important tasks. Task 1: recognizing onset (e.g. the children were asked, "Say which sound is the onset in *fall*?" and answered: "The onset is *f*"). Then, they were instructed to tell the onsets of 20 words demonstrated in pictures. Task 2: identifying rime (e.g. "Say which sound is the rime in *fall*?" "The rime is *all*"). Then they were asked to tell the rimes of 20 picture-illustrated words. Task 3: blending onsets and rimes: They were told, "If you blend the onset *c* and the rime *ar*, you will have *car*". Then they were asked to blend the onsets and rimes of 20 pictured-words.

4.2.7. Level 5: Segmenting and blending individual phonemes

Phonemic awareness (as part of phonological awareness) is the understanding that words are made up of individual phonemes, and the ability to manipulate these pho-

nemes as judged by segmenting and blending. As such, it is considered a late developing phonological skill (see Section 2 above). According to Chard and Dickson (1999), phonemic awareness is the most important and sophisticated level of phonological awareness. In order to train the children on phoneme segmentation and blending, two tasks were carried out. In task 1, they were taught how to segment words into phonemes (e.g. "If I say *old*, you should say /o/, /l/, /d/"). In task 2, they were asked to blend phonemes into words (e.g. "If I say the word slowly, say it fast. If I say *Mmmmm aaaaaa nnnnnn*, you say *man*"). For practice, 20 words were used in each task, along with picture cards to facilitate comprehension.

The first-graders of the experimental group enjoyed the phonological training material as presented above, and no one was reported to cut out any of the ten phonological awareness sessions which lasted for about 400 minutes over the two weeks. Each phonological level required two sessions, each of which necessitated the completion of two pertinent phonological tasks. As such, our training program is consistent with Ehri et al.'s (2001) view of effective intervention.

The progress of the training program was monitored by the researchers through their frequent visits to the school and their continuous contact with the experimental group teacher.

4.2.8. Reliability and validity of research instruments

TampaReads' (2003) word-reading test adopted in the present research is one of the internationally standardized reading tests; and hence its validity and reliability are already established. But to maximize the validity of the phonological awareness material developed by the researchers following Chard and Dickson's (1999) model, it was referred to a jury including three professors of phonetics and phonology, and three senior English language supervisors at the Jordanian Ministry of Education. Feedback and recommendations as to the phonological awareness activities scheduled in the program were taken into consideration in rewriting the tasks discussed above.

5. Results and Discussion

In this section, we demonstrate the results obtained from both control and experimental groups and find out the relevance of explicit phonological awareness instruction to the development of the Jordanian EFL children's word-reading ability.

The results of the word-reading pre-test administered for the first-graders in both groups at the beginning of the school year are shown in Ttable 1 below.

Table 1. Results of word-reading ore-test for both groups

Group	N	Mean	Std. Deviation	T	P
Experimental	31	19.54	10.8837	.059	.053
Control	30	19.40	8.5484		

As expected, the table reveals no significant differences in the mean scores of the two groups in word-reading before conducting the experiment (t = .059, P = .953). Therefore, any significant differences to be detected after the treatment will be attributed to the effect of phonological awareness training.

The results also demonstrate an obvious weakness in the children's word-reading ability (mean score around 19.50/100), and this lends some support to the findings of Brown and Hyness (1985) and Ryan and Meara (1991) regarding noticeable reading problems and difficulties encountered by Arab learners of English, and corroborates Fender's (2003) conclusion that Arab EFL children face difficulties with word recognition processes. One may argue that the results are not surprising given that the word-reading pre-test was administered only after eight months of the children's first-hand experience with English as a foreign language. However, the results remain far below the expectations of the Jordanian Ministry of Education, as those children are anticipated by the end of first grade to "read English" and "show understanding of learned simple words" (The English Language National Team, 2006: 17).

Phonological awareness instruction prescribed in the literature as a remedy to reading problems seems to work well with the children in the experimental group. Table (2) below illustrates the mean scores and standard deviations for word-reading post-test calculated for both groups using t-test.

Table 2. Results of word-reading post-test for both groups

Group	N	Mean	Std. Deviation	T	P
Experimental	31	29.16	12.4179	3.493	.001
Control	30	19.60	8.6924		

The experimental group, as is obvious in Table 2, demonstrates higher mean score in the word-reading post-test (29.16) than the control group (19. 60), and the t-test analysis denotes significant differences (t = 3.493, P = .001) in favor of the experimental group. Bearing in mind the similar results found for both groups in the word-reading pre-test (Table 1), we can only attribute the relative superiority of the experimental group (though still far below the expectations of TampaReads, 2003) to the explicit phono-

logical awareness instruction they had received. Though the mean score of the experimental group is still relatively low (and this again provides further support to Brown and Hyness (1985); Ryan and Meara (1991); and Fender (2003)), it nonetheless indicates a noticeable development in the group's reading ability. This becomes clearer when we compare the experimental group results in both pre and post word-reading tests based on Table 3 below:

Table 3. The experimental groups' results in both pre- and post- word-reading tests

Test	N	Mean	Std. Deviation	T	P
Experimental	31	19.54	10.8837	3.241	.002
Control	30	29.16	12.4179		

Distinctly, while the experimental group mean score was 19.54 in the word-reading pre-test it has increased up to 29.16 in the word-reading post-test, pointing to a significant difference in the children's reading ability ($t = 3.241$, $P = .002$). This noteworthy progress reflects the utility of the group's phonological awareness program, and seems to reveal the shortcomings of the English ordinary teaching approach practiced in Jordanian state schools that disregards phonological awareness training and its significance to the development of reading ability. This can be concluded from the control group results in both pre and post word-reading tests summarized in Table 4:

Table 4. The control group's results in both pre- and post- word-reading tests

Test	N	Mean	Std. Deviation	T	Sig.
Experimental	30	19.64	8.6924	.090	.929
Control	30	29.40	8.5484		

It is obvious from this table that the control group has not made any advancement in both word-reading tests as their mean scores in both tests are almost identical; and hence, there are no significant differences in their reading ability ($t = .090$, $P = .929$).

Two main conclusions can be immediately drawn from the four tables given above: (a) phonological awareness is relevant to the development of word-reading ability for Jordanian EFL first-graders; and (b) explicit phonological awareness instruction is of paramount importance to this development. Both conclusions provide support to already available research along these lines. The first, on one hand, is consistent with the causal view that phonological awareness is a "pre-reading skill" (Shapley 2001: 8), and

is one of the most powerful predictors of later reading success (e.g. Lundberg et al. 1988; Gillet et al. 2004). It is also congruent with Anthony and Francis' (2005: 255) observation that the correlation between phonological awareness and the ability to read is "evident in all alphabetic languages studied to date". Moreover, the relevance of phonological awareness to reading as evidenced for our to-be Arabic-English bilingual children provides some support to previous conclusions drawn from bilingual children of other languages e.g. English-French, English-Spanish, English-Italian, English-Greek, and English-Punjabi, as documented above.

The second, on the other hand, corroborates previous results emphasizing the utility of phonological awareness intervention for reading development, notably that of the National Reading Panel's 1998 report to the US Congress advocating "helping children hear sounds in words, know the letters of the alphabet, know letter-to-sound correspondences, and be able to read words" (Snow et al. 1998: 5); and that of the 2000 one considering phonological awareness intervention as having:

> Moderate and statistically significant effects on reading [...], and that explicit instruction is beneficial for typically developing children, for young children at risk for reading difficulties, and for poor readers (Anthony and Francis 2005: 255).

The usefulness of phonological awareness instruction concluded in the present research also lends support to Lundberg et al.'s (1988) findings of superior performance in English single-word-reading for their Scandinavian children who underwent a pre-school phonological training program. It, moreover, confirms many results to this effect obtained by a number of scholars (e.g. Ball and Blachman 1991; Ehri et al. 2001; Vaughn et al. 2001; Wood 2005; Littleton et al. 2006). Furthermore, it corroborates Leafstedt et al.'s (2004: 253) claim that "intervention that is effective for monolingual students may be similarly effective for EL students", and some previous conclusions drawn by Chiappe et al. (2002).

Having provided evidence in favor of the relevance of explicit phonological awareness instruction to Jordanian EFL first-graders' word-reading, and thus confirming our research hypothesis, it would be interesting to consider two important implications. The first is theoretical suggesting that phonological awareness can be taught; and hence the learnability view advocated by some scholars (e.g. Snow et al. 1998; Ball and Blachman 1991) is supported in the present research. Conversely, there is no support to the pure whole language approach that phonological awareness is only truly naturally acquired (e.g. Foorman and Liberman 1989). However, the combination of both notions (i.e. explicit phonological awareness intervention and whole language instruction) as viewed by Joslin (1994) and Sensenbaugh (1996) seems to be more appealing and beneficial for the development of reading ability.

Based on this, the second implication is pedagogical suggesting that explicit phonological awareness instruction be integrated in Jordanian EFL children's curricula right

from the first-grade, especially since the experimental group has shown a noticeable advancement in English word-reading ability. This can help improve this ability for the first-graders, and make it possible for them to meet the expectations of the Jordanian Ministry of Education as set up by The English Language National Team (2006). It is also implied here that a systematic incorporation of phonological awareness programs into the curricula of the basic school stages (i.e. Grades 1–6) will eventually form a stronger phonological background that helps the children overcome their documented reading difficulties. Prudent strategies for this integration should consider the level of phonological awareness required at each school stage (Chard and Dickson 1999) and the degree of explicitness needed (Smith et al. 1998).

REFERENCES

Abu Rabia, S. 1997. "Reading in Arabic orthography: The effect of vowels and context on reading accuracy of poor and skilled native Arabic readers". *Reading and Writing: An Interdisciplinary Journal* 9. 65–78.

Abu Rabia, S. 1999. "The effect of Arabic vowels on the reading comprehension of second- and sixth-grade native Arab children". *Journal of Psycholinguistic Research* 28. 39–101.

Anthony, L. and D. Francis. 2005. "Development of phonological awareness." *American Psychological Society* 14(5). 255–258.

Ball, E. W. and B. A. Blachman. 1991. "Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling?" *Reading Research Quarterly* 25. 49–66.

Barrett, M. (ed.). 1999. *The development of language*. Hove: Psychology Press.

Berent, I. and C. Perfetti. 1995. "A rose is a REEZ: The two-cycles model of phonology assembly in reading English". *Psychological Review* 102. 146–184.

Bradley, L. and P.E. Bryant. 1983. "Categorizing sounds and learning to read: A causal connection". *Nature* 30. 419–421.

Brady, S. and D. Shankweiler (eds.). 1991. *Phonological processes in literacy.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Brown, T. L. and M. Haynes. 1985. "Literacy background and reading development in a second language". In Carr, T.H. (ed.). 91–34.

Bruck, M., F. Genesee and M. Caravolas. 1997. "A cross-linguistic study of early literacy acquisition". In Blachman, B. (ed.), *Foundations of reading acquisition and dyslexia: Implications for early intervention*. London: Lawrence Erlbaum Associates. 191–218.

Campbell, R. and E. Sais. 1995. "Accelerated metalinguistic (phonological) awareness in bilingual children". *British Journal of Developmental Psychology* 13. 61–68.

Chard, D. and S. Dickson. 1999. "Phonological awareness: Instructional and assessment guidelines". *LD online.*
<www.ldonline.org/article/6254> Retrieved 12 Oct 2006.

Carr T.H. (ed.). 1985. *The development of reading skills*. San Francisco, CA: Jossey-Bass.

Chiappe, P., L.S. Siegel and L. Wade-Woolley. 2002. "Linguistic diversity and the development of reading skills: A longitudinal study". *Scientific Studies of Reading* 6(4). 369–400.

Durgunoglu, A.Y., W.E. Nagy and B.J. Hancin-Bhatt. 1993. "Cross-language transfer of phonological awareness". *Journal of Educational Psychology* 85. 453–465.

Ehri, L.C., S.R. Nunes, D.M. Willows, B.V. Schuster, Z. Yaghoub-Zadeh, and T. Shanahan. 2001. "Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's metaanalysis". *Reading Research Quarterly* 36(3). 250–287.

Fender, M. 2003. "English word recognition and word integration skills of native Arabic- and Japanese-speaking learners of English as a second language". *Applied Psycholinguistics* 24. 289–315.

Foorman, B.R. and D. Liberman. 1989. "Visual and phonological processing of words: A comparison of good and poor readers". *Journal of Learning Disabilities* 22(6). 349–355.

Frost, R. and L. Katz (eds.). 1992. *Orthography, phonology, morphology and meaning*. Amsterdam: North-Holland.

Gillet, J.W, C. Temple, and A. Crawford. 2004. *Understanding reading problems: Assessment and instruction.* Boston: Allyn and Bacon.

Gillis S. and G. De Schutter. 1996. "Intuitive syllabification: Universals and language specific constraints". *Journal of Child Language* 23. 487–514.

Gough, P.B., L. Ehri, and R. Treiman (eds.). 1992. *Reading acquisition*. Hillsdale, NJ Lawrence Erlbaum.

Gough, P.B. and M.A. Walsh. 1991. "Chinese, Phoenicians, and the orthographic cipher of English". In Brady S. and D. Shankweiler (eds.). 199–209.

Joslin, K. 1994. "A comparison of the effects of pure and modified whole language instruction on the decoding skills of kindergarteners". *ERIC* document ED372367. <www.eric.ed.gov>

Leafstedt, J.M, C.R. Richards and M. Gerber. 2004. "Effectiveness of explicit phonological-awareness instruction for at-risk English learners". *Learning disabilities research and practice* 19. 252–261.

Lyon, G.R. (ed.). 1994. *Frames of reference for the assessment of learning disabilities: New views on measurement issues*. Baltimore, MD: Paul H. Brookes.

Layton, L., K. Deeny, G. Upton and G. Tall. 1998. "A pre-school training programme for children with poor phonological awareness: Effects on reading and spelling". *Journal of Research in Reading* 21(1). 36–52.

Littleton, K., C. Wood, and P. Chera. 2006. "Interaction with talking books: Phonological awareness affects boys' use of talking books". *Journal of Computer Assisted Learning* 22. 382–390.

Lundberg, I., J. Frost and O.P. Peterson. 1988. "Effects of an extensive program for stimulating phonological awareness in preschool children". *Reading Research Quarterly 23*. 264-284.

MacDonald, J. 2000. "Grammaticality judgments in a second language: Influences of age of acquisition and native language". *Applied Psycholinguistics* 21. 395-423.

Morais, J., J. Alegria, and A. Content 1987. "The relationship between segmental analysis and alphabetic literacy: An interactive view". *Cahiers de Psychologie Cognitive* 7. 1–24.

Olofsson, A., and J. Niedersoe 1999. "Early language development and kindergarten phonological awareness as predictors of reading problems: From 3 to 11 years of age". *Journal of Learning Disabilities* 32(5). 464–472.

Perfetti, C.A., I. Beck, L.C. Bell and C. Hughes 1987. "Phonemic knowledge and learning to read are reciprocal". *Merrill-Palmer Quarterly* 33. 283–319.

Perfetti, C.A. 1991. "The psychology, pedagogy and politics of reading". *Psychological Science* 2. 70–76.

Rabab'ah, G. 2005. "Communication problems facing Arab learners of English." *Journal of Language and Learning* 1(3). 180–197.

Romaine, S. 1999. "Bilingual language development". In Barrett M. (ed.). 251–273.

Ryan, A. and P. Meara. 1991. "The case of the invisible vowels: Arabic speakers reading English words". *Reading in a Foreign Language* 7. 531–540.

Sensenbaugh, R. 1996. "Phonemic or phonological awareness?" *ERIC Digest* 5–6.
Sensenbaugh, R. 2000. "Phonemic awareness: An important early step in learning to read". <http://www.kidsource.com/kidsource/content2/phoemic.p.k12.4.html> Retrieved 5 Dec 2003.
Shapley, B. 2001. "Reading first: NIE: Phonemic awareness, text comprehension, phonics, fluency, vocabulary, reading". (A *Newspaper of Education* Teaching Supplement for Reading First/No Child Left Behind.) Published online by the Honolulu Advertiser. <http://nie.honoluluadvertiser.com/nie_ed.nochild.html>
Siedenberg, M. 1992. "Beyond orthographic depth in reading: Equitable division of labor". In Frost, R. and L. Katz (eds.). 85–118.
Simmons, D.C. and E.J. Kame'enui (eds.). 1998. *What reading research tells us about children with diverse learning needs: Bases and basics*. Mahwah, NJ: Lawrence Erlbaum Associates.
Smith S.B., D.C. Simmons and E.J. Kame'enui. 1998. "Phonological awareness: Instructional and curricular basics and implications". In Simmons, D.C. and E.J. Kame'enui (eds.). 129–140.
Snow, C.E., M.S. Burns and P. Griffin (eds.). 1998. *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
Stanovich, K.E. 1986. "Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy". *Reading Research Quarterly* 21. 360–406.
Stanovich, K.E. 1987. "Perspectives on segmental analysis and alphabetic literacy". *European Bulletin of Cognitive Psychology* 7. 514–519.
Stanovich, K. E. 1992. "Speculation on the causes and consequences of individual differences in early reading acquisition". In Gough, P.B., L. Ehri, and R. Treiman (eds.). 307–342.
Stanovich, K. E. 1993. "The language code Issues in word recognition". In Yussen, S.R. and M.C. Smith (eds.). 111–135.
Stuart-Smith, J. and D. Martin. 1999. "Developing assessment procedures for phonological awareness for use with Punjabi-English bilingual children". *The International Journal of Bilingualism* 3. 55–80.
TampaReads. 2003. "Grade 1 National Reading Vocabulary". <http://www.tampareads.com/trial/vocabulary/Grade1/VOC1-new.pdf> Retrieved 15 Mar 2006.
The English Language National Team. 2006. *General guidelines and general and specific outcomes for the English language: Basic and secondary stages*. Amman, Jordan: Ministry of Education.
Vaughn, S., M.T. Hughes, S.W. Moody, and B. Elbaum. 2001. "Instructional grouping for reading for students with learning disabilities: Implications for practice". *Intervention in School and Clinic* 35. 131–137.
Vellutino, F.R., D.M. Scanlon and M.S. Tanzman. 1994. "Components of reading ability: Issues and problems in operationalizing word identification, phonological coding, and orthographic coding". In Lyon, G.R. (ed.). 279–329.
Wagner, R.K., J.K. Torgesen, P. Laughon, K. Simmons and C.A. Rashotte. 1993. "The development of young readers' phonological processing abilities". *Journal of Educational Psychology* 85. 83–103.
Yussen, S.R. and M.C. Smith (eds.). 1993. *Reading across the life span*. New York: Springer Verlag.

APPENDIX

Sample activities showing the various combinations of phonological awareness skills.

Level 1. Initial rime and riming songs

Task 1
1. What rimes with *fist*? *best* *man* *can*
2. What rimes with *fan*? *can* *day* *fly*
3. What rimes with *jump*? *park* *mark* *hump*

Task 2
Teacher: Which word does not rime? but mat cat
Teacher: The word *but* does not rime.

Teacher: Now, say the word which does not rime.
fit hit bat
dry fly lay

Level 2. Sentence segmentation
Students segment sentences into individual words.

Song
I can feel the wind and the rain on my back.
I can hear the train coming down the track.

Poem
We like autumn. We like spring.
We like hearing small birds sing.

Level 3. Syllable segmentation and blending

A. Syllable segmentation
Teacher: The name *Rachel* has two syllables *Ra* and *chel*. What are the syllables in the following words?
animals
table
telephone
cartoon

B. Syllable blending
Teacher: I say the word as syllables, you blend them to make the words.
I say the word *quick – ly*, you say it fast *quickly*. Do the same after me:
fan-tas-tic
hor-ri-fied
car-pet

Level 4. Onset-rime, blending and segmentation

A. Segmenting onsets and rimes
Teacher: Say which sound is the onset in *fall*? The onset is *f*.
Teacher: Say which sound is the rime in *fall*? The rime is *all*.

Task 1
Say the onset in the following words.
bee
fee
can
door

Task 2
Now say the rime in the same words.

B. Blending onsets and rimes into words
Teacher: If you blend the onset *c* and the rime *ar*, you will have *car*.

Task 3
Now blend the following onsets with their rimes.
n-est
b-oy
sn-ake
c-up

Level 5. Segmenting and blending individual phonemes

A. Phoneme segmentation
Teacher: The word *pat* has these sounds *p-a-t*. Say it slowly. If I say *old*, you should say /o/, /l/, /d/. Segment with students *go*, *man* and *ride*.

Now segment the following words into their individual phonemes (sounds). Say the sounds slowly.
stop
sun
man

B. Phoneme blending
Teacher: If I say the word slowly, say it fast.
If I say *mmmmm aaaaa nnnnn* You say *man*.
If I say *ddddd ooooo ggggg*, you say *dog*.

Teacher: Do the same in the following words. The teacher says the sounds slowly.
fan
bell
bed