

DEVELOPMENTAL HIERARCHY OF ARABIC PHONOLOGICAL AWARENESS SKILLS

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Research indicates a strong relationship between phonological awareness and reading success. Phonemic intervention programs clearly show the benefits of explicitly teaching phonological awareness skills. Phonological awareness skills vary in nature and degree of difficulty and appear to follow a developmental progression. This study examined a developmental hierarchy of four Arabic phonological awareness tasks. The participants were 140 native Arabic speaking students from elementary grades one to three. They were administered four different phonological awareness tasks. One-way ANOVA and multiple comparisons were used to analyze the data of the study. The results revealed differences across phonological awareness tasks among different grade levels. Results of this study indicated that the four phonological awareness tasks ranged from easy to difficult in the following; rhyme, initial sound identification, syllable deletion and phoneme segmentation. Significant differences were found in two tasks, identifying the initial sound of the word in favor of grade two and syllable deletion in favor of grade three. However, there were no significant differences in the grade performances regarding the rhyme oddity task and the phoneme segmentation task. This study supports English language research in the sense that there is a hierarchical order behind phonological awareness development. This means that when phonological awareness tasks are trained, they must follow an order. Phonological awareness skills are complicated and place demand on cognitive processes and, therefore, should not be considered randomly.

Considerable research in the past two decades has emphasized the importance of phonological awareness (PA) and phonics in the process of learning to read and write (Byrne & Fielding-Barnsely, 1989; Lewkowicz, 1980; National Reading Panel, 2000; Vandervelden & Siegel, 1995; Wagner & Torgesen, 1987; Yopp, 1988). Phonological awareness (PA) refers to the ability to recognize and make use of the phonological structure underlying spoken language. A large body of research has documented the importance of phonological awareness as an excellent predictor of reading success. Correlation studies, longitudinal studies and intervention studies have not only confirmed the importance of PA in learning an alphabetic script, but also clarified it and extended it.

In fact, researchers now recognize the major difference between successful readers and struggling readers on phonological awareness tasks. Many researchers consider PA a prerequisite for learning to read. Several researchers have developed tests to assess PA skills for readers as well as pre-readers.

The result of research indicates that low-readiness pre-readers are simply unable to think consciously about the sound structure of words. Unlike high-readiness pre-readers, low-readiness pre-readers do not attend to the phonemes of words spoken.

Phonological awareness has been also a component in many reading intervention and instruction programs. Many phonics programs have focused on their PA skills. Phonics, in its simplest sense, refers to a system of teaching reading that teaches the sounds of the alphabetic script. Phonics is an instructional strategy that focuses on teaching correspondences between letters and their corresponding sounds. An ample body of research has proven that implementing systematic phonics instruction has positive impact on children's reading (Adams, 1990; Ehri, Nunes, Stahl & Willows, 2001; Sister Oudeans, 2003). In fact, Ehri et al. (2001) recommended that phonics should be part of literacy

programs to teach beginning readers as well as to prevent and remediate reading difficulties. Comprehension, the ultimate goal of all reading instruction programs, cannot be achieved if a child is not taught to recognize letters, map letters on to their sounds, spelling patterns and also to recognize some whole words Adams (1990).

Research (Adams, 1990; Ehri et al., 2001) proves that skillful readers do translate spellings to sounds as they read. Although, skillful readers seem to recognize familiar words visually, skillful readers visually process every individual letter of every word as they read (Adams, 1990). This is evident when skillful readers detect sometimes the slightest misprint that may appear in a long word or a text. In addition, skillful readers use context to speed the interpretation of orthographic information only after the word is identified. That is, context does not take the place of orthographic information. Therefore, skillful readers possess knowledge of word's pronunciation. Spelling-sound associations serve as a backup system for recognizing visually less familiar words. Indeed, research clearly indicates the importance of the phonological processor in this process of reading the alphabetic script. Observations of everyday reading behavior of beginning readers clearly reveal this sounding out behavior in both reading and writing attempts.

Therefore, activating the phonological processor plays a critical role in the process of learning to read (Ehri, 1992). Indeed, Bryant and Goswami have said, *the discovery of a strong relationship between children's phonological awareness and their progress in learning to read is one of the great successes of modern psychology* (1987, p. 439).

Children's conscious appreciation of syllables and later on of individual phonemes is strongly related to reading acquisition. Children's knowledge of letters and letters' sounds is a crucial matter for reading acquisition. In fact, understanding and using the alphabetic principle depends equally on knowledge of letters and explicit awareness of the phonemes these letters represent. Adams (1990) has stated that *knowledge of letters and phonological awareness have been found to bear a strong and direct relationship to success and ease of reading acquisition* (p. 44).

Phonological awareness is not acquired spontaneously. It seems to develop only through systematic and explicit training. Teaching phonological awareness requires considerable time and effort. Phonological awareness skills (phonemes & syllables) when taught result in significant gains in reading for most children. In fact, several studies reported that children who received phonological awareness instruction had higher scores on measures of reading achievement than children who did not receive instruction in phonological awareness (Ball & Blachman, 1991; Cunningham, 1990; O'Connor, Jenkins, & Slocum, 1995; Torgesen, Morgan, & Davis, 1992). Indeed, Cunningham (1990) has noted that kindergarten children with explicit instruction in phonological awareness did better than a group of first graders who had no instruction on PA skills, indicating that this important pre-skill for reading can be taught.

Phonological awareness tasks vary in type and difficulty. Several of these tasks have been addressed in the literature in the English language over the past 20 years. Some tasks are at the syllable and intra-syllabic levels, while others are at the phoneme level. Some examples of phonological awareness tasks include: phoneme segmentation, syllable segmentation, phoneme manipulation, rhyme generation, odd word out, phoneme synthesis, syllable blending and deleting sounds (Ball & Blachman, 1991; Byrne & Fielding-Barnsley, 1991; Cunningham, 1990; Yopp, 1988). Also, diversity in the phonological awareness tasks is of importance because of its developmental progression. The developmental nature of phonological awareness skills has implications for both assessment and intervention. Some tasks are easier than others; hence develop earlier (Vandervelden & Siegel, 1997; Yopp, 1988). Assessment results of phonological awareness show that some tasks are beyond the ability of children for a certain age group. For example, phoneme manipulation tests have been found to be beyond the ability of children before the end of first grade (Lundberg, Olofsson, & Wall, 1980). On the other hand, initial sound recognition test or as Adams (1990) named it syllable-splitting test is considered easier than phoneme segmentation or manipulation tests. Other phonological tasks such as phoneme segmentation are more difficult because they require the child to know every little sound in a word in isolation. This ability usually comes as a result of learning to read and when the child has already acquired larger units (e.g. Syllables & words). Hence, the better children are at decoding, the better they do on the phoneme tapping or phoneme segmentation tests (Adams, 1990; Turner & Nesdale, 1985). Children seem to do better with larger units of sounds (syllables) than with smaller units of sounds (phonemes) (Stahl & Murray, 1994; Treiman & Zukowski, 1991). The difficulty of phonological awareness tasks has

implications for instructional strategies. Thus, teachers should engage students initially in activities that focus on larger units such as syllables and sub-syllabic unit the onset and rime (Yopp & Yopp, 2000).

Research literature on the English language has addressed the issue of the different types of phonological awareness tasks and the variations in the difficulty of these tasks. Several researchers also added that the number of sounds in a word is a factor in the difficulty of the task (Adams, 1990; Smith, Simmons & Kaneenui, 1998; Yopp, 1988; Yopp & Yopp, 2000). For example, Yopp and Yopp, (2000) noted that matching initial sounds is an easy task whereas segmenting spoken words into their constituent sounds is more difficult. That is, fewer sounds are easier than more sounds. In addition, the location of the sound in the word (initial, medial, final) makes a task easier or more difficult than the other. For example, asking the child to identify the initial or final sound is easier than the middle sound (McBride-Chang, 1995).

The purpose of the present study is to examine the nature of some phonological awareness tasks in the Arabic language. The study presented here aims at discovering the level of difficulty of four Arabic phonological awareness tasks. Findings from this study can provide information about the acquisition of phonological awareness in Arabic and hence has instructional implications.

Method

Participants

The participants in the study were 140 (male & female) from the first three elementary grades; one (n=58), two (n=51), and three (n=31). The sample was selected from a number of elementary grade classes in Al-Ain city of United Arab Emirates (UAE). The three classes were selected randomly for each grade level. These schools were public schools from the city of Al-Ain in the Emirate of Abu Dhabi.

Materials

The tool of the study consisted of four phonological awareness tasks that were presented orally. The four tasks were developed for the present study. The tasks varied in nature and degree of difficulty. The four tasks included in the present study were: identifying the initial sound in a word, rhyme oddity, syllable deletion and phoneme segmentation of words. Each of the four tasks included ten items. The words in each task were selected from the Standard Arabic language curriculum in the UAE. The language used in these texts is the Modern Standard Arabic (MSA) as opposed to spoken Arabic. The four phonological awareness tasks were selected after a review of phonological awareness tasks in English. In addition, the items in the four tasks were selected based on what is appropriate for the Arabic word syllabic structures and what is common (Ababneh, 2000).

Initial sound identification

In this task, the examiner presented a word orally and asked the child to say the initial sound of the word. For example, *What sound does the word /samak/ (fish) begin with?* The child had to say the sound /s/. In this task, each correct response received one point. The maximum score for this measure was ten points.

Rhyme Oddity

In this task, the examiner orally introduced a set of three words. Two words are similar in rhyme but one word is different in rhyme. For example, the examiner asked the child which word is different in rhyme when I say /da:r/, /na:r/, /samak/. The child had to say the word /samak/ because the rime is different. This measure received one point for each correct answer. The maximum score for this measure was ten.

Syllable Deletion

In this task, the examiner orally presented a word to the child and instructed him/her to provide a new word after deleting one syllable provided by the examiner. For example, the examiner said which word do you get out of /jama:l/ (beauty) when we delete the syllable *ja-*. The child had to say the word /ma:l/ (money). Each correct answer the child produced received one point Maximum 10.

Phoneme segmentation

In this task, the examiner orally presented the stimuli to the child and instructed the child to segment the word into its constituent phonemes. It should be noted that Arabic and English are quite different

orthographically and in the relationship between the orthographic system and the sounds in the spoken language. Phoneme segmentation is a task that requires special consideration especially when administering it to young children. Therefore, the examiner included practice items with feedback followed by ten items. The performance on the practice items was not included in the sub-tests score. For example, in this segmentation sub-test the examiner presented a word by asking *How can we divide the word /samak/ (fish)?* The child had to respond by saying all the consonants and the short vowels that the word included in the past. Each correct answer the child provided received one point summing up to a total of ten points.

To investigate the reliability of the tool, it was administered to a pilot of 20 students and then re-administered after two weeks. The correlation co-efficient was .85. To determine the validity of the tool, a number of methods were used. The tasks and their items were designed after reviewing the Arabic language curriculum in order to choose familiar words from Arabic curricular texts. In addition, the tasks were designed based on a review of literature on phonological awareness at the word, syllable, and phoneme levels. The tool was designed in its preliminary form and then it was sent for evaluation to three reviewers and five senior teachers in order to evaluate the relevancy of items to the students' curricula. Their comments were taken into consideration and modifications were made accordingly. To finalize the tool, it was given to three faculty members at the College of Education, UAEU. Their comments regarding the language of the items were incorporated into the final tool. The tests were administered to each student individually and lasted approximately 45 minutes.

Results & Discussion

One-way ANOVA and multiple comparisons were used to analyze the data of the study. Table 1 presents means and standard deviation for the four PA tasks for each grade. When comparing students' performance on the task of identifying the initial sound in a word, grade two children had significantly a higher mean score (mean = 8.90) than grade one children (mean = 7.7) as can be seen in Table 2. This result may be due to the fact that by the time Arabic speaking students reach second and third grades, they have already acquired the necessary knowledge related to the alphabetic principle and auditory discrimination skills which in turn enable them to identify the first sound in a word.

Table 1:
One way ANOVA of participant's performance according to the grade level and variables of phonological Awareness tasks

| Variable | Grade | N | Mean | Std. Deviation | Sig. |
|------------------------------|---------|----|------|----------------|------|
| Initial sound identification | Grade 1 | 58 | 7.70 | 2.195 | .019 |
| | Grade 2 | 51 | 8.90 | 1.897 | |
| | Grade 3 | 31 | 8.42 | 2.161 | |
| Rhyme oddity | Grade 1 | 58 | 8.10 | 1.917 | .144 |
| | Grade 2 | 51 | 8.45 | 1.419 | |
| | Grade 3 | 31 | 8.84 | 1.635 | |
| Syllable deletion | Grade 1 | 58 | 7.03 | 3.392 | .050 |
| | Grade 2 | 51 | 7.88 | 3.083 | |
| | Grade 3 | 31 | 8.58 | 1.727 | |
| Phoneme segmentation | Grade 1 | 58 | 5.24 | 3.817 | .144 |
| | Grade 2 | 51 | 4.55 | 4.487 | |
| | Grade 3 | 31 | 6.42 | 4.154 | |

In the rhyme oddity task, there were no significant differences among the means for the three grades. This may be due to the fact that rhyme tasks are considered easy and therefore mastered early (Yopp & Yopp 2000; Adams, 1990). The fact that the rhyme oddity task implemented in the present study turned out to be the easiest may be due to the fact that the final phoneme is easier to isolate than initial phoneme. In fact, in another research on Arabic phonemic awareness, it was reported that initial phonemes were harder to isolate than final phonemes (Saiegh-Haddad, 2003). In addition, Arabic students' early exposure to Quranic texts stimulates their awareness of rhyme and alliteration. Quranic verses have a high percentage of rhyme that facilitates memorization and recitation of Quran even if one does not speak the Arabic language.

In the syllable deletion task, the mean score for students in grade three was significantly higher (mean = 8.58) than for grade one students (7.03) as seen in Table 2. This may be due to the difficulty of the task. That is, deleting a syllable and producing a new meaningful word with a different meaning from

the original word requires higher language skills when dealing with the form and content of the word. Also, syllable deletion is a higher order of phonological awareness and more sophisticated than simple tasks such as rhyme or initial sound identification.

Table 2
Multiple Comparisons for Tasks 1-4 by Grade Level

| Dependent Variable | Class | Class | Mean Difference | Std. Error | Sig. |
|------------------------------|---------|---------|-----------------|------------|------|
| Initial sound identification | Grade 1 | Grade 2 | -1.135* | .400 | .005 |
| | | Grade 3 | -.652 | .464 | .162 |
| | Grade 2 | Grade 3 | .483 | .474 | .311 |
| Rhyme oddity | Grade 1 | Grade 2 | -.348 | .324 | .285 |
| | | Grade 3 | -.735 | .375 | .052 |
| | Grade 2 | Grade 3 | -.388 | .384 | .315 |
| Syllable deletion | Grade 1 | Grade 2 | -.84787 | .57302 | .141 |
| | | Grade 3 | -.154616* | .66414 | .021 |
| | Grade 2 | Grade 3 | -.69829 | .67983 | .306 |
| Phoneme segmentation | Grade 1 | Grade 2 | .692 | .796 | .386 |
| | | Grade 3 | -1.178 | .922 | .204 |
| | Grade 2 | Grade 3 | -1.870* | .944 | .050 |

• The mean difference is significant at the .05 levels

As for the phoneme segmentation task, means were almost the same across all three grades. This may be due to the fact that isolating each sound as a discrete sound is more difficult than analyzing words into syllables. It has been shown in the English literature that syllable analysis is easier than phoneme analysis and hence develops earlier. Awareness of phonemes, although the most closely PA task tied to decoding skills, seems to come only after a child is aware of larger units. Also, with phoneme segmentation tests, it is possible that the ability to tap the number of phonemes is a result of learning to read, as well as a possible cause (Adams, 1990; Yopp & Yopp, 2000). Furthermore, one may argue that dealing with larger units in Arabic would be easier than dealing with smaller units because Arabic is considered a syllabic language. Therefore, it would be easier for Arabic speaking children to break an Arabic word into syllables rather than single phonemes.

The results of this study revealed that phonological awareness skills in Arabic seem to follow a developmental hierarchy. This finding is congruent with other findings from the literature on the development of phonological awareness in English speaking children. That is, there seems to be a hierarchical organization in the rate of acquisition of the different types of phonological awareness skills in Arabic.

The results indicated that some phonological awareness tasks are easier than others. Identifying the initial sound of a word and rhyme oddity tasks are easy tasks when compared to syllable deletion and phoneme segmentation. This finding as indicated earlier is consistent with other findings from the literature on the English language (Adams, 1990; Vandervelden & Siegel, 1995; Yopp, 1988). This study revealed that the hierarchical order of the Arabic phonological skills investigated here ranked from easy to most difficult as follows: identifying initial sound, rhyme oddity, syllable deletion and lastly the phoneme segmentation task.

Another important finding is that the phoneme segmentation task in Arabic is the most difficult one. This finding is consistent with previous findings in English. That is, larger units (e.g. syllables) are acquired faster than smaller units (Adams, 1990; Turner & Nesdale, 1985). Also, it seems the case that Arabic children do better in phonological skills related to larger units than phonological skills related to smaller units. This finding may be due to the strong cohesion found in Arabic between the initial consonant and its following vowel (Saiegh-Haddad, 2003).

Conclusion

This study tested four phonological awareness tasks in Modern Standard Arabic. A total of 140 children were randomly selected from public first, second and third elementary classes from Al Ain city in the Emirate of Abu Dhabi in the United Arab Emirates. The primary aim of the study was to examine the developmental nature of some phonological awareness tasks in Modern Standard Arabic. The results showed that there was a developmental progression across all three grade-level groups on all four PA tasks. Further, it was shown that the four PA tasks selected for the present study varied in

their degree of difficulty. For example, the rhyme oddity task was the easiest among all four tasks examined for the purpose of this study. This result conforms to the fact that larger syllables are easier than single phonemes especially in the case of Arabic (Saiegh-Haddad, 2007). Adams (1990) has theorized that phonological awareness tasks in the English language may be classified according to levels of difficulty with the easiest being tasks that measure the ability to remember familiar rhyming words followed by the ability to recognize and classify patterns of rhyme and alliteration which is exactly what the rhyme oddity task, selected for the present study, required students to do.

Adams (1990) stated also that full segmentation of all the phonemes within words is a fourth level of analysis, followed by phoneme addition, reversal, deletion and other manipulation processes. Results of the present study also showed that the phoneme segmentation task proved to be the most difficult task and, therefore, developed at a higher grade level. This finding confirms earlier findings by Saiegh-Haddad (2007) which stated *Arab children find initial phonemes and initial singleton phonemes the most difficult to segment* (p. 620). Overall, this study supports previous claims that there is a hierarchical order to the development of phonological awareness in spite of differences in language structures.

Nevertheless, one should note here that this study involved only school-aged children who are already exposed to formal instruction in reading. This means that children's performances across all grade levels on the PA tasks in this study may have been influenced by their formal exposure to the orthographic structure of the language. Future research that includes a younger age group (preschoolers) is suggested to examine closely the nature of their performance on PA tasks prior to their school-based knowledge of orthography.

Findings of the current study have important practical implications for both assessment and instruction. That is, when practitioners or assessors develop assessment tools, they need to ensure that there is a variety of PA subtests (phoneme & syllable levels); that they provide varied degrees of test difficulty; and that they are able to administer the test to different age groups. As for instructional implications, teachers need to be sensitive to the level of difficulty of the PA tasks to be taught. Teachers must be knowledgeable about the graded level of difficulty of PA tasks. For example, teachers need to know which PA tasks will be more suitable to teach to younger children. For these children, PA tasks that deal with rhyme and initial sound identification will be more suitable to teach than other PA tasks that require manipulation of the sounds in memory.

Future research should further examine the developmental progression of other PA tasks and include younger children who have not been exposed to formal literacy instruction. In addition, the role of the Consonant-Vowel (CV) unit in segmenting Modern Standard Arabic words into phonemes should be further examined. Moreover, students' performances on other PA tasks could be compared to their reading of single words and spelling as well examining closely the relationship between PA and other reading and reading-related measures. Further research on the nature of reading processes in the Arabic language is warranted.

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