



The Reading Matrix © 2010
Volume 10, Number 1, April 2010

Measuring Greek and Greek-Cypriot Students' Phonological Awareness Skills: A Preliminary Study

Anastassia Triga

University of Patras, Greece

University of Thessaly, Greece

Deree College, American College of Greece

Polina Kakopsitou

Spitaliou-Paramythas Preschool

ABSTRACT

The purpose of this study was to develop a new Greek phonological awareness test for preschool and primary school age children (ages 5-7) in Greece and Cyprus. A new phonological awareness test with 168 items was individually administered to 132 students (60 students in Cyprus and 72 students in Greece) from five urban, five semi-rural, and three rural schools. The results showed that there were differences in phonological awareness between Greek and Greek-Cypriot students in all age groups. There were no differences in relation to gender in either country and there were no differences in phonological awareness in relation to school area.

INTRODUCTION

Phonological awareness refers to the metalinguistic knowledge of the sound structure of language, that is, conscious awareness of the phonological structure of sentences, phrases and words (Blachman, 1994; Panteliadou, 2000). Stanovich, Cunningham, and Cramer (1984) define phonological awareness as the ability to deal explicitly and through segments with sound units smaller than the syllable. They also note that researchers “argue intensely” about the meaning of the term and about the nature of the tasks used to measure it. Phonological awareness is the understanding of the different ways that oral language can be divided into smaller components so that it can be manipulated. Another often cited source (Adams, 1990) uses almost exclusively “phonemic awareness” instead of phonological awareness.

Phonological awareness sometimes refers to an awareness that words consist of syllables, “onsets and rimes” and phonemes and so can be considered as a broader notion than phonemic awareness. If children understand that words can be divided into individual phonemes and that phonemes can be blended into words, they are able to use letter-sound knowledge to read and build words. As a consequence of this relationship, phonological awareness in kindergarten is a strong predictor of later reading success (Perfetti, Beck, Bell, & Hughes, 1987; Roth & Schneider 2001). Researchers have shown that this strong relationship between phonological awareness and reading success persists throughout school

(Bradley & Bryant, 1985; Goswami & Bryant, 1990; Lundberg, Frost, & Petersen, 1988). Therefore, phonological awareness appears to play a causal role in reading acquisition. It is a foundational ability underlying the learning of spelling-sound correspondences (Stanovich, 1993-1994). Moreover, recent research has shown positive causal effects for several of the predictors of reading achievement and also demonstrated positive training effects in practical applications. Among the most effective interventions are programs for the training of phonological awareness (Olofsson, 2001).

LANGUAGE DIALECTS AND PHONOLOGICAL AWARENESS

Languages vary in their phonological characteristics and this may have an impact on which levels of phonological segmentation are important for reading and spelling. English for example, has many monosyllabic words and also many complex syllables; there are many irregularities for English spelling which cannot be learned simply by letter-sounds correspondences (Goswami & Bryant, 1990). Greek language does not have many monosyllabic words and has a lot of consonant-vowel syllables. For this reason, in languages such as Greek, when either a phonological task or a phonological test is made, it is expected that syllables would play a very significant role in predicting reading and writing later on. Dialect also plays a key factor in children's reading success. As far as the English language is concerned, the differences between a young child's dialect and the standard classroom English dialect may become a risk factor for reading difficulties. With regard to reading instruction in particular, the risk for confusion is considerable. For example, if the teacher is pointing out the letter-sound correspondences within a word that is pronounced quite differently, the lesson could confuse more than enlighten (Snow, Burns, & Griffin, 1998). In Okalidou's, Petinou's, Theodorou's, and Karasimou's (2009) study, where Greek-Cypriots' and Greek students' phonological awareness skills were investigated, they found that the Greek children understand that the plosive consonants are divided into voice and voiceless earlier than Cypriot children. Greek children understand the separation at the age of 2, while Cypriot children understand it after the age of 3.

ASSESSMENT AND PHONOLOGICAL AWARENESS

Educators are always looking for valid and reliable predictors of educational achievement. As mentioned earlier, one of reasons why educators are so interested in phonological awareness is that research indicates that it is the best predictor for the ease of early reading acquisition (Stanovich, 1993-1994), even better than IQ, vocabulary, and listening comprehension. Instruments to test for a child's phonological awareness tend to be short, easy to administer, reliable, and valid. Stanovich provides a quick (7-minute), easy-to-administer phonological awareness test in an article in which he discusses his career as a researcher. Yopp (1995) presents a similarly brief assessment instrument and offers detailed evidence for its validity and reliability.

It seems that quite a large number of English tests, e.g., (a) The Phonological Awareness Test and Phonological Awareness Assessment Instrument for 5–9 years old children (Robertson & Salter, 1997), (b) CTOPP Comprehensive Test of Phonological Progressive for 5 years old children and for 11–24 years young adults (Wagner, Torgesen, & Roshotte, 1999), and (c) The Yopp-Singer Test of Phoneme Segmentation (Yopp-Singer, 1995) for 5-6 years old children exist in the English language. Such tests are very rare for the Greek language and the ones that exist have not yet been standardized. Accordingly, the purpose of this study was:

1. To develop a reliable and valid instrument for measuring phonological awareness skills in preschool and first and second graders.
2. To compare the results of Greek and Greek-Cypriot students that completed the test.
3. To compare students' results on this test in relation to gender.
4. To compare students' results on this test in relation to school area, i.e., rural, semi rural, and urban schools.

METHODOLOGY

Participants

The participants in this study were 132 students in total from both countries, Greece and Cyprus. There were 72 students (36 boys, 36 girls) from Greece and 60 students (30 boys, 30 girls) from Cyprus. The sample was taken from two major cities from each country, Athens and Patras from Greece and Nicosia and Limassol from Cyprus. A sample of 32 students (16 boys, 16 girls) was taken from Athens and 40 students (20 boys, 20 girls) from Patras. Another sample of 24 students (12 boys, 12 girls) was taken from Nicosia and 36 students (18 boys, 18 girls) from Limassol. The schools chosen were from urban (5 schools), semi-rural (5 schools) and rural (3 schools) areas. Students' age, gender, and area of school were all taken into consideration prior to the administration of the test. The students were divided into three age groups: Students from (1) kindergarten (5 years old); (2) first grade (6 years old); and (3) second grade (7 years old).

All the children were monolingual speakers of Greek and none was diagnosed with learning disabilities or any other disability. Table 1 shows the number of students who participated in this research.

Table 1. Number of Greek and Greek-Cypriot Students

Schools	Number of Students	Male	Female
Limassol	36	18	18
Nicosia	24	12	12
Athens	32	16	16
Patras	40	20	20
Total Cyprus	60	30	30
Total Greece	72	36	36

A sample of 32 students (16 boys, 16 girls) was taken from Athens and 40 students (20 boys, 20 girls) from Patras.

Materials

The creation of this new phonological awareness test was mainly based on the research work of Bradley and Bryant (1978), Treiman and Zukowski (1991), Lenel and Cantor (1981) and Liberman and Shankweiler (1974). All the words used to form the items for this test were taken from books that were matched to the students' age and grade. The test consists of two parts: A and B.

Part A is called *epilinguistic* and is composed of three exercises: (a) odd-word-out test, (b) same-different matching test, and (c) rhyming test. The first task requires the students to choose the two words out of three that match phonologically. An example from a test item is: the words /san/ /tu/ /tis/. The second task requires the students to decide whether the two words that they hear sound the same or not. An example is: The words /zari/ /zali/. The last task investigates whether the students can understand rhyming. An example is: the word /tote/ is given and after a while the words /pote/, /pame/, and /toso/ are given. The student has to decide which of the three given words match the main word.

Part B of the test examines the *metalinguistic* level of phonological structure in oral speech. It consists of four parts: (a) syllabic or phonemic segmentation, (b) blending, (c) syllabic or phonemic deletion, and (d) syllabic or phonemic inversion. In the first task, a word is given and the student has to break it in syllables or phonemes, which the student tells them in succeeding order. For example: the word /xilino/, the child has to say /xi/ /li/ /no/. In the second task, the student hears the syllables or phonemes in succeeding order and has to blend them in order to make the word. For example, the syllables /ka/ /na/ ta/, constitute the word /kanata/. The third task requires the student to create a new word after the deletion of a phoneme or syllable. For example, the word /kunupi/, becomes /nupi/ after the first syllable deletion. The last task requires the student to invert the word. For example, the word /pote/, becomes /tepo/.

Design and Procedure

The test was individually administered to all children in their schools. Greek-Cypriot students were tested from October 2007 to February 2008 and Greek students were tested from January 2008 to June 2008. The duration of the test was about 30 minutes, during which the whole test was completed.

Results

As the development of this new phonological awareness test is in its initial stage, this research serves as a preliminary study. All 168 items were analyzed through the Classical item analysis. This analysis showed that a few questions had to be replaced with different items. A few items were either too easy or too difficult, or not appropriate and, therefore, had to be replaced by other test items. The total item difficulty of the test was 46% for Kindergarten, 77% for first grade, and 88% for second grade. As the sample of this study was not a large sample, the Item Discrimination was measured for all grades together. The item discrimination for this test was 0.47. Around 45 items needed to be replaced by new items. Most of the items that had to be replaced were from Part A, that is, the ‘epilinguistic’ part, which is composed of the three exercises: odd-word-out test, same-different matching test, and rhyming test. Moreover, some phonemes and monosyllabic words were very easy for the students and, as it turned out, there were too many items for the odd-word-out test. A few changes also needed to be made to Part B, the ‘metalinguistic’ part, which consists of four parts: syllabic or phonemic segmentation, blending, syllabic or phonemic deletion, and syllabic or phonemic inversion. Most of the changes that had to be made were at the syllabic or phonemic deletion part, especially in the two-syllable words and blends, where some words turned out to be not pleasant or not suitable for the age group tested.

Three independent t-tests were conducted to compare the mean scores of Greek and Greek-Cypriot students for all grades. There was a statistically significant difference ($t(44) = 2.9, p < 0.05$) in the scores of Greek and Greek-Cypriot kindergarten students. The calculated effect size of 0.17 is large (Cohen’s $d = 0.9, r = 0.4$), indicating that 17% of the variance in

kindergarten students' total score can be explained by the country of origin. There was also significant difference ($t(39) = 2.2, p < 0.05$) in the scores of Greek and Greek-Cypriot first grade students. The effect size of 0.12 (Cohen's $d = 0.7, r = 0.3$) is large, indicating that 12% of the variance in first grade students' total score can be explained by the country of origin. Moreover, there was also significant difference ($t(43) = 2.2, p < 0.05$) in the scores of Greek and Greek-Cypriot second grade students. The effect size of 0.12 is large (Cohen's $d = 0.7, r = 0.3$), indicating that 12% of the variance in second grade students' scores can be explained by the country of origin. The results of the t-test analysis are shown in Table 2.

Table 2. Scores Among Greek and Greek-Cypriot Students

Grade	Greek			Greek-Cypriot			df	t values	Sig. level
	n	M	SD	N	M	SD			
Kindergarten	26	84.61	12.29	20	73	13.29	44	2.9	0.005
First	21	136.9	19.21	20	122.7	21.01	39	2.2	0.029
Second	25	149.2	10.97	20	140.5	14.76	43	2.2	0.028

Six additional independent t-tests were conducted (three for Greece and three for Cyprus) in order to compare male and female phonological skills. No significant difference was found between Greek kindergarten male and kindergarten female ($t(24) = 1.39, p > 0.05$) or between Greek-Cypriot kindergarten male and kindergarten female ($t(18) = 0.033, p > 0.05$). In addition, no significant difference was found between Greek first grade male students (and first grade female students ($t(19) = 0.210, p > 0.05$) or between Greek-Cypriot first grade male students and first grade female ($t(18) = 0.006, p > 0.05$). There was also no significant difference between Greek second grade male students and second grade female ($t(23) = 0.718, p > 0.05$) or between Greek-Cypriot second grade male students and second grade female students ($t(18) = 1.82, p > 0.05$). The results of the t-test analysis are shown in Tables 3 and 4.

Table 3. Differences Among Greek Male and Female Students

Grade	Greek Male			Greek Female			df	t values	Sig. level
	n	M	SD	n	M	SD			
Kindergarten	13	87.92	14.8	13	81.3	8.4	24	1.39	0.175
First	10	137.9	15.72	11	136.09	22.67	19	0.21	0.836
Second	13	150.76	10.17	12	147.58	12.01	23	0.718	0.48

Table 4. Differences Among Greek-Cypriot Male and Female Students

Grade	Greek-Cypriot Male			Greek-Cypriot Female			df	t values	Sig. level
	n	M	SD	n	M	SD			
Kindergarten	10	73.6	16.64	10	73.4	9.8	18	0.033	0.974
First	9	122.66	23.96	11	122.72	19.48	18	0.006	0.995
Second	11	145.63	10.31	9	134.22	17.43	18	1.82	0.085

Two one-way analysis of variance (ANOVA) were conducted between groups to explore the impact of school area on students' total scores as measured by the new

phonological awareness test. Schools were divided into three area groups (Group 1: Urban, Group 2: Semi-rural, and Group 3: Rural). There was no statistical significant difference at the $p < 0.05$ level in phonological awareness test's scores for the three area groups in both countries, i.e., $F(2, 57) = 0.735$, $p = 0.484$ for Cyprus and $F(2, 69) = 0.231$, $p = 0.795$. Despite not reaching statistical significance, the actual mean scores between the groups are shown in Tables 5, 6, 7, and 8.

Table 5. Mean Scores of Greek-Cypriot Students in Relation to School Area

Area	n	M	SD
Urban	24	117.5	33.3
Semi Rural	24	106.1	32.7
Rural	12	113.7	33.4
Total	132	112.2	32.9

Table 6. ANOVA for Greek-Cypriot Students

	df	F	Sig.
Between Groups	2	0.735	0.484
Within Groups	57		
Total	59		

Table 7. Mean Scores of Greek Students in Relation to School Area

Area	n	M	SD
Urban	30	123.9	34.5
Semi Rural	30	122.9	32.4
Rural	12	116.5	26.9
Total	72	122.3	32.2

Table 8. ANOVA for Greek Students

	df	F	Sig.
Between Groups	2	0.231	0.795
Within Groups	69		
Total	71		

DISCUSSION AND CONCLUSION

The aim of the present study was to develop a reliable and valid instrument of measuring phonological awareness skills of children in preschool and first and second grades of elementary school. Since there is no other standardized Greek phonological awareness test in Cyprus, an attempt to develop such an instrument was made. The classical item analysis showed that there were around 45 items that needed either to be removed or replaced by new test items. Some of the items were either too easy or too difficult. Some language awareness tasks were time consuming or some phonemic tasks were not pleasant for some students and these items need to be revised. In general, both Greek and Greek-Cypriot students made more mistakes in phonemic tasks than in syllabic tasks, but this finding is in accord with the studies by Liberman and Shankweiler (1974), Fox and Routh (1983) and Treiman and Zukowski (1991). It seems that students, regardless of mother tongue language, acquire syllabic awareness quicker than phonemic awareness.

The present study represents only a pilot study and subsequent research for standardization of this new instrument has already started in Cyprus, with the explicit goal that this instrument will be used by teachers, psychologists, and speech and language pathologists in order to identify students at risk for later school success and to measure students' phonological awareness in comparison to their chronological age.

Another aim of the study was to compare the phonological awareness skills of Greek and Greek-Cypriot students. There were significant statistical differences in phonological awareness scores between Greek and Greek-Cypriot students in all age groups. This is a very important finding, because it allows us to conclude that this new, developed test needs to be standardized both in Greece and Cyprus. This means, that two tables of norms, (i.e., one in Greece and one in Cyprus) need to be produced.

Furthermore, another aim of this study was to explore the differences in phonological awareness skills, between male and female. The findings demonstrated that there was no statistical difference in the scores of males and female Greek and Greek-Cypriot students. No other research has been done in order to compare Greek or Greek-Cypriot males' and females' scores on phonological awareness skills. A study by Triga (2005) has been conducted in relation to reading achievement and no differences were found in males' and females' reading scores.

The last aim of this study was to explore the impact of school area on students' scores. There were no differences in students' scores in relation to school area. Assessment of phonological awareness serves essentially two purposes: to identify students who appear to be at risk for difficulty in acquiring beginning reading skills and to regularly monitor the progress of students who are receiving instruction in phonological awareness. It is our intention that this new test will serve these two purposes. Future research in the Greek language is needed, as success in early reading depends on achieving a certain level of phonological awareness. Screening measures are predictive of future reading ability and can separate high from low performers.

REFERENCES

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, UK: MIT Press.
- Blachman (1994). What we have learned from longitudinal studies of phonological awareness and reading, and some unanswered questions: A response to Torgessen, J., Wagner, D. A., & Rashotte, C. A. *Journal of Learning Disabilities*, 27, 287-291.
- Bradley L., & Bryant, P. E. (1978). Difficulties in auditory organization as a possible cause of reading backwardness. *Nature*, 271, 746-747.
- Bradley, L., & Bryant, P. E. (1985). Categorizing sounds and learning to read—a causal connection. *Nature*, 301, 419-421.
- Fox, B., & Routh, D. (1984). Phonemic analysis and synthesis as word-attack skills: Revisited. *Journal of Educational Psychology*, 76, 1059-1064.
- Goswami, V., & Bryant, P. (1990). *Phonological skills and learning to read*. London, UK: Erlbaum.
- Lenel, J. C., & Cantor, J. H. (1981). Rhyme recognition and phonemic perception in young children. *Journal of Psycholinguistic Research*, 10, 57-68.
- Liberman, I., & Shankweiler, D. (1974). Explicit syllable and phoneme segmentation in the young child. *Journal of Experimental Child Psychology*, 18, 201-212.
- Lundberg, I., Frost, J., & Petersen, O., P. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly*, 23(3), 263–284.
- Olofsson, A. (2001). Towards a method for assessing of reading-related development in preschool children: Print awareness and metaphonological skills in practical application. *Psychology*, 8(3), 300- 312.

- Panteliadou, S. (2000). *Mathisiakes Dyskolies kai Ekpaideftikh Praxi: Ti kai Giati*. Ellinika Grammata: Athens
- Perfetti, C., Beck, I., Bell, L., & Hughes, C. (1987). Phonemic knowledge and learning to read are reciprocal: A longitudinal study of first grade children. *Merrill Palmer Quarterly*, 33(3), 283-319.
- Okalidou, A., Peteinou, K., Theodorou, E., Karasimou, E., (2009). *Development of voicing contrasts in stop sounds in Modern Greek and Cypriot Greek Children*. 5th Colloque International de Linguistique Greque Univerite Rene Descartes.
- Robertson, C., & Salter, W. (1997). *The phonological awareness test and phonological awareness assessment instrument for 5–9 years old children*. Linguisystems.
- Roth, E., & Schneider, W. (2001). The effectiveness of Kindergarten programs, which aim at preventing reading and spelling problems in school: A comparison of three different approaches. *Psychology*, 8(3), 313-329.
- Snow, C. E., Burns, S. M., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children, Chapter 4: Predictors of Success and Failure in Reading*. Washington DC: National Academy Press.
- Stanovich, K., Cunningham, A., & Cramer. (1984). Assessing phonological awareness in Kindergarten children: Issues of task comparability. *Journal of Experimental Child Psychology*, 38, 175-190.
- Stanovich, K. E. (1993-1994). Romance and reality (distinguished educator series). *Reading Teacher*, 47(4), 280-91.
- Treiman, R., & Zukowski, A. (1991). Levels of phonological awareness. In S. Brady & D. Shankweiler (Eds.), *Phonological processing in literacy* (pp.67-83). Hillsdale, NJ: Erlbaum.
- Triga, A. (2005). *Test anagnostikis ikanotitas*. Athens, Greece: Atrapos.
- Wagner, R., Torgesen, J., & Roshotte, C. (1999). *CTOPP Comprehensive test of phonological progressive for 5 years old children and for 11–24 years young adults*. ProEd.
- Yopp, H. K. (1995). A test for assessing phonemic awareness in young children. *Reading Teacher*, 49(1), 20–29.
- Yopp, H., K., & Singer, H. (1995). The Yopp-Singer test of phoneme segmentation. *The Reading Teacher*, 49(1), 22-26.

Dr. Anastassia Triga is teaching at the University of Patras, Department of Education and at the University of Thessaly, Department of Preschool Education, Greece. Her areas of research are psychometrics (i.e., developing and standardizing tests for education). She also works as an educational psychologist at the American College of Greece, Hallowell Center for Learning Difficulties. She has authored three reading tests and has published many articles. Anastassia Triga has two master degrees from Boston College and Boston University and got her PhD from the University of Cambridge, UK.

E-mail: a.triga@cantab.net.

Polina Kakopsitou is a speech and language pathologist in Cyprus. She works at Spitaliou-Paramythas Preschool for the government of Education in Cyprus. Her research interests include language development and working with children with learning disabilities.

E-mail: pk19831@yahoo.com