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Phonological awareness and the minimising of reading problems: a South African perspective

A B S T R A C T In South Africa and in many other countries there is a concern that many learners in our schools do not have well developed reading abilities. Research in overseas countries has indicated that phonological awareness as a pre-reading skill influences the development of reading abilities. In order to verify overseas research, the authors undertook a research project to determine the relation between phonological awareness and reading success of a group of young learners in three primary schools. The results of the research findings verified overseas research in which a meaningful relation between preschoolers' phonological awareness and later reading success was indicated.

Key words: phonological awareness, phonological structure of language, emergent literacy, reading abilities, reading success

1. Introduction

There is a growing concern in many countries that learners lack the necessary language and reading abilities to make a success of their academic years at school and at tertiary-level institutions. Mathes, Torgesen and Allor (2001: 372) state, for instance, that six years ago about 40% of the children in the USA experienced significant problems in becoming competent readers and that more than 40% of fourth and eighth graders failed to read at a level considered basic to perform grade-level schoolwork.

In South Africa the results of the *National Report on Systemic Evaluation* based on assessment done in 2001 and 2002 affirmed the suspicion that the reading abilities of many young learners

are very poor. The average score for reading and writing of 52 000 grade three learners from 1 400 mainly urban schools was 39%. These statistics would be far worse in rural areas (Cape Times, June 12, 2003: 5).

In South Africa there are many students studying at tertiary level whose levels of literacy, including language abilities and reading abilities, are not in line with the academic standard demanded by their studies. The severity of the problem came to light in a research project conducted by the Student Service Bureau, of the University of the Orange Free State. In this project, the reading level of 60 first-year students (freshmen) was tested. Not one of the students' reading levels was higher than grade 8, and 13 of them were only able to read at grade 1 and 2 levels. However, these students required English language abilities which would allow them to read relevant academic material at university level (Orr 1997: 51). In another study conducted by the Unit for the Development of Language Abilities at the University of Pretoria, it was found that the language ability of 2 000 out of 6 000 first-year students was on the same level as or even lower than that of a grade 7 learner. Some students also had poorly developed reading and writing skills (Rademeyer 2001: 1). It is thus clear that there are many students in South Africa who might have the potential to study successfully at tertiary level, but lack the necessary literacy skills (which includes reading skills) to guarantee academic success.

The question arises whether something could be done to prevent or minimize reading problems. In many countries, there is a movement to identify at-risk learners and readers with a view to remediating the factors which could cause a barrier in the learning process or, as explained in this article, in the development of reading and reading skills. Phonological awareness as a key issue in identifying at-risk readers and a helpful tool in developing early reading abilities will be discussed.

2. Emergent literacy

Learners need to go through a stage of emergent literacy in order to become fluent readers using many reading skills. Choate and Rakes (2004: 56) explain that the building blocks towards emergent literacy are foundational language skills such as vocabulary concepts. Boucher (2004: 87) regards emergent literacy as the key to the new conception of literacy. It describes children's developing awareness of the inter-relatedness of oral and written language. Literacy is seen as a communicative competence.

Emergent literacy can also be defined as a child's knowledge regarding written language before he or she enters school. Thus, according to Brewer (1998: 122):

- literacy develops before children learn to read formally
- literacy encompasses the whole reading act and not only decoding abilities
- the social context within which literacy takes place is also important
- the child is an active role player within the framework of the development of his or her own literacy

The foundation of literacy and reading is best developed when young learners engage in activities involving the printed word and this involves listening, speaking, reading and writing. As far as reading is concerned both the whole word approach to the teaching of reading and phonics are mentioned in the New Revised Curriculum Statement (NRCS) of the Department of Education. Teachers are encouraged to teach the learners in their classes various techniques and strategies to unlock the 'code' of the written word. This could be done by:

- the development of various word recognition and comprehension skills such as phonemic awareness (sensitivity to the sounds of language),
- knowledge of letter-sound correspondence (phonics), and
- knowledge of blending (putting together two or three letters to make a sound) (Gauteng Department of Education, 2002: 22-23)

In the curriculum for grade 0 of the NRCS, it is stated that at centres for early childhood, a balanced literacy programme should be followed. According to the document on the Revised National Curriculum Statement written by the Gauteng Department of Education and the Gauteng Institute for Educational Development (Gauteng Department of Education, 2002: 22) a balanced approach to literacy development begins with children's emergent literacy which involves them in reading real books and writing for genuine purposes and it gives attention to phonics.

The development of phonological awareness could be seen as one of the ways to teach phonics. Brown (1998: 23) is of the opinion that phonological awareness should be taught first. In the New Revised Curriculum Statements (NRCS) for grade 0, as well as grades 1 to 3, guidelines on the development of phonological awareness are stated clearly. In the curriculum it is stated that phonological awareness activities should be conducted on a daily basis; a combination of phonological awareness and letters should be presented; opportunities to provide language development should be provided daily; children should be given the opportunity to listen to children's stories and to discuss them and write down what they hear, to enable them to participate actively in their own literacy; classical children's stories should be read and discussed; and there should be differentiation to accommodate initial phase enrichment programs in reading and writing and extra tuition in phonological awareness for identified at risk learners. (Department of Education 2002: 12-22).

3. What is phonological awareness?

Phonological awareness is a comprehensive term for a variety of skills on a broad continuum. These skills vary in degree of complexity and gradually develop as an infant matures and is exposed to spoken and written language; as well as to more opportunities to experiment with language. The skills should not be seen in isolation, but rather as a group of interrelated skills which develop over a period of time (Norris & Hoffman 2002: 7) Phonological awareness can simply be defined as a person's sensitivity to or explicit awareness of the phonological structure of his or her language, but it remains a complex skill (Foster, Erickson, Foster, Brinkman & Torgesen 1994: 127). Phonological awareness tasks usually precede other key skills of learning to read such as developing graphic knowledge, word recognition, grammatical knowledge and various text-level skills (Brown, 1998: 17 & 23).

According to Vaughn, Bos and Schumm (2003: 75-76), children need to listen in order to produce the sounds necessary for oral language, reading and written language. They need to decode words when reading and spell words when writing. Phonological awareness includes being able to

- rhyme (similarities and differences in word endings)
- identify similarities and differences in word beginnings (alliteration)
- blend (syllables and sounds put together to make words)
- segment (break words up into syllables and sounds)
- delete, add, substitute syllables and sounds (manipulate)

When young children are involved with various phonological awareness tasks, they come to realise that one can actually 'play' with language. They learn for instance that sounds in words can be changed, for example 'dog' can be changed to 'dig' and 'dig' can be changed to 'wig' (Brown, 1998: 24). When children 'play' with words in this way, the importance of the meaning of the words should, however, always be emphasised by the teachers.

Rhyming and alliteration skills develop first and blending, segmenting and manipulating sounds later. Phonological awareness, which is the ability to realize that words have sounds and that these sounds are used as building blocks to build words, should develop in preschool. Children that possess sound phonological awareness at an early stage, read at a younger age and read more books, have a larger vocabulary and store more knowledge than others (Vaughn et al 2003: 354).

Mathes et al. (2001: 376) distinguish the following seven different phonological awareness tasks:

- recognising rhyming words
- matching words on the basis of similar first sounds
- matching words on the basis of last sounds
- matching on the basis of middle sounds
- recognising words in an onset-rhyme format
- recognising words that are presented as individual phonemes
- counting the number of sounds in words

The importance of phonological awareness in early reading success is discussed in the Guidelines to Teaching Literacy in the Foundation Phase (Department of Education, 2001: 4 & 19). The Integrated Literacy Approach includes the phonics approach and requires an annual strategy layout of the progressive development of single sounds, to three-letter blends to double sounds and eventually to complicated spelling patterns. This plan needs to be combined with a daily programme which includes the application of phonics skills.

According to MacDonald and Cornwall (1995: 523), research has shown that inadequate development of phonological awareness (segmenting, blending and deleting letter sounds) leads to reduced reading and spelling development. It was established in a study that phonological awareness (pre-reading skills) tested in kindergarten is strongly related to reading development in grades 1 and 2. In some studies, it was found that phonological awareness precedes and leads to the development of word identification skills, whereas others found that the development of reading skills leads to phonological awareness.

Reading consists of two main processes, namely the so-called "bottom-up" and "top down" processes. The "top-down" process of reading is meaning based and it also regarded as a psycholinguistic view of reading. Reading is regarded as being global and this reading process relates to the look-and-say or the whole word approach. Whereas the "bottom-up" process consists of the phonetic decoding of printed symbols into the spoken form of words. The "bottom-up" process of reading is the behaviourist view of reading and it relates to the phonic approach to reading or phonics. Reading is thus seen as a collection of skills and words have to be decoded (Flanagan, 1995: 12, 27 & 30).

Decoding is known as the sounding out of letters and depends on phonological awareness (Bouwer 2004: 92). Young learners should master both the processes when they start reading because both are equally important. Decoding provides the skills which a reader can use to

decode a unfamiliar word and the faster the decoding can be done, the better a person can read. It is thus clear that if phonological awareness is well developed, it will assist a young learner in the reading process.

When reading new words, phonological awareness can also support children in improving the analogies formulation process. Once children realize that rhyme and onset can be heard and seen in one word, they can be guided to recognise rhymes and onsets in other words. They thus learn to make analogies. Analogies in reading involve using the spelling pattern of a known word as a basis for reading a new word containing a similar set of symbols or spelling pattern. Once young students have acquired phonological awareness of syllables, onsets and rhymes and are able to make analogies, they will be able to learn about phoneme-grapheme relationships and how to analyse and synthesise sounds in order to read new words (Browne 1998: 23)

In the past, children's phonological awareness was assessed by asking them to clap the number of syllables in words. At present there are a variety of tasks which can be used to assess phonological awareness. These tasks may vary from simple to extremely difficult, for example:

- rhyme – recognising words that rhyme or supplying rhyme words
- choosing words or sounds that do not fit – identifying words that are the same or different, based on beginning, middle or end sounds
- synthesis – identifying a word that is pronounced slowly according to the different sounds or syllables
- phoneme segmentation or analysis – pronouncing separate sounds in one-syllable words
- manipulating phonemes – identifying a word after certain sounds have been omitted, added or moved (Snider 1997: 204)

Research has indicated that good readers score higher compared to poor readers when performing a variety of phonological awareness tasks, even when the effects of intelligence and social class are controlled (Foster et al. 1994: 126). Muter's statement (2004: 3) that phonological awareness tasks are stable and robust predictors of future reading skills makes perfect sense.

In order to verify overseas research, the authors of this article undertook a research project to determine the relation between phonological awareness and reading success among young learners in three primary schools. An investigation into the current debate on phonological awareness, the whole language approach, reading readiness and whole brain research was not undertaken because it is a given fact that teachers in South Africa are required to develop young learners' phonological awareness. To assess the effect of well-developed phonological awareness abilities on later reading success, the phonological awareness of a group of children at preschool level was tested, and the reading abilities of the same group was assessed again approximately a year later. When the reading assessment was done, the children had almost complete their grade one year. The research is regarded as a pilot study and aims at testing the same sample again at a later stage to access reading skills.

4. Aim of the research

The aim of this research was to determine whether phonological awareness can assist in identifying preschoolers at risk of manifesting reading problems once they enter school. If at-risk readers are identified timely, a reading readiness programme in which phonological awareness is stressed, can be designed to minimise possible future reading problems. Such a

reading readiness programme could be used by classroom teachers. It is foreseen that such intervention could assist thousands of learners in South Africa in developing the necessary reading skills to guarantee success in their academic careers.

5. Method of research

5.1 Sample

Although many young South African learners study through the medium of English as their second language, this study was conducted with learners who studied through the medium of their mother tongue or home language. The effect that a second language could have on reading acquisition and reading ability was thus eliminated. The home language of learners in the study was Afrikaans. Afrikaans medium schools in the Rustenburg area was selected since Afrikaans is spoken by a large proportion of the population of Rustenburg. Quite a number of Afrikaans medium schools exist in the area. Two of the schools selected served a more affluent community and the third school was located in a lower-income community.

A group of grade 0 learners was selected at random from grade 0 classes at three primary schools. The schools are referred to as school A, school B and school C. When the research was conducted two of the schools (schools B and C) had three grade 0 classes and school A had four grade 0 classes.

To ensure that a representative sample of the grade 0 learner population was included, three learners each from the categories of high, average and below average achievers were selected at random from each of the three classes at schools B and C. This resulted in 27 learners being selected at each school. At school A, with four grade 0 classes, two learners in each achievement category were randomly selected from each category in every class. This resulted in twenty four learners being selected. In total the study initially consisted of seventy eight learners. During the time lapse between the first and second assessment stages, seven learners had, however, moved to other areas with the result that the research analyses were performed on the assessment of seventy one learners.

During phase 1 of the study, the preschoolers' level of phonological awareness was assessed. In phase 2, the reading abilities of the same group of young learners, having almost completed grade 1, were assessed to determine whether a positive correlation existed between phonological awareness at preschool level and reading success at a later stage.

Neither the sample group, nor the circumstances were manipulated in any way. To avoid bias, the teachers at the three schools were not informed of the fact that some of the learners in their class were part of a research project.

5.2 Instrumentation

A phonological awareness test was used as measuring instrument during the initial phase (phase 1) of the research and this test represented the pre-test. The learners were evaluated towards the end of their preschool year (grade 0).

During the second phase of the research, a reading test was implemented as measuring instrument. The assessment of the reading test (phase 2) was executed more or less a year later towards the end of the learners' first formal school year.

Phase 1

A number of phonological awareness tests are referenced in the literature, but none has as yet been standardised for South African conditions. For the purpose of this research, an overseas phonological awareness test was translated into Afrikaans taking cultural differences into consideration. The overseas phonological test was designed in the United States and it was designed after in-depth research. Foreign concepts and objects were substituted by South African concepts and objects. In the identification of rhyme words in subtest 1, words like 'coat' and 'boat' were for example replaced by words like 'hoed' (hat) and 'voet' (foot) which are words known to all Afrikaans speaking young children. Similarly, in subtest 2, the picture concept 'olifant' (elephant) was used to count syllables, since all South African young children know elephants.

The test consists of five subtests, each supplemented with an example to ensure that the preschoolers understand what is expected of them. Pictures are provided to ensure that a child with a weak auditory memory and who has difficulty remembering words, is supported. The following subtests were used:

Subtest 1: Identification of rhyme words

Identifying rhyme words is a crucial aspect of phonological awareness. It is also an assessment standard in grade 1 for learning outcomes 1, 3 and 6 of the NRCS (Department of Education 2002: 16, 19 & 22).

Subtest 2: The counting of syllables

Identifying syllables is one of the easier tasks on the continuum of phonological awareness. The ability to recognise the syllables in multi-syllable words in grade 1 is an assessment standard of learning outcome 6 of the NRCS (Department of Education 2002: 22).

Subtest 3: Joining words (pictures provided) starting with the same sound

According to the NRCS, this ability is an assessment standard of learning outcomes 1, 3, & 6 (Department of Education 2002: 16,19 & 22).

Subtest 4: The counting of phonemes

As far as preschoolers are concerned, the counting of phonemes in a word is a difficult task. In the assessment standards of learning outcomes 1 and 6 of the NRCS, grade 1 learners are expected to recognise that words consist of various sounds (Department of Education 2002: 16 & 22).

Subtest 5: The discrimination of sounds in similar sounding words: word comparison

This ability test requires testees to discriminate between similar sounding words. The young child has to identify the longer word in a similar sounding words pair, like for example 'een' (one) and 'been' (bone). It is a relatively difficult task for young children. If young children are able to discriminate between the subtle differences in words, they have a sophisticated level of phonological awareness.

Phase 2

Most of the spelling and reading tests administered in South Africa are outdated. It was thus decided to use the reading test of the subject committee for remedial teaching at the Free State

Department of Education. It was designed by Esterhuyse and Beukes (1997). During phase 2, the grade 1 research subjects were presented with the list of fifteen words and they were asked to read the list.

6. Analysis strategy, data analysis and interpretation of analysis results

Statistical analysis was performed by the Research Support Unit, Department of Computer Services at Unisa. The SAS^a statistical package, version 9.1 (TS1M3), was used in the analyses.

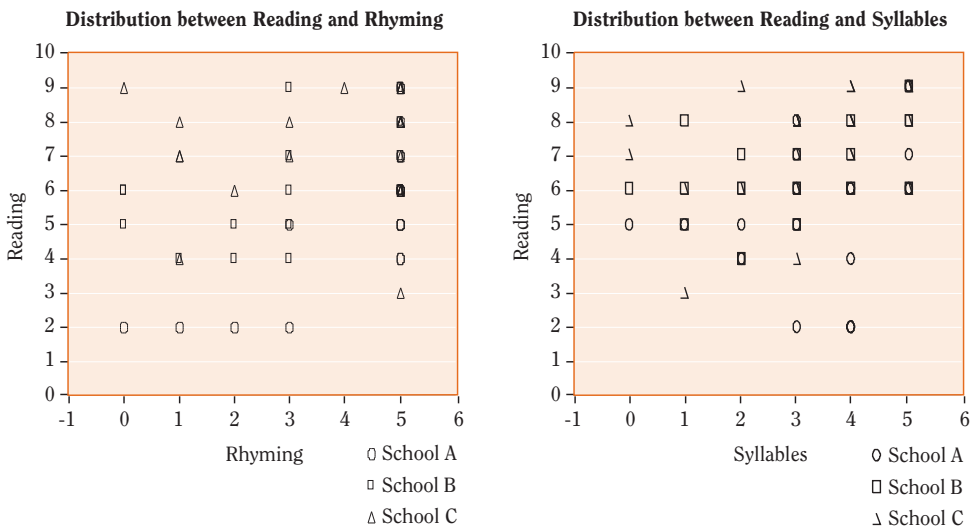
The research data on the sampled learners consisted of the five pre-school phonological element scores (rhyming, syllables, beginning sounds, phonemes and word lengths), the grade one stanine score (reading) and the specific school the learner was enrolled at when reading-evaluation was undertaken. The aim of the research was to establish whether elements of phonological awareness could be used to predict reading success. In conjunction to this the possibility of other factors affecting reading success was also investigated.

A number of analysis strategy steps were followed in the analysis. The various analyses, interpretation and motivation are described in each step.

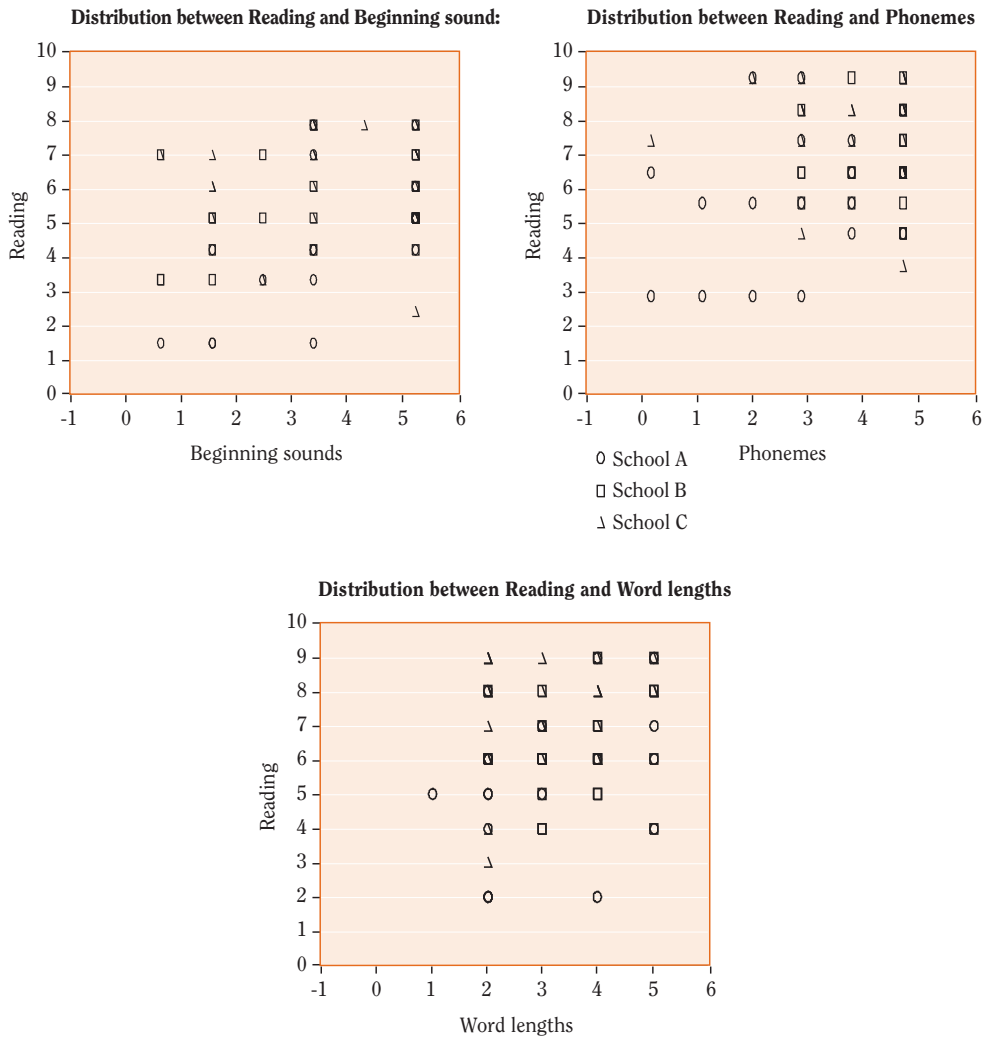
In an initial exploratory step in the analysis strategy, scatter plots of reading success (stanine scores) against the individual phonological awareness components were compiled. The plots were used as an initial visual indication of possible relationships between reading success and the individual phonological elements. Possible relationships would show up as trends in the scatter plots.

Relationships between reading success and the individual phonological elements did not seem promising. The scatter plots are presented in Figure 1.

Figure 1: Scatter plots of Reading versus individual Phonological Awareness Elements.



^a Copyright (c) 2002-2003 by SAS Institute Inc., Cary, NC, USA. NOTE: SAS (r) 9.1 (TS1M3)



In a next step in the analysis strategy a visual indication of a positive linear trend emerged from a scatter plot between reading success and a calculated composite phonological variable.(figure 2.). The possibility of the calculated variable being a predictor of reading success was then further substantiated.

The composite phonological variable was calculated by adding the five phonological responses for each learner into a 'score total' variable for each pupil. Averaging the five phonological score elements for each learner resulted in the 'score average' variable which constituted the required composite variable.

Averaging the five score elements resulted in a variable of the same order magnitude as the reading score and individual phonological element responses. This facilitated comparison among responses in further analyses.

The possibility of the school (at which the pupils was enrolled) as another factor that could

Figure 2: Scatter plot of Reading versus Average Composite Phonological score.



influence reading success was suspected on visual examination of Figure 2. Responses seemed to group together according to school.

To substantiate the visual impressions gleaned from the scatter plots, correlations between reading success and the various phonological variables were calculated in a next step in the analysis strategy. Pearson's correlation coefficients and their associated probabilities are presented in the first two rows of the correlation matrix reported in Table 1.

Significant correlation between reading scores (stanine scores) and any of the phonological variables, namely rhyme; syllables; initial sounds' or beginning sounds; phonemes; word lengths and score average; identified the particular variable as a potential reading success predictor.

Table 1 also reports on summary statistics of all variables in the data set. The 'total difference' and 'mean difference' variables reported on in Table 1 will be discussed in a following step in the analysis strategy.

Table 1: Summary statistics on reading success and phonological awareness:

The variables, number of responses for each variable; mean; standard deviation; Pearson's correlation coefficients; and associated probabilities are presented in the body of the table.

Variables	N	Average	Standard Deviation
Reading	71	6.40845	1.87904
Rhyming	71	3.87324	1.70654
Syllables	71	3.21127	1.45323
Beginning sounds	71	3.36620	1.75857
Phonemes	71	3.94366	1.37204
Word lengths	71	3.22535	1.13637
Score total	71	17.61972	4.36010
Score average	71	3.52394	0.87202
Total difference	71	11.21127	3.77933
Average difference	71	2.88451	1.62469

Pearson's correlation coefficients presented below; (associated probabilities included)

Significant correlations are indicated by probabilities less than 0.001; or 0.01; or 0.05; depending on the significance level used. n=71

	Reading	rhyme	syllables	bg. sounds	phonemes	lengths	totscore	scoreavg	totdiff	avge.diff.
reading	1.00000	0.35050	0.30277	0.32156	0.23070	0.24396	0.50398	0.50398	0.08423	0.88605
		0.0027	0.0103	0.0062	0.0529	0.0403	<.0001	<.0001	0.4849	<.0001
rhyme	0.35050	1.00000	0.13768	0.43459	0.25316	0.10334	0.71917	0.71917	0.65542	0.01938
	0.0027		0.2522	0.0002	0.0332	0.3911	<.0001	<.0001	<.0001	0.8726
syllables	0.30277	0.13768	1.00000	0.1482	-0.05126	0.29083	0.50662	0.50662	0.43394	0.07825
	0.0103	0.2522		0.2175	0.6712	0.0139	<.0001	<.0001	0.0002	0.5166
bg.sounds	0.32156	0.43459	0.14817	1.00000	0.19222	0.17972	0.73014	0.73014	0.68247	-0.01999
	0.0062	0.0002	0.2175		0.1083	0.1337	<.0001	<.0001	<.0001	0.8686
phonemes	0.23070	0.25316	-0.05126	0.19222	1.00000	-0.10169	0.44770	0.44770	0.40180	0.02652
	0.0529	0.0332	0.6712	0.1083		0.3988	<.0001	<.0001	0.0005	0.8262
lengths	0.24396	0.10334	0.29083	0.17972	-0.10169	1.00000	0.43850	0.43850	0.38459	0.04680
	0.0403	0.3911	0.0139	0.1337	0.3988		0.0001	0.0001	0.0009	0.6984
totscore	0.50398	0.71917	0.50662	0.73014	0.44770	0.43850	1.00000	1.00000	0.90310	0.04614
	<.0001	<.0001	<.0001	<.0001	<.0001	0.0001		<.0001	<.0001	0.7024
scoreavg	0.0398	0.71917	0.50662	0.73014	0.44770	0.43850	1.00000	1.00000	0.90310	0.04614
	<.0001	<.0001	<.0001	<.0001	<.0001	0.0001	<.0001		<.0001	0.7024
totdiff	0.08423	0.65542	0.43394	0.68247	0.40180	0.38459	0.90310	0.90310	1.00000	-0.38730
	0.4849	<.0001	0.0002	<.0001	0.0005	0.0009	<.0001	<.0001		0.0008
avge.diff.	0.88605	0.01938	0.07825	-0.01999	0.02652	0.04680	0.04614	0.04614	-0.38730	1.00000
	<.0001	0.8726	0.5166	0.8686	0.8262	0.6984	0.7024	0.7024	0.0008	

The correlations between reading and the relevant phonological variables reported on in the first row of the correlation matrix in Table 1 proved to be statistically significant. This can be established by studying the associated significance in row two.

With a significant correlation of 0.504, the composite phonological awareness variable seemed to be the most likely predictor of reading success.

The next step in the analysis strategy was to establish the nature of the established relationship between reading success and the composite phonological awareness variable. Linear regression on the composite phonological variable, with reading success as the dependant variable, was carried out. The regression results are presented in Table 2.

Table 2: Phonological awareness ('score avg') regressed against reading score.

Source of variation; degrees of freedom; sum of squares; mean sum of squares; associated F-statistic and probabilities are included in the body of the table. Estimated intercept and slope regression coefficients for the linear prediction equation are reported on in the parameter estimates section.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	62.77542	62.77542	23.49	<.0001
Error	69	184.37951	2.67217		
Corrected Total	70	247.15493			
Root MSE		1.63468	R-Square	0.2540	
Dependent Mean		6.40845	Adj R-Sq	0.2432	
Coeff Var		25.50814			
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	2.58154	0.81304	3.18	0.0022
Score avg	1	1.08597	0.22406	4.85	<.0001

The results of the regression is valid because the regression proved to be significant with a probability of less than 0.0001 associated with the F-statistic of 23.49.

The positive, linear relationship between phonological awareness and reading success can be described by the following relation:

$$\text{Reading score} = 2.5815 + 1.0860 * (\text{score avg.})$$

This implies that reading success increases as phonological awareness improves.

The relation identified above explains twenty five percent of the variation in the reading success variable. (Deduced from the R-square value of 0.254 in Table 2.)

In the scatter plot discussion, the possible effect of schools (A; B; or C) – in conjunction to the effect of the composite phonological awareness aspect – on reading success had been introduced. As a further step in the analysis strategy the possibility of improving the reading success prediction by including the effect of school (in conjunction to the composite phonological variable's effect) in the regression model was investigated.

Analysis results are reported on in Table 3.

Table 3: Linear regression results. Effect of school included. Phonological awareness ('score avg') and effect of school regressed against reading score.

Source of variation; degrees of freedom; sum of squares; mean sum of squares; associated F-statistic and probabilities are included in the body of the table. Estimated intercept, slope and school effect regression coefficients for the linear prediction equations are listed under the parameter estimates heading.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	104.01447	52.00724	24.71	<.0001
Error	68	143.14046	2.10501		
Corrected Total	70	247.15493			
Root MSE	1.45086	R-Square	0.4208		
Dependent Mean	6.40845	Adj R-Sq	0.4038		
Coeff Var	22.63986				
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	0.78606	0.82782	0.95	0.3457
Scoregem	1	1.03120	0.19925	5.18	<.0001
School	1	0.95394	0.21552	4.43	<.0001

The regression again proved to be statistically significant with an improved prediction model. By including the effect of school in conjunction to phonological awareness as predictors of reading success into the model, the model prediction improved from the aforesaid twenty five percent to forty two percent. Improved prediction equations can be derived from the parameter estimates in Table 3.

The results thus established that reading success of grade 0 learners are positively related to their phonological awareness as a composite entity, and that the school which the learner attends effects reading skills as well.

To substantiate the above implication that the three schools influenced reading success to different extents, a Kruskal-Wallis non parametric analysis of variance test was run on the calculated difference between reading score and the average phonological score for each pupil

(called 'avg diff' in Table 4). The type of school was entered as a classifying variable in the analysis. The test was done to establish whether the means of the abovementioned differences differed significantly for the three schools. It was reasoned that the mean differences for the three schools would differ significantly according to the effect that the schools had had on reading success. The school with the greatest (positive) mean difference could thus be identified as most influential.

Table 4 below reports on the analysis.

Table 4: Analysis of variance for variable average difference classified by the variable school.

WILCOXON SCORES (RANK SUMS) FOR VARIABLE AVERAGE DIFFERENCE CLASSIFIED BY VARIABLE SCHOOL						
School	mean difference	N	Sum of Scores	Expected Under HO	Std Dev Under HO	Mean Score
A	1.890000	20	483.50	720.0	78.144465	24.175000
B	2.736000	25	829.00	900.0	82.974960	33.160000
C	3.792308	26	1243.50	936.0	83.693372	47.826923
				Chi-Square	15.6095	
				DF	2	
				Pr > Chi-Square	0.0004	

The test proved to be significant with a probability of less than 0.001 attached to the chi-square value of 15.6. Therefore schools affected reading success to different extents. Table 4 indicates that the mean difference for school C was 3.78 as opposed to 1.89 for school A and 2.74 for school B. The impact of the teaching approach to elementary reading on reading success, in conjunction to the effect of phonological awareness, was most noticeable for school C.

7. Findings

The results of the research findings verified overseas research in which a meaningful relation between preschoolers' phonological awareness and later reading success was indicated.

The components in the phonological awareness test had a joint effect on the reading success of the learners and the various aspects should therefore be regarded as a composite entity. The combined effect of the five phonological elements thus jointly contributed towards explaining future reading success: Solid phonological awareness goes hand in hand with future reading success.

In the second phase of the phonological awareness study, the tutoring approach to elementary/or initial phase reading differed at the various schools. Concurrent to evaluating reading skills, the effect of initial phase reading approaches were also captured in the stanine reading ability score.

The Kruskal-Wallis non-parametric analysis of variance test which was conducted on the difference between stanine-score/reading skills and phonological awareness indicated that significant differences in reading skills existed between the three schools.(The mean differences were significantly greater than zero and differed from one another). This indicates that the different approaches the schools followed had an effect on reading skills. The initial phase reading approach followed, combined with and related to phonological awareness thus also contributed to future reading success. Every teacher has his or her own personal view on reading methodology and this does influence the rate and the success of elementary reading abilities

of the learners in their classes. The reading methodology used in school C appears to have had the largest positive influence on the development of phonological awareness which in turn positively influenced learners' reading abilities.

8. Recommendations

According to McEwan (2002: 33-34) children can acquire phonological awareness in any of four ways. Some children are genetically blessed with an innate ability to understand and use phonological awareness skills. Some children's parents introduce them to word games, stories and nursery rhymes from early childhood. Some children have a genetic phonological ability and come from stimulating homes. The fourth group depends on teachers to provide a well-researched curriculum in an explicit, systematic way. The vital role that teachers play in the development of phonological awareness of learners, especially at-risk learners, should therefore not be underestimated.

Phonological awareness is one of the variables in the teaching-learning situation that teachers can truly develop because it is reasonably independent of general intelligence (Vellutino et al 1996: 601 & 632). Teachers in centres for early childhood education have always read nursery rhymes and played word and listening games with the children in their classes, but uncertainty exists as to whether children actually learn from these incidental activities. The key to phonological awareness training is not age- or so-called "ripening"-related, but lies in practising. The most appropriate time to practise phonological awareness is before formal reading commences at school. Preschool teachers should thus be trained to apply phonological awareness techniques in the classroom.

The differences established in the reading success of learners at the three schools point to the fact that reading methodology at school should be aimed at developing and stimulating phonological awareness. Considering the results of the three schools, school C had the largest mean difference of 3.79, and school A the smallest mean value of 1.89. In addition to phonological awareness, the tutoring approach to elementary reading used at school C had a positive influence on the learners' reading development. This necessitates further research into initial phase reading approaches which might assist teachers in selecting the reading methodology best suited to the needs of the learners in their classes.

While assessing reading performance during the second phase of research, qualitative observations were conducted by one of the researchers. It was noticed that the learners at schools B and C read the list of words in the reading test of phase two with greater speed and accuracy than the learners in school A.

When faced with a list of word not set against the normal background of their familiar readers, learners at school A were forced to decode all the time, which took longer. The readers used at school A were based on the whole word approach, which is a "top-down" reading approach. These readers are beautifully illustrated, but illustrated contextual aspects assist readers who experience difficulty decoding words. They are thus not truly trained to decode but they had less problems understanding what they read. Frequency of decoding leads to ease and speed of application - which these learners lacked. Decoding words was done with more ease by learners at schools B and C. It is thus clear that phonics, which relies on phonological awareness should not be neglected.

The influence that parents, guardians and caretakers have on the phonological awareness development of young children should also not be underestimated. Examples of the way in which these adults can stimulate phonological awareness, for example, by means of various games, should be made available at centres for early childhood development.

9. Conclusion

Phonological awareness, researched in this project, is but one of the pieces in the reading puzzle. To become successful readers, young learners need to develop all aspects and skills which constitute the reading process. This includes both the phonic and the look-and-say reading approaches. The findings gained from the research can assist teachers in preparing preschoolers for formal reading. The importance of well developed phonological awareness skills which emerged from the study can be of added value when teaching elementary reading to initial phase readers. At-risk readers should be identified timely and with the assistance of well designed reading readiness programmes in which phonological awareness is stressed. In this way young learners can be assisted to develop their reading abilities to the fullest and to succeed in their academic careers.

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