

Action Research Project

Phonological Awareness and Reading Acquisition

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Spoken language is made up of discrete sounds. Children develop the ability to understand spoken language at a young age, however they are often unaware that spoken language is made up of words which are made up of syllables which themselves are made up of discrete sounds. This awareness of sounds is crucial to early reading development. The relationship between phonological awareness and reading ability has been well established through research over the past twenty years. However, there are many elements of phonological awareness. This project examines the performance of both good readers and poor readers in order to determine which elements of phonological awareness are absent and which are consistent in good and poor readers. Students were tested on levelled reading passages and on a series of phonological tasks and their performance on individual test items was analysed. Significant differences were evident in the performance of the two groups, with the good readers proving to have a greater phonological awareness than those students who are poor readers. The question then arises of the relation of phonological awareness to reading – how much phonological awareness is needed to learn to read and how much is acquired as a result of learning to read? Research supports phonological awareness as both causal to reading development and a consequence of reading development. This has important implications for teaching. Phonological awareness is not an innate ability and needs to be included in teaching programs prior to reading instruction, as well as being taught in relation to text.

Introduction

Many students in the middle years of primary school still have poor phonological skills, that is they have limited awareness of sounds in speech and have difficulty in manipulating these sounds. This difficulty with phonological awareness has an impact on a student's ability to learn to read, as learning about letters and the sounds they represent requires an awareness of the phonemes in words. According to John Munro "many readers display reading disabilities because their phonological knowledge restricts their ability to learn written word patterns" (Munro, 1998, p.4)

During the past two decades, an abundance of research supporting this correlation between phonological awareness and reading acquisition has been collated. In 1995 Smith, Simmons & Kameenui published a synthesis of some of this research. They state that "the presence of phonological awareness is a hallmark characteristic of good readers while its absence is a consistent characteristic of poor readers." (Smith; Simmons; Kameenui, 1995) Their summary, however, concedes that the scope of their review "did not provide an in-depth examination of any one dimension of phonological awareness." (Smith, Simmons, Kameenui, 1995)

Phonological awareness is an awareness of sounds and this ability is revealed by tasks such as rhyming, matching sounds, deleting sounds, blending or segmenting sounds. According to Adams (1990) there are five levels of difficulty in phonological awareness:

- awareness of rhyme and alliteration
- comparing and contrasting the sounds of words for rhyme and alliteration
- blending and splitting syllables
- full segmentation of component phonemes
- adding, deleting and moving phonemes

Many studies have found that certain levels of phonological awareness are essential to the development of early reading ability such as an awareness of rhyme, the ability to blend sounds, to isolate initial and final consonants and to distinguish phonological elements smaller than syllables. Other more difficult elements of phonological awareness are developed as a result of learning to read, that is "the relationship between phonemic awareness and learning to read is most likely one of reciprocal causation or mutual facilitation (Yopp, 1992, p.697)

The present investigation aims to examine the performance of good readers and poor readers on a phonological awareness test to see if their results support this hierarchy of levels of difficulty and to examine which elements of phonological awareness are absent and which are consistent for both poor readers and good readers.

Method

This study tests students' word reading accuracy in prose reading and their performance on a phonological awareness test. The participants are Year 3 and 4 students who were chosen from a number of volunteers after the purpose of the testing was explained to their class. The students are from a variety of ethnic backgrounds with varying degrees of competency in spoken English. Half of the students tested are successful readers and the other half have a history of reading difficulties.

The Sutherland Phonological Awareness Test (Nielson, 2000) diagnostic tool was used to assess phonological knowledge. It includes a range of tasks with increasing levels of difficulty, is easy to administer and gives an overview of a student's level of ability. The students were tested on Items 1 to 12 only as these related to receptive rather than productive phonological skills.

Reading aloud was assessed using the Neale Analysis Test of Reading Ability (Neale 1998). This test enables a reading level to be established in a short amount of time and provides norms for reading accuracy, comprehension and reading rate. However, the comprehension questions were not administered due to the length of time required to administer both reading and phonological awareness tests to each student and because these results were not essential for the purposes of the study.

Testing took place on a one-to-one basis outside of the classroom. Both tests were administered in one sitting but students were given the option to take a break if required. Time was spent chatting to students to make them feel at ease before the tests were administered and it was explained that the test was for teacher research only. The Sutherland PA test was administered first. Only items 1 – 12 were included in this study. Students were then asked to read a practice passage in the Neale test to give them confidence before prose reading was assessed on the passages in Form 1. Only scores for accuracy and for reading rate are included in this study as the research relates to reading accuracy and not to comprehension ability.

Results

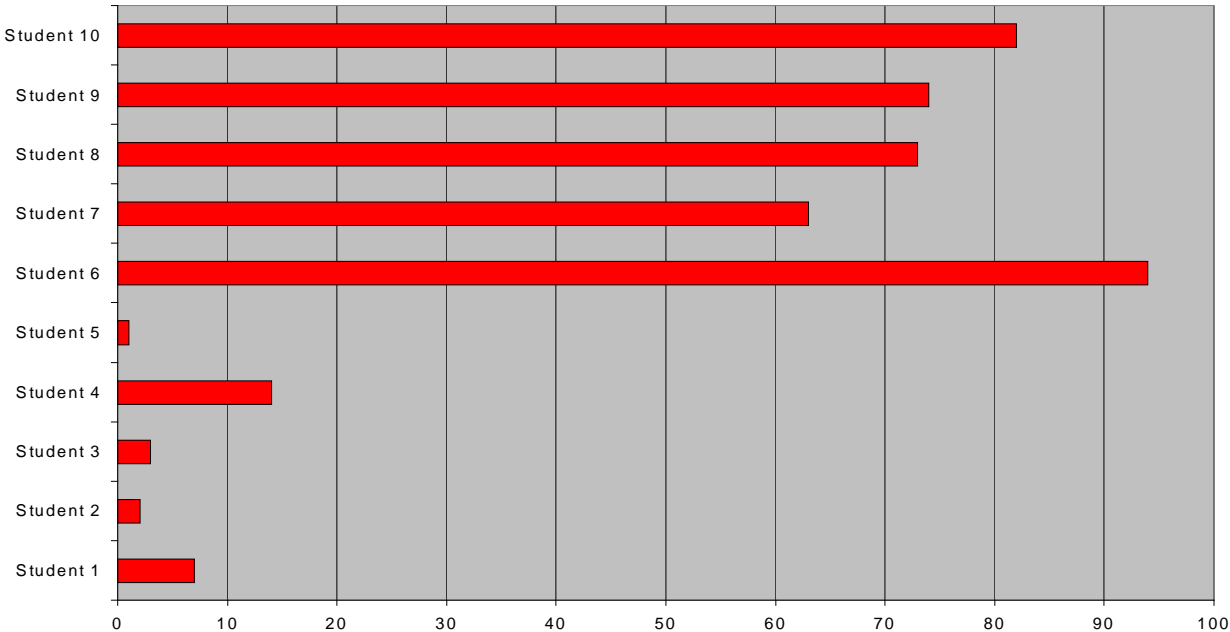
The results are described in 3 sections. The first section relates to the Sutherland Phonological Awareness Test (Nielson, R. 2000), the second relates to the Neale Analysis of Reading Ability and the third relates to the correlation between the two.

Raw scores only are given for each item of the Sutherland test, whilst both percentile ranking and stanines are given for reading accuracy and reading rate for the Neale test. Reading errors were also analysed and percentages calculated for the different types of errors. This data is shown in Table 1.

Table 1																								
Sutherland Phonological Awareness Test													T ₀	Neale Analysis of Reading Ability										
Student	Age	YOS	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Item11	Item12	Total	Percentile Ranking		Mispronunciation	Substitutions	RefusalsRF	Additions	Omissions	Reversals	
																Accuracy	Rate							
Student 1	8	4	4	4	4	4	4	2	3	1	0	1	0	1	28	7	2	8	2	50%	28%	6%	11%	6%
Student 2	7	4	4	4	4	4	4	4	4	1	1	1	1	1	33	2	1	0	2	74%	21%	5%		
Student 3	8	4	4	4	4	4	4	4	4	3	4	1	0	3	39	3	1	6	2		25%	58%	8%	8%
Student 4	8	4	4	4	4	4	2	2	3	0	2	1	1	31	14	3	37	4	38%	54%	8%			
Student 5	10	5	4	4	4	4	2	4	3	0	0	0	1	30	1	1	0	0	28%	44%	22%	6%		
Student 6	8	4	4	4	4	4	4	4	4	2	4	4	7	49	94	8	89	7	75%	17%		8%		
Student 7	8	4	4	4	4	4	4	4	4	3	4	4	7	50	63	6	70	6	75%	25%				
Student 8	8	4	4	4	4	4	3	4	4	3	4	4	7	49	73	6	91	8	62%	30%		4%	4%	
Student 9	8	4	4	4	4	4	4	2	3	3	4	4	6	46	74	6	77	6	72%	28%				
Student 10	9	5	4	4	4	4	4	4	4	3	4	4	7	50	82	7	80	7	75%	25%				

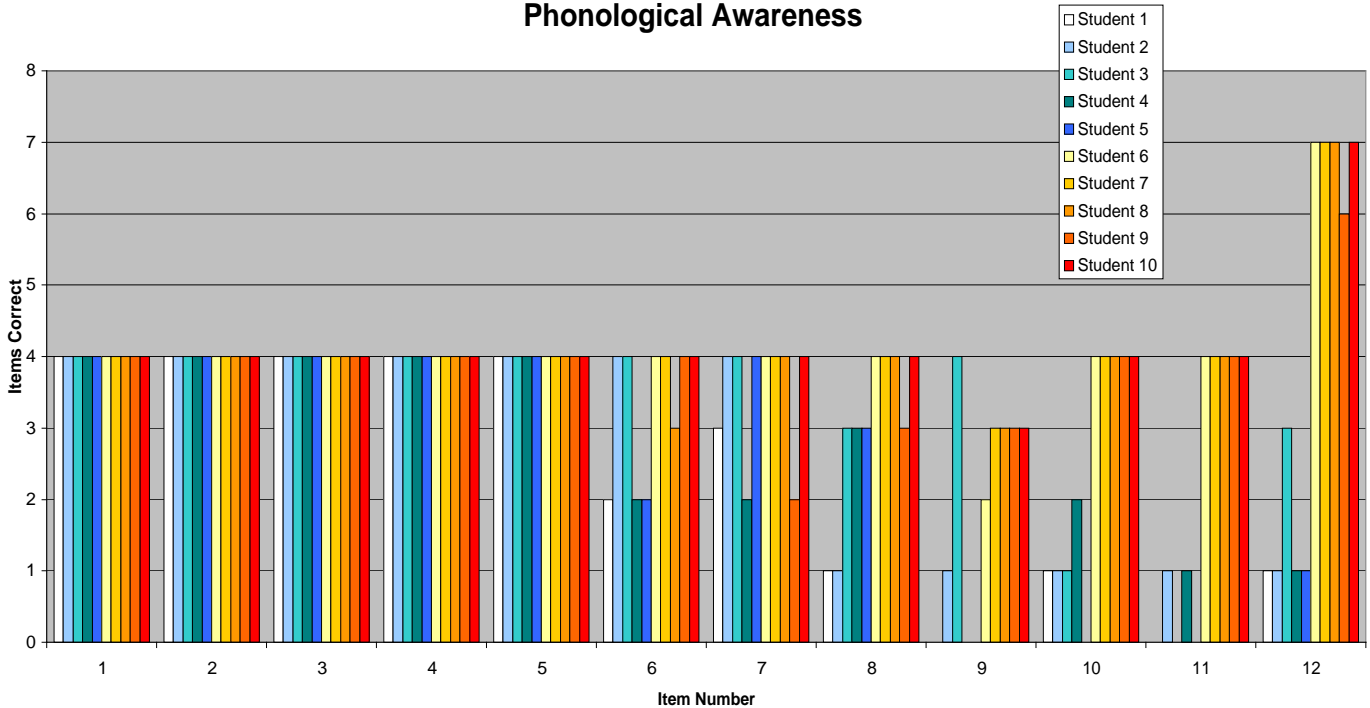
The Neale test results support the initial categorisation of students into those who are successful readers and those who have a history of reading difficulties. For the purposes of this investigation, students whose percentile ranking for reading accuracy is below 15 are referred to as “poor readers”. The other students in the group, who have a percentile ranking of 63 or above, are referred to as “good readers.” 50 % of the group are poor readers and 50 % are good readers. (Figure 2)

Figure 2
Neale Analysis - Percentile Ranking



Two of the poor readers scored a reading rate of 0 indicating that their prose reading rate was far below other students of this age level. These same students were also ranked in the bottom 1 or 2 percentiles for reading accuracy for their age group indicating a direct relationship between reading accuracy and reading rate.

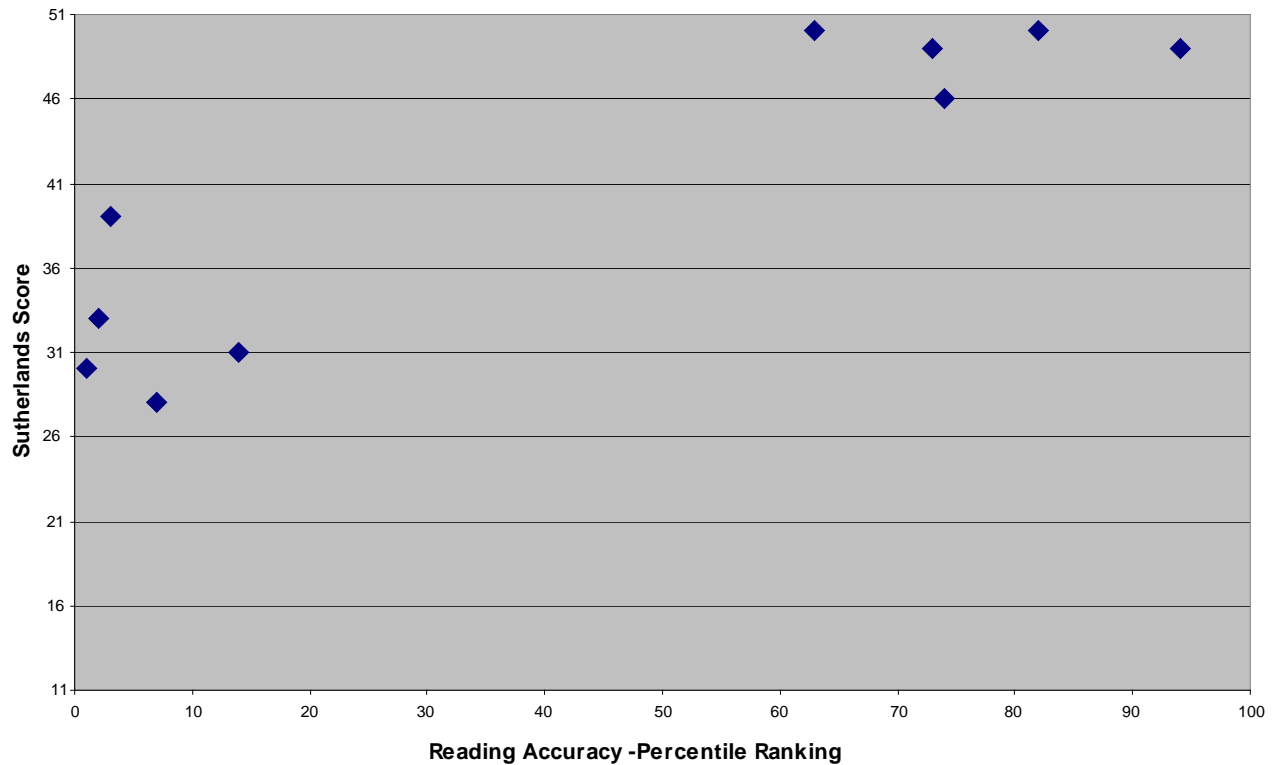
Figure 1
Phonological Awareness



In the Sutherland test, all students obtained perfect scores on Items 1-5, however, there were significant differences in the performance of the 2 groups of students on Items 6-12 as shown in Figure 1. (The scores for individual word items within the 12 tasks are given in Table 2 of the Appendix) The performance of the good readers was noticeably better than that of the poor readers on the segmentation (Items 6 and 9) and deletion tasks (Items 8, 10 and 11). Only 40 % of the poor readers could segment 3-sound words (see Table 2 in the Appendix) whilst 95% of the good readers could complete this task correctly. Only 25% of the 4-sound segmentation tasks given to the poor readers were correct, whereas 70% of the items were correct for the good readers. In the deletion tasks, the poor readers achieved only 55% accuracy on the deletion of the initial phoneme for 3-sound words, whilst the good readers achieved 95% accuracy. The poor readers performed poorly (17% accuracy) on the deletion items with 4 and 5-sound words, whilst the good readers scored with 100% accuracy on these items. All of the poor readers read only 1 word correctly out of 7 on the non-word reading item (Item 12), except for one student who scored 3, whilst the good readers read all 7 words correctly. None of the poor readers could read the 5-sound or 7-sound words accurately.

Figure 3 shows clearly the correlation between reading accuracy and phonological awareness. Students who scored a percentile rank less than 20 all had a total score on the Sutherland of less than 39 out of a possible 51. All students with a percentile ranking over 60 scored at least 49.

Figure 3
Correlation between Reading Accuracy and Phonological Awareness



Discussion

The results strongly support the theory that “phonological awareness explains significant differences between good and poor readers”. (Smith; Simmons; Kameenui, 1995) The good readers’ performance on the phonological awareness test was noticeably better than that of the poor readers. The research also supports other investigations relating to the development of phonological awareness and the complexity of dimensions of phonological awareness.

Adams (1990) states that most young children can rhyme but not delete. This was true of the poor readers in the sample group. All students completed the rhyming task with 100% accuracy however, none of the poor readers completed the deletion items of the phonological awareness test with 100% accuracy. The good readers, on the other hand, handled the deletion items with ease, completing items correctly in 98% of the given examples. These results support Adams’ hierarchy of levels of difficulty in that the data indicates that students are able to rhyme first, then develop the skill of deletion at a later stage. The results, however, do not prove conclusively that the ability to delete a phoneme is essential in learning to read. The fact that the poor readers had difficulty with the deletion tasks might indicate that it is this skill which assists in reading acquisition or that it is developed as a consequence of learning to read.

All students were able to identify initial and final phonemes even if they were unable to delete the phoneme. It is difficult, however, to determine if this ability is a result of the fact that the teaching of this skill is a major focus in the school’s reading program or to developmental trends.

The findings of the study endorsed the conclusion made by Smith; Simmons; Kameenui (1995) that “for the majority of children, syllable segmentation is easier and often develops without instruction, in contrast to phoneme segmentation.” For example, the entire sample group scored

100% for the syllable counting task (Item 1) whereas only one student scored 100% on the task phoneme segmentation (Item 9).

Some of the results of this study do not comply with Adams' levels of difficulty in phonological awareness. According to Adams, deletion of phonemes is a more difficult task than segmenting phonemes. This is not true of the total sample group. The poor readers were more competent in segmenting phonemes than deleting phonemes, however, the good readers could all delete phonemes but could not always segment individual phonemes.

When determining the accuracy of results of this study, there are a number of other variables that need to be considered. For example, the performance of the good readers on the phonological awareness test may not indicate the ability of the students accurately due to a number of factors. The students who are good readers are generally not used to being removed from the class and tested individually. This factor led to many of these students being nervous about completing the tasks. Many indicated that they were "nervous" during the testing when questioned by the examiner, even though efforts were made to put students at ease. Also, the fact that the good readers have a more competent grasp on reading and knowledge of letters and spelling had an effect on their performance in segmentation tasks. Some of the good readers were distracted by their orthographical knowledge and therefore had difficulty focusing on the sounds only. This task of isolating sounds is often an unfamiliar one for students of this reading capability. This difficulty did not apply to the poor readers in the sample whose orthographical knowledge is not as developed.

Another factor that needs to be considered is the design and accuracy of the tests themselves. The validity of the Neale Analysis test can be relied upon in this study as the results confirmed previous reading analysis tests conducted. There are, however, a number of tests used to assess phonological knowledge and items used to measure elements of phonological awareness can vary greatly on the same type of task. Yopp in Stahl and Murray (Stahl & Murray, p.222) points out that "there are problems with the tasks commonly used to assess the construct. Items vary greatly both between and within measures on the same type of task. For example, some blending tasks use nonsense words, some real words; some have more short consonant-vowel-consonant (CVC) words, others contain more words with consonant blends." This variability will inevitably affect test results. In order to investigate more accurately how good and poor readers perform in certain dimensions of phonological awareness, the linguistic complexity as well as the memory component of individual items within each task would need to be considered as in the studies collated by Stahl and Murray. Smith, Simmons and Kameenui (1995) noted that the following tasks have been used in recent research as indicators of phonological awareness: auditory discrimination, blending, counting, deletion, isolation, rhyme, segmenting, substitution, sound categorization, tapping, reversing order of sounds, and word to word matching". Not all of these items are tasks on the Sutherland Phonological Awareness test. Further testing could be conducted using other tests, and the results compared, in order to gain a more accurate measure of the abilities of the students involved.

Student performance on word tests was not included in this study. Conducting such tests on isolated words would also give a further insight into the phonological knowledge the students bring to word recognition tasks, as would performance on spelling tasks. Some phonological awareness tests also include spelling tasks.

The relations between phonological awareness and reading acquisition are complex, and there is strong evidence that difficulty with awareness and manipulation of verbal sounds has powerful effects on reading ability. However, the most positive finding stemming from research on phonological awareness is that "critical levels of phonological awareness can be developed through carefully planned instruction" (Chard & Dickson 1999) There is also consistent support

that “phonological awareness facilitates reading and is facilitated by reading instruction.” (Smith, Simmons & Kameenui 1995) This finding has important implications for teaching. It implies that students must be taught explicitly about sounds in order to benefit from reading instruction but also that phonological awareness can be heightened in relation to reading of text. Teaching programs, therefore, need to include activities which focus on the sounds in spoken English in pre-school and in the early years of schooling. Such activities include rhyming activities, breaking speech into individual words, alliteration, blending sounds, segmenting of words into onset & rime and then to more demanding tasks such segmenting or deletion of individual phonemes. As students learn to read and are beginning to spell words, focus also needs to be given to phonological awareness in relation to words encountered to develop more sophisticated phonological ability.

This investigation provided an examination several dimensions of phonological awareness and their relation to reading as a general ability. Future research is needed in order to examine these dimensions in more depth, to investigate the relationship between dimensions and relations between dimensions and different aspects of reading.

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