DIFFICULTY LEVELS IN THE MEASURES OF PHONOLOGICAL AWARENESS DISPLAYED IN THE PERFORMANCE OF CLASS SIX PUPILS WITH READING DISABILITIES IN SELECTED SCHOOLS IN NAIROBI COUNTY.

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ABSTRACT

The present study set out to establish the difficulty levels of the tasks used in measuring phonological awareness skills. In particular, it sought to determine the difficulty of the tasks using class six learners identified to be exhibiting reading difficulties from selected school in Nairobi County- Kenya. A sample of 25 pupils was engaged in the study after administering a reading disabilities diagnostic test. The tests were categorised as: Non-word Reading, Phoneme Blending, Phoneme manipulation, Phoneme Segmentation and Phoneme Production. The data were obtained from tape - recorded texts and marking of the scores of the respondents in the tests. The scores in the test displayed the levels of difficulties in the tasks. The results showed that phonological production was the least difficult with the most difficult being phoneme segmentation of the entire phonological awareness task.

1.0 Introduction

Phonological awareness has been defined as the ability to pay attention to and also differentiate between sound units and structure of a language and that these patterns are

separate from meaning (Gillon, 2004; McBride- Chang, 2004). A child learns to identify, segment and manipulate a string of speech into sentences, words, syllable and then sounds (Ranweiler, 2004). The acquisition of this skill is demonstrated through tasks such as rhyming, identification of initial sounds and final sounds in a word, blending sounds to form words and segmenting words and syllable (NRP, 2000; Gillon, 2004). The present study tests the respondents' skills of blending, manipulation and segmenting of various words. The aim is to establish their abilities in phonological awareness particularly at the phonemic level. A child may perform better in one phonological awareness task and poorly in another phonological awareness task.

Such inconsistencies in performance have made some researchers to pay more attention to the linguistic complexity of phonological awareness tasks. These features include: word length, number of consonant clusters, tasks requirements, such as blending, segmenting and the size of the unit being manipulated, such as the sentence, word or syllable (Runge & Watkins, 2006). Researchers believe in the significance of the linguistic complexities in phonological awareness tasks also suggest that such tasks may be better predictors of future reading success (Adams, 1990). The present study uses different sub-tests of phonological awareness with different linguistic complexities to help it generate data to demonstrate the difficulty level of phonological awareness tasks

2.0 Methodology

2.1 Study Area

The study was conducted in primary schools in Nairobi County. Nairobi County is the capital city of Kenya. It has eight administrative divisions. Being the capital city, it is cosmopolitan in nature and thus it is representative of the complex language situations of the country.

2.2 The Target Population and Sample Size

The 25 respondents, sixteen boys and nine girls ranging in age from twelve years old to fifteen years old, were selected from class six from selected primary schools in Nairobi County. The 25 respondents were selected from a group of 65 pupils who had been recommended by the various class teachers from the sixteen schools that had been visited has exhibiting various reading disorders.

To select respondents who fitted into this study, the researcher went to two schools in each of the eight divisions in Nairobi County. The class teachers in the selected schools assisted the researcher in identification of pupils with reading disorders. The class teachers based their selection of these pupils on their performance in the end term examinations. Because this was not the best way to establish if a pupil had reading disorders, the researcher went ahead to administer a reading assessment test to the pupils. This test was administered to satisfy the respondents' inclusion criteria. The reading assessment test had 72 items, the first 8 being sounds of English and the remaining 64 being words. The students who scored below 30 were considered to have reading problems thus they were selected as respondents in this study. Out of the 65 pupils identified as having reading problems, 25 scored below 30 and were thus included as respondents in this study.

2.3 Research Instrument

Five subtests testing on phonological awareness were used in data collection. The data obtained were tape recorded and later transcribed. The tests included: Non-word Reading Test, Phonological Production Test, Phonological Manipulation, Phonological Segmentation and Phoneme Blending Test.

A) Non-word Reading Test

The Non-word reading test consisted of fifteen meaningless but phonologically legal three to four strings (pseudo words). The word patterns used in these pseudo words are existing morphophonemic patterns and reflect all possible combinations of letters and vowels. The respondents were asked to read the non-words aloud. During this exercise, the respondent was tape recorded. The researcher also had a copy of the test which was marked for correct readings and incorrect readings. The data was used in analysing the respondents' pronunciation of the vowel sounds and the consonant sounds in the fifteen items in the test items.

B) Phonological Production Test

In this test, the respondents were instructed to come up with five words starting with the phoneme that was specified by the researcher. Eleven phonemes were arbitrarily selected to help generate fifty five words. This does not mean that the eleven phonemes are more special than other phonemes of English. This test was to test the respondent's ability to generate lexical items that began with the sounds given. The phonemes used in this task were: /d/ /b/, /k/, /m/, /g/, /s/, /æ/, /ɔ/, /e/, /ʊ/ and /ɪ/. A target of 55 words was expected from each respondent.

C) Phonological Manipulation

Phoneme manipulation is the ability to add, delete, substitute, or rearrange phonemes or groups of phonemes within a word. Three tasks were used to measure this level of phonological awareness skill in this study.

i) Initial Consonant Identification

Respondents were presented with ten words. In the first part of this test, they were to listen to one word at a time then tell the researcher aloud what the first sound of the word was. For example, the first sound of the word 'frog' is /f/. In the second part, they were presented with a word and its truncated part. They were to identify the missing sound at the beginning of the truncated part. These were to test their ability to identify sounds from words.

ii) Final Consonant Deletion

This test is similar to the initial consonant identification task described above, except that the respondents were supposed to identify the final consonant. Five words and their truncated parts were used in the task.

D) Phonological Segmentation

Phonological segmentation is the ability to decompose a word into phonemes and syllables. The respondents were presented with words one at a time and were asked to tell the researcher the sounds that made up the words and to give the number of sounds in each word. Five words were used in this test with the target response expected by the researcher being 17. This is the total number of the phonemes in all the five words.

E) Phoneme Blending

Phoneme blending is the ability to combine phonemes into syllables and syllables into words. A phoneme blending task in which the respondents are to hear a sequence of isolated sounds with a short pause between them, for example, /kæt/ was used to measure the phoneme blending ability of the respondents. The respondents were to say aloud a word that is made up of the sequence of the sounds they heard from the researcher. In order to be counted as correct, the pronunciation was to be correct. For example /bæk/ required the response *'back'*.

Eight items were used as presented in this subtest. According to the researcher's knowledge, there were no items that would present challenges to the respondents either because they were unfamiliar or complex. The focus in this study was on the vowel sounds and the consonant sounds found in the words in this particular test, thus 26 items were to be focused on.

2.4 Reliability of the Instrument

The reliability of the tests in which the test items has the ability to be repeated needed to be considered. Reliability according to Ary, et al., (2006), refers to "the degree of consistency with which a measuring instrument measures whatever it is meant to measure." (p.254). When the instrument was being pilot tested, it was necessary to focus on the inclusion of several items pertaining to a particular phonological awareness measure. Each subtest in the instrument was asked in a different way in order to obtain a similarity in responses. A consistency of responses was required to obtain higher degree of reliability. Internal consistency was considered in the subtests as the instructions in the tests would require a response similar or in direct opposition from the respondents on the test. Split-half method was used to group the scores into even number scores and odd number scores. These scores were computed in SPSS to obtain Cronbach's coefficient. The instrument had Cronbach coefficient alpha of 0.75. Ary, et al., (2006) indicate that a coefficient above 0.70 is considered sufficient for most researches.

2.5 Validity of the Instrument

Validity is a significant factor for consideration when designing and implementing a test instrument. Ary, et al., (2006) define validity as "the extent to which scores on a test enables one to make meaningful and appropriate interpretations" (p.242). Content validity was established as the instrument was being developed. Each of the items on the instrument was extracted from the information obtained from the literature review which related directly to

the questions that were contemplated for this study. Researchers have listed the subtests of phonological awareness to be the appropriate measures of testing phonological awareness. For example, a connection to these instrument items can be made to an article by Kirby, et al., (2003) who wrote that, "there is considerable evidence that phonological awareness is a key component in the development of reading ability and that poor PA is a, or perhaps the core deficit in reading disability."

The phonological awareness subtests are also used by Levis, et al., (2007) to measure phonological awareness. The wordings of the questions and the phonological awareness measures were given careful consideration by the researcher in developing the test instrument. The instrument developed had the potential to adequately represent the phonological awareness measures that were the focus for the study outcome. A pilot study was done to ensure that the questions and the skills being tested were clear and coherent. Construct validity was established using factor analysis. The scores of the respondents were used to compute the analysis in SPSS to get the validity index of the instrument as 0.89, this value is within the recommended range of 0.70 that Ary, et al., (2006) gives as the required minimum validity of research test.

2.6 Data Collection Procedure

The class teacher organised a room where the collection of data was to be conducted. The tasks were explained clearly to the respondents to make sure that they understood what was required of them. The researcher then showed the respondents the tape recorder and told them to talk into it and be tape recorded. The recording was then played back to them so that they would become familiar with tape recording process and thus reduce the effect of the observer paradox.

Each respondent was tested individually in a relatively quiet room at their school. There were 20 minutes testing sessions for each learner per day. During these sessions, the readings done aloud by the respondents were tape recorded. The researcher used the hard copy of the test in marking the tests, putting a tick (√) where the word or sound was correctly articulated or a mark for incorrect (×) where the articulations were not the target.

2.7 Data Analysis and Presentation

2.7.1 Transcription of Data from Tests

The transcription focused on the phonological awareness measures: non-word reading, phonological production, phonological manipulation, phoneme blending and phonological segmentation. Data from these categories were summarized and analysed to determine the respondents' phonological awareness difficulties. The respondents' pronunciations that were different from the target expectations from each phonological awareness tasks were analysed as deficits in phonological awareness.

All the tests in this study required marking. As the respondents were reading the test items loudly as per the instructions, the researcher was marking the items that they got correctly and those that were incorrect. The present study used the mean, mode, range, frequencies, and percentages to establish the difficulty levels of phonological awareness tasks.

2.8 Informed Consent

The rights of the respondents are protected through debriefing and informed consent. The National Special Needs Education Policy (2009) states that Education, Assessment and Resource Centres (EARCs) is mandated to identify, assess, provide intervention and placement of learners with special needs and disabilities. Parents and the community are also primary in the process of identification. The present study requested teachers to help in the

identification of the respondents for the present study. To engage the identified pupils in the study, consent was sought from their parents. The purpose of conducting the research was explained to the parents and the teachers. Each parent was informed that his/ her child's participation in the research was voluntary and that he/she was free to withdraw his/ her child without fear of being penalised by the researcher or the school. Each parent confirmed that his/her child did not have hearing or sight problems.

3.0 FINDINGS AND DISCUSSIONS

3.1 Difficulty Levels of the Measures of Phonological Awareness

In this section, the focus is on the results of the performance of the respondents in the phonological awareness tests with an aim of establishing the difficulty levels of the measures of phonological awareness. This section is organized as follows. Section 3.1.1 gives the descriptive statistics for the overall tests scores. Section 3.2 presents the test difficulty for all the PA tests. Section 3.3 discusses the results of the individual tests. Finally, section 3.4 will give the conclusion of the section.

3.1.1 Descriptive Statistics of the Performance of the Respondents

Twenty-five respondents in the sample were instructed to answer all the questions from five phonological awareness sub-tests. These five sub-tests were used to elicit 2450 responses which were then categorised as per the measure of phonological awareness that was being tested. The first sub-test was the Non-word reading test. It contained meaningless but phonologically legal pseudo words. It was testing the respondents' skills of reading unfamiliar words. The Non-word Reading test elicited 375 responses. The second test was the Phonological Production test. In this test, the respondents were to generate five words which began with each of the phonemes given in the test. It elicited 1375 responses. The third test

was Phoneme Blending; it was testing the respondents' ability to put together individual sounds to come up with English words. It elicited 200 responses.

The fourth test was Phonological Manipulation. This test required the respondents to be able to identify the initial sound (onset identification), last sounds (coda identification) and the missing sound from the items used in the test. It elicited 375 responses. The fifth test was Phoneme Segmentation in which the respondents were expected to identify the individual phonemes that made up the words given as the test items. It elicited 125 responses. Table 3.1 gives the overall grouped scores, frequencies and the percentages of the performances of the respondents out of the possible 98 marks.

Table 3.1: Grouped Scores of the Performance of the Respondents in the PA Tests

Grouped Scores	Frequency	Percentage (%)
10 – 19	1	4
20 – 29	1	4
30 – 39	0	0
40 – 49	7	28
50 – 59	9	36
60 – 69	5	20
70 – 79	2	8
TOTAL	25	100

From Table 3.1 above, it is evident that 64% of the respondents performed above the mean which was 52.3. The respondents who performed below the mean were 36%. The respondent who performed poorly had a score of 14 and this was followed by another respondent who scored 25 marks out of the possible 98 marks. 8% of the respondents had high scores in the range of 70 to 79 marks with the highest scorer getting 77 marks out of 98. Overall, it was thus observed that even though the respondents were class six learners with some reading disabilities, 64% were still able to score well in the phonological awareness task as is evident in Table 3.1 above. The present study goes further to present and discusses the performance

of the respondents in the individual tests that were used in the study. Table 3.2 summarizes the respondents' overall performances in each test.

Table 3.2: Respondents' Overall Performances in Each Test. (N=25)

PA TASK	N	MINIMUM	MAXIMUM	MEAN
Non-word	25	0	14	7
PM	25	0	12	4.6
PB	25	2	8	5.52
PS	25	0	2.5	0.9
PP	25	16	47	32.64

Table 3.2 shows the maximum score, the minimum score and the mean the various sub-tests used in the present study. The first test was Non-word reading in which the respondents were to pronounce the unfamiliar words. The maximum and minimum possible score on non-word reading ranged from 0 to 15. Analysis of the results showed that the minimum score was 0 and the maximum score was 14. The second test was Phonological Manipulation in which the respondents were to identify initial sounds, missing sounds or the last sounds from the test items. The maximum score a pupil could obtain in the Phonological Manipulation subtest was 15 and a minimum score of zero (0). Data analysis revealed results which ranged from a minimum score of zero (0) and a maximum score of 12. The mean score was 4.6.

The third test was Phoneme Blending which required the respondents to combine individual sounds to come up with words. For this test, the expected maximum and minimum scores were 8 and zero (0), respectively. Data analysis scores ranged from a minimum score of 2 and a maximum of 8. The mean score was 5.52. The fourth test was Phoneme Segmentation which required the respondents to identify the individual phonemes that made up the words used as the test items. The maximum score the pupils could obtain in Phoneme Segmentation

subtest was 5 and a minimum score of 0. Data analysis scores ranged from minimum score of zero (0) and a maximum score of 2.5. The fifth test was Phonological Production which required the respondents to generate five words for each sound given in the test. The maximum expected score in Phonological Production subtest was 55 and the minimum score zero (0). After the analysis of the data in this subtest, the maximum score was 47 and the minimum score of 16. The mean score was 32.6. The next section presents the difficulty levels of the sub-tests used in the present study.

3.2 Difficulty Levels of the Sub-tests

The difficulty level of the sub-tests used in the present study was ranked according to the mean score obtained in each test. Because the numbers of items in each sub-test was different, a comparison between the sub-tests could be made only by using converted means (Yopp, 2000). Therefore, the results of the phonological awareness measures are compared by using converted means by averaging the correct rates for all respondents in each test. Table 3.3 shows the difficulty levels of the sub-tests used in the present study. These converted means are used to rank the tests from least to most difficult.

Table 3.3: Test Difficulty of PA Tests

Level of Difficulty	PA Tests	Mean
The least Difficult	**PP**	**32.64**
↓	**NW**	**7**
	PB	**5.52**
	PM	**4.6**
Most Difficult	**PS**	**0.9**

Table 3.3 shows that the least difficult sub-test was Phonological Production test with a mean of 32.64. This is followed by Non-word reading with a mean of 7. Then the Phonological Blending with a mean of 5.52, Phonological Manipulation with a mean of 4.6 and the most difficult task was Phonological Segmentation with a mean of 0.9.

Based on Dechant's theory (1993), we would expect to see the rank of relative difficulty of these phonological awareness tests in the current study from the least difficult to the most difficult to be, phoneme blending, phoneme segmentation, phoneme manipulation, and pseudo-word reading. The ranking in the present study shows that there is no clear cut rule that shows the difficulty level of phonological awareness. A study that supports the phoneme segmentation is one of the most difficult PA sub-test is that done by Chen, (2009) who found that Phonemic segmenting was the most difficult task for Taiwanese children in English phonological awareness tasks. The next section gives a presentation and discussion of the results of each sub-test used in the present study.

3.3 Results of the Various PA Sub-tests used in the Present Study

The results on Non-word, Phonological Manipulation, Phonological Production and Phoneme Blending subtests are presented and discussed.

3. 3.1The Non-word Test

Non-words are not English words but are constructed based on English language phonotactics. This task was used to determine if the learners were using their phonological awareness knowledge in reading the non-words as they were presented to them with no attempt to read them like English words.

However, there were mis-articulations in their reading of the non-words that were observed after data transcription and analysis. The mis-articulations made in this task were classified into the following categories: 'substitution', 'phoneme deletion', 'phoneme insertion', and 'atypical' representing the nature of phonological problems exhibited in the readings of the respondents.

Table 3. 4: Descriptive Data on the Responses from Non-word Reading Test

Responses	Frequency	Percentage (%)
Correct reading	179	47.7
Substitution	106	28.2
Atypical	61	16.3
Phoneme Deletion	10	2.7
Letter Naming	3	0.8
Phoneme Insertion	1	0.3
No response	15	4
Total	**375**	**100%**

Table 3. 4 shows that 47.7% of the learners blended the sounds accurately in the articulation of the non-word as was targeted. However, when the percentages of the mis-articulations of substitution; phoneme deletion; phoneme insertion; letter naming and atypical were added, they made a total of 48.3% of the responses. 4% did not respond to the reading task. Substitution mis-articulations constitute the modal class at 28.2% in the Table 3.4 above. The least common mis-articulation was phoneme insertion at 0.3%. Atypical mis-articulations which are considered to be the most serious manifestations of lack of phonological awareness made up 16.3% percent of the responses. Literature shows that the ability to decode non-words is a predictor of good reading (Pullen et al., 2005 & Bryne & Fielding-Barnsley 1993).

A study by Olson et al., (1992) supports the findings of the present study. They asked respondents to read pronounceable non-words from a sound symbol test. These included

(bim, rayed, neap, tuaf, cedge). They also read 36 regular and 36 exception words. The 43 reading disabled and the 67 normal readers were drawn from a population of 7 to 12 years old and were divided into reading level bands, so that the reading disabled were 2-5 years older than the normal readers. Olson et al., report that at all the grade/class levels, children with reading disability performed worse than the level matched normal readers on the measures of non-word reading.

The findings of this present study agree to some extent with Olson's (1992) that the non-word reading test could enable a researcher to establish the phonological awareness deficits of learners with reading disorders. It has been observed in Table 3.4 that 52.3% of the respondents had difficulties in reading the non-words. This is a clear manifestation that these respondents lack appropriate phonological awareness skills. However, the results also show that 47.7% of the respondents read the non-words correctly. This shows that the non-reading task was not very difficult for the respondents within the 47% of the total number of the respondents.

It was also noted that individual non-words also presented different challenges to the readers. The exception was the respondent 13 who had problems in reading all the words. It was observed that a respondent could have a problem reading one non-word and have no problem in reading the others. This shows that a large number of the respondents did not exhibit a clear consistency in their reading of non-words. There were yet some respondents who failed to read. These were labelled in the tables as 'no response'. The assumption was that they had problems reading the words.

3.3.2. Phonological Manipulation Test

Phonological manipulation is a phonological awareness measure which requires the respondents to identify the phonemes that compose words. In this test, the respondents were

required to perform three tasks. First, to identify the initial (onset) sounds in the English words presented to them. Second, to identify the last sounds (coda) in the English words presented to them. Third, they were to identify the missing sound in the English words used in this task.

i. First Sound Identification

Table 3.5 gives the frequencies and the percentages of the respondents who identified the target sounds correctly and the frequencies and percentages of those who had difficulties in identifying the target sounds.

Table 3.5: Identification of first sounds in Phonological Manipulation (N = 25)

First Sound	Incorrect Identification	
	Frequency	Percentage (%)
/k/	17	68
/b/	13	52
/f/	13	52
/d/	11	44
/g/	10	40

The percentage of the respondents who identified the first sound correctly varied from one phoneme to another. 68% did not identify the voiceless velar stop /k/ correctly. 52% of the respondents did not identify the voiced bilabial stop /b/ and the voiceless labio-dental /f/ respectively. Incorrect identification of the voiced alveolar stop /d/ was at 44% and that of voiced velar stop /g/ was at 40%.

From the transcriptions of the responses of the respondents, it was observed that the respondents used their letter knowledge to identify the first sound in the word “computer” which was the test item instead of identifying the corresponding phoneme that is realized at

the initial position of the word. Respondents identified the first sound in the word "computer" as < c > which should be realized as /k/ in articulation.

From the analysis of the transcribed data, the identifications of the sounds /b/, /f/, /d/ and /g/ were considered incorrect in instances where the respondents did not display their awareness of onsets and rimes. The English syllable has an onset which is the first consonant or consonant clusters that appear at the initial position of that syllable. The other part of the syllable is called the rime; made up of a nucleus and a coda. For example, the word "tap" is a monosyllabic word which can be divided into /t/ which is the onset and /ap/ which is the rime. The vowel sound in a syllable is thus part of a rhyme and not the onset.

When respondents were asked to identify the initial sounds of a word, they were expected to identify the onsets in the CVC structure. It was found out in the present study that 6.4% of the responses were instances where the initial sound was combined with the vowel sound that came after it. Examples of such response were: /bɔ/ instead of /b/, /fa/ instead of /f/, /da/ instead of /d/ and /gɔ/ instead of /g/. This mis-articulation is referred to as "phoneme insertion". Yopp (2000) says that the students have to develop awareness that speech sounds are objects that can be manipulated. Ability to identify individual sounds in words facilitates a reader's decoding and encoding skills (Manyak, 2008). Student's ability to identify initial, medial or final sounds and categorize them improves their ability to manipulate sounds (Grifith & Olson, 1992).

ii. Last Sound Identification

Table 3.6 gives a summary of percentages of the respondents' performance in identifications of the last sounds in the phoneme manipulation test.

Table 3.6: Identification of Last Sounds in Phonological Manipulation Test (N = 25)

Last Sound	Incorrect Identification	
	Frequency	Percentage (%)
/aʊa/	25	100
/n/	22	88
/p/	19	76
/s/	17	68
/t/	16	64

In this sub-test, the respondents were to identify the last sound of the test items. The last sounds could be vowel sounds in instances where the word did not have a coda. None of the respondents could identify that the last sound in the word "power" was the triphthong /aʊə/. This could mean that the respondents were relying on the letters that made up the word going by the responses they gave instead of identifying the sounds. Some of their responses were: < ower >, <wa>, < w > and < r >. English has a complex vowel system. It has short vowels, long vowels, diphthongs and triphthongs (Roach, 2009). It is evident that the respondents were not aware of the existence of such complex vowel structures thus their responses. 88% could not identify the voiced alveolar nasal /n/, 76% could not identify the voiceless bilabial stop /p/, 68% could not correctly identify the voiceless alveolar fricative /s/ and 64% could not correctly identify the voiceless alveolar stop /t/.

iii. Missing sound Identification

Table 3.7 below gives a summary of the frequencies and percentages of responses on the identification of missing sounds from the words given in the phoneme manipulation test.

Table 3.7: Identification of Missing Sounds in Phonological Manipulation (N = 25)

Missing Sound	Incorrect Identification	
	Frequency	Percentage (%)
/p/	23	92
/s/	23	92
/m/	22	88
/t/	21	84
/ʤ/	15	60

The task on missing sound identification required the respondents to identify the sounds that should have appeared at the onset of the test items. The difference between this test and the one in the first sound identification is that two test items were presented unlike the first one that only contained one test item.

92% of the respondents could not identify the missing sound /p/ found in the word 'play' and another 92% could not identify the missing sound /s/ found in the word 'stop'. This was followed by 88% who could not identify the sound /m/ then 84% who could not correctly identify the sound /t/ and lastly 60% who could not identify the sound /ʤ/.

Table 3.8: Summary of the Responses from Phonological Manipulation Test

Responses	Frequency	Percentage (%)
Correct Identification	107	28.5
Letter Naming	161	42.9
Atypical	62	16.5
Phoneme Insertion	24	6.4
Phoneme Deletion	13	3.5
Substitution	6	1.6
No response	2	0.5
Total	**375**	**100%**

Table 3.8 above shows the percentages of the different categories of responses given in the phonological manipulation test. It can be observed from the Table 3.8 above that 28.5% of the respondents articulated the target phonemes correctly. A statistically insignificant figure of 0.5% did not give any response to some of the sounds. From Table 3.8 70.9% of the responses were incorrect articulations with letter naming taking the bigger percentage of 42.9% followed by atypical mis-articulations at 16.5%, phoneme insertion mis-articulations at 6.4%, substitution mis-articulations at 1.6% and phoneme deletion mis-articulations at 2.7%. It can be observed that phonological manipulation test was difficult for the respondents. However, it may be pointed out further that these respondents lacked knowledge in letter- sound correspondence. They were expected to identify the sounds that corresponded to the letters that were used in the orthography of the words given.

The results in (Tables 3.5, 3.6 and 3.7 in this section) show that the learners had problems in the identification of the first sound, the last sound and the missing sound in the words that were read aloud to them. Of the three parts of the test, learners performed dismally in identification of the last sound. This performance is replicated also in the identification of the missing sound. In the first sound identification, the result was much better. It can be noted therefore that, of the three tasks, first sound identification was easier for majority of these respondents than the other tasks in this test.

Studies reveal that children identify the initial phoneme with fewer errors than the final phoneme (Treiman, et al., 1998). Treiman, et al., (1998) proposed an explanation for this phenomenon in terms of the onset- rime structure of the syllable. They argue that it is more difficult to access the final phoneme because it forms a phonological rime unit together with the preceding vowel. The initial phoneme, on the other hand, may be easier to access because it acts as a phonological unit on its own, that is, the onset.

de Graaff et al., (2007) working with kindergarten children also established that performance in identification of phonemes in word initial position was better than performance in identification of the phoneme in the final position of a word. It has been stated here that phonemes in the initial position are more often correctly identified than phonemes in the final position irrespective of the phoneme class to which the phoneme belonged. In this study, the phonemes in the initial sound identification task were: stops /k/, /b/, /g/ and /d/ and the fricative /f/ while the phonemes in the last sound identification sub-task were: stops /p/ and /t/, fricative /s/, nasal /n/ and the vowel /aʊə/.

From the present study, it is evident that the classification of a sound according to its place or manner of articulation did not reveal much as far as identification of the initial sound or final sound was concerned. The identification of plosives and fricatives in the initial position of a word or the identification of plosives or fricatives in the final position of the words did not reveal any significant difference in the performance of the respondents in these sub-tasks. This finding is supported by the results of Treiman et al., (1998) study who found that there were no difference between fricatives and plosives when they asked kindergarteners to perform phoneme recognition tasks in words.

However, mixed findings have been revealed in a series of studies in which the effects of plosives and fricatives were examined. Yavas & Gogate (1999) and Yavas & Core (2001) found out that performance on final consonants recognition was better for plosives than for fricatives. In other studies however, exactly the opposite result was obtained. For example, Bryne &Fielding – Barnsley (1990) found relatively poor performance by children in a phonemic identification tasks for plosives compared to fricatives in both initial and final position. Mc Bride – Chang (1995) also found that performance on position analysis was better for items containing fricatives than for items containing plosives.

It was also observed that the nasal sounds /m/ at the initial word position and the nasal sound /n/ at the word final position were incorrectly identified at 88% respectively. This finding is in contrast with Bryne & Fielding –Barnsley (1990) who reported better performance on both an initial and final phoneme identity task for nasals than for plosives. It is evident that the respondents had lesser difficulties in identifying the plosives than the nasals in the present study.

de Graaff et al,. (2007) argue that task properties can influence performance in a phonological awareness task. The number of operations may require the respondent to perform only one mental operation for example, initial or final sound identification. This they called simple phonemic awareness task. Tasks that require more than one mental operation are referred to as compound phonemic awareness tasks. Compound phonemic awareness tasks appear to be more difficult to children than simple phonemic awareness tasks. The test on missing sound identification contained two test items which required the respondents to analyse before identifying the missing sound from the second construct. This could be the reason why the respondents performed poorly in this sub-task. This is supported by de Graaff et al (2007) finding that task instructions affect children's performance in phonological awareness tasks. That is, the children performed better on CVC sound identification tasks when the instruction was free rather than when it was constrained.

3.3.3 The Blending Test

Phonological Blending is the process of combining sounds to come up with words. The respondents were expected to blend the sounds given to form correct English words. The outcome is shown in Table 3.9. The responses from this sub-test were categorised as: Correct blending which is the percentage that contains correct blending. Those labelled 'substitution', 'phoneme insertion', 'phoneme deletion', and 'atypical' represent the nature of mis-

articulation manifested in analysed data from the responses of sounds by the respondents in the blending sub-test. 'No response' caters for those who did not blend some of the sounds to form words.

Table 3.9: Different Responses from Phoneme Blending Test

Responses	Frequency	Percentage (%)
Correct Blending	139	69.5
Atypical	26	13
Substitution	18	9
Phoneme Insertion	12	6
Phoneme Deletion	1	0.5
No response	4	2
Total	**200**	**100%**

It is evident in Table 3.9 that the respondents performed well in the blending task. 69.5% blended the sounds correctly to come up with correct English words. The result on correct blending shows that even though the respondents were reading disabled, they were able to perform well in the blending test. According to the ranking of the difficulty of phonological awareness in Table 3.9, blending of phonemes is less difficult than a phonological awareness task that requires segmentation of phonemes that make up a word. 28.5% of the respondents made various blending mistakes and 2% gave no response.

A study that confirms that blending tasks could be easier than segmentation tasks is one that was conducted by Seymour and Evans (1994) who found out that blending was easier than segmentation for children who were required to blend and segment monosyllabic words.

The findings that knowledge in one phonemic awareness does not necessarily mean that a learner will also be knowledgeable in another is supported by the finding of some researchers. Jenkins et al., (1994) sought to clarify how one learning one kind of phonemic skill (e.g. auditory blending of individual sounds) affects children's ability to perform another

kind of phonemic skill (e.g. segmenting spoken words into their phonemic constituents). (Jenkins, et al., 1994) report that the results on the phonemic generalization tests indicated that children taught segmenting-only, blending-only, or segmenting and blending performed substantially better on the particular skill (s) that they were taught than did an uninstructed control group.

From the findings by Jenkins, et al (1994), it may be pointed out that, if blending and segmenting share common components (e.g. an awareness that words are composed of phonemes) then it is expected that generalisation from one skill to another is observed. In the present study, it was noted that good performance by respondents in the blending task was not replicated in the phoneme segmentation task.

3.3.4 Phonological Production Test

Many respondents performed well in the phonological production test. In this test, the respondents were to give five English words that began with the sounds that were presented to them by the researcher. Fewer problems with the production of words were realised with the consonant sounds. However, there were numerous substitution mistakes in the production of sounds that began with the vowel sounds. Table 3.10 below gives a summary of the mean scores of the respondents in the phonological production test dealing with the consonant sounds while Table 3.11 gives a summary of their mean score in production of words that began with the vowel sounds.

Table 3.10: Performance in Production of Words Beginning in Consonant Sounds

Scores	6	16	17	18	19	20	21	22	23	25	26	27	28	29	**Total**
Freq	1	3	1	2	1	2	1	3	1	3	1	2	1	3	**25**
X	6	48	17	36	19	40	21	66	23	75	26	54	28	87	**545/25= 21.8**

Table 3.11: Performance in Production of Words Beginning in Vowel Sounds

Scores	5	7	9	10	11	12	13	14	15	16	17	**Total**
Freq	1	1	1	1	5	1	4	6	2	2	1	**25**
X	5	7	9	10	55	12	52	84	30	32	17	**313/ 25 = 12.52**

It is evident in Table 3.10 and 3.11, above, that the respondents performed well in producing words that began with consonant sounds with a mean score of 21.8 against the mean score they obtained in production of words that started with the vowel sounds given in the Phonological Production test. Performance in production of words that began with consonant sounds was better with three students scoring 29 points out of the possible 30 marks. The respondent who scored highest in production of words that began with vowel sounds got 17 marks out of the possible 25. The distribution of marks in Table 3.10 and 3.11 reveal that the respondents generally performed better in tasks involving the consonant sounds compared to those involving the vowel sounds. This could be attributed to the fact that consonant sounds in English are easier to master than the vowel sounds of English which are more complex as a child has to be aware of the short vowels, the long vowels the diphthongs and the triphthongs.

3.3.5 Phoneme Segmentation Test

The respondents were expected to segment the words given in the phoneme segmentation test in order to come up with individual sounds that were used to make up the word. The phoneme segmentation test contained only five test items which each respondent was to keenly listen to as the researcher read each out and then identify the phonemes that made up the word. Their responses were captured as shown in the Table 3.12. 'Correct segmentation' contains the percentage of the responses where individual sounds were identified correctly. Those labelled, 'phoneme insertion', 'phoneme deletion', 'spelling the word', 'pronouncing

whole word', 'splitting the word' and 'atypical' represent the nature of phonological problems exhibited while attempting to segment the target words by the respondents. 'No response' represents those who did not segment some of the words to get individual sounds.

Table 3.12: Responses from Phoneme Segmentation Test

Responses	Frequency	Percentage (%)
Correct Segmentation	10	8
Pronouncing whole word	35	28
Splitting the syllable	35	28
Atypical	22	17.6
Spelling the word	15	12
Phoneme Deletion	3	2.4
No response	5	4
TOTAL	**125**	**100**

From the Table 3.12 above, it can be observed that phoneme segmentation was a very difficult exercise for the respondents. Only 8% gave correct responses. 28% did not give the individual sounds that made up the words, they pronounced the entire word. 28% displayed some phonological awareness by trying to split the one syllable words into two. 12% of the respondents opted to spell the words instead on identifying the phonemes in them. Moreover, 17.6% of the respondents gave responses that exhibited that they did not comprehend at all what was required of them to perform in the task; these were referred to as atypical responses.

For example, giving the word "smell" instead of identifying the sounds in the word "nose", producing the word "hot" instead of identifying the sounds in the word "hand". The conclusion here was, respondents found the segmentation test to be the most difficult task. Their lack of phonological awareness in identifying phonemes that make up words was observed to be very high.

An attempt to explain these findings can be supported by the findings of Pufpaff (2009). Pufpaff (2009) reports the relative difficulty of syllable segmentation compared to phoneme segmentation among children in pre-school, kindergarten and first grade. Pufpaff (2009) report that syllable segmentation was easier than phoneme segmentation. None of the children in pre-school could segment by phoneme while nearly half, 46 percent, could segment by syllable. Among the kindergarteners, only 17 percent could segment by phoneme, whereas 48 percent could segment by syllable. Accurate performance increased dramatically in first grade, with 70 percent successfully segmenting by phoneme and 90 percent by syllable. This was one of the studies that empirically demonstrate that syllable level segmentation is easier than phoneme level segmentation and suggested that beginning reading instruction is likely to contribute to the development of phonemic awareness.

Owing to the fact that these are readers with reading disorders, it can be pointed out that despite the levels of instruction they have gone through, they are yet to develop phoneme segmentation skills. Pufpaff (2009) study included kindergarteners and first graders. It is seen that with a certain level of instruction, children improve in their phonological awareness skills. The respondents in this study are in class six with their ages ranging between 12 years to 15 year olds. It is, therefore, assumed that they should not be exhibiting any problems in this task. It can be assumed that they lack the awareness that words can be segmented further into the smaller constituents that make them up called phonemes.

3.4 Conclusion

The present study discussed results to show the difficulty levels in the measures used in testing the phonological awareness skills of learners in class six with reading disabilities. The results show that phonological production was the least difficult. This was followed by non-

word reading and phoneme blending tests. The most difficult sub-tests were phonological manipulation and phoneme segmentation with phoneme segmentation being at the extreme end in the level of difficulty. Teaching of reading should therefore take a multi-faceted approach that includes training of children in all the aspects of phonological awareness based on blending, manipulation and segmentation of phonemes. Non-word reading should also be used to test on how readers attack new words that they have not encountered in their daily reading at home and in school.

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