THE NATURE OF PHONOLOGICAL AWARENESS DEFICITS OF LEARNERS IN CLASS SIX WITH READING DISABILITIES IN SELECTED SCHOOLS IN NAIROBI COUNTY-KENYA

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ABSTRACT

This study set out to investigate the phonological awareness skills of learners with reading disability. These learners should be identified and be assisted so that they can proceed with their learning lives. A sample of pupils in class six from the selected schools in Nairobi County was used in the study. The Phonological Awareness Theory was used in this study. The data were obtained from tape - recorded texts from the respondents. Tape recorded data were transcribed, analysed and then discussed. Various deficits in phonological awareness were observed. These were categorized as mis-articulations of substitution, reading of the entire word instead of identifying the sounds; spelling the words and segmentation. The mis-articulations were dominated by substitutions and atypical categories.

1.0 Introduction

Reading is a literacy component that should be acquired by all. This is because it is a crucial skill that is required in an individual's day to day activities. Anyone with disabilities in reading is bound to experience tremendous personal, economic and social limitations in today's word loaded with diverse information that call for effective reading. Within the schools' contexts, learners have to read and understand the various subjects they study in order to perform well in their examinations.

One of the essential elements of reading that formed the basis of the present study is the reading skill which involves the skill and knowledge to understand and recognize phonemes or speech sounds. The understanding of phonemes is largely referred to in reading studies as phonological awareness. It is the knowledge employed by readers to recognize words that rhyme, to identify the syllables in words and to recognize and manipulate sounds in words (Kirby, et al,. 2003). Learners who manifest deficits in phonological awareness have been found to experience persistent difficulties in word decoding (Blachman, 1991). Due to the significance of phonological awareness in the reading process, the present study sought to investigate the manifestations of phonological awareness deficits experienced by selected pupils in class six with reading disabilities in selected schools in Nairobi County.

Uwezo (2010) gave tests to establish the pupils' literacy and numeracy competencies based on class 2 curriculums. They found out that pupils enrolled beyond standard 3 were not able to pass tests. Moreover, almost one to ten pupils even in class 7 could not pass both the English and numeracy tests based on class 2 level. Another study that supports the prevalence of reading disabilities in schools is the study done by the South African Consortium for Measuring Educational Quality (SACMEQ, 2005). It established that 21% of pupils in class six reached the required level of reading while 66% reached the planned minimum but were

not likely to survive during the next year of schooling. These finding show that reading disabilities in all levels of school are real. This article presents the nature of phonological awareness kills of selected class six learners with reading disabilities. In this level, the pupils are expected to be able to read so as to learn the new; a failure to do this leads to failure in education activities (Mercer, 2001).

It is expected that children in class six in Kenyan primary schools have learnt to read as they prepare for their examinations in various subjects. That is, they should have the knowledge of the language to be used, be able to separate spoken words into component sounds, discriminate letters of the alphabet and also recognise printed words from a variety of cues such as: context, analogy or syntax. The present study endeavoured to establish the nature of these learners phonological awareness to ascertain if learners with reading disability also have deficits in phonological processing. The deficits in phonological awareness will be categorised as mis-articulation. The mis-articulations are discussed within the framework of Phonological Awareness Theory. To help achieve this goal, tests on phonological production, phoneme blending, phonological manipulation, phonological segmentation and non-word reading were used.

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. Judgmental or purposive sampling which entails identifying in advance the target variables for a specific purpose was used in this study. This presupposes the type of respondents to be studied (Punch, 2009). It is pointed that if the research questions highlight relationships between variables or comparison of groups, then judgment or purposive sampling is appropriate since it makes sense to select the sample in such a way that there is maximum chance for any relationships to be observed (Punch, 2009).

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.

2.3 Pilot Study

The pilot study was conducted in two primary schools. These schools were Kahawa Garrison Primary School and Pangani Primary School. Ten pupils identified as having reading disorders on the basis of the reading pre-test were engaged in the pilot study. The researcher then administered to the selected pupils the five phonological awareness subtests. The purpose was to familiarise with the administration of the test, to assess the suitability of the items in the tests and also to assess the applicability of the test items in an attempt to ensure the reliability of the test and the validity of the test items.

2.4 Research Instrument

Five subtests testing on phonological awareness were used in data collection. The data obtained were tape recorded and later transcribed.

2.4.1 Classification of Tests

There is no single standard set of test that measure phonological awareness (Cardenas, 2009). Typically, five types of skills are included in the domain of phonological awareness. The tests in this study were adopted from the work done by Levis, et al., (2007) and were modified to suit this study. They included: Non-word Reading Test, Phonological Production Test, Phonological Manipulation, Phonological Segmentation and Phoneme Blending Test.

2.5 Data Collection Procedure

The head teachers and the class teachers of the schools visited were useful in helping the researcher to get pupils to participate in this study. The head teacher introduced the class teacher to the researcher. The head teachers and the class teachers were assured that the study was being conducted for the sole purpose of writing a PhD thesis and that the data collected would be treated with utmost confidentiality. The class teacher then 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. After the above steps and after gaining the attention of the respondent, the researcher began the collection of the data. 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.

2.6 Data Analysis and Presentation

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 skills. The respondents' pronunciations that were different from the target expectations from each phonological awareness tasks were analysed as deficits in phonological awareness. These mis-articulations were presented and discussed under categories such as: substitution mis-articulations, phoneme deletion, phoneme insertion, atypical mis-articulations and segmentation mis-articulations.

3.0 FINDINGS AND DISCUSSIONS

3.1 The Nature of Phonological Awareness Skills of the Respondents

The present study approached the investigation from a phonemic point of view in the endeavour to determine the nature of the respondents' phonological awareness skills. This is with the assumption that children in class six, which the study established to be between the ages of 12 and 15 year olds, should not be experiencing reading difficulties because they have been taught how to read in the lower primary classes. A number of scholars argue that at age seven, children begin to spell phonetically. They can segment three to four phonemes in words. Many seven year olds can complete phoneme deletion tasks, that is, they are able to delete sounds from words (e.g. "moose" without the /s/ is "moo" (Goldsworthy, 1998; Justice & Schule, 2004).

From the summary of the development of phonological awareness at the age levels, it should be expected that children who are above 8 years old and regularly attend school should not experience difficulties in tasks involving phonological awareness. The respondents in this study were between the ages of 12 year olds and 15 year olds and were, therefore, expected not to exhibit any mis-articulations that portray their lack of phonological awareness. This study established that this was not the case with most of the respondents.

The phonological awareness theory also suggests the various tasks that can be used in determining the learners' skills in phonological awareness. These tasks include: rhyming, counting the number of phonemes in words, matching sounds in words, isolating sounds in words, deleting phonemes or syllables from words and blending phonemes to produce words and non-word reading and segmenting words into their constituent sounds (Anthony & Lonigan, 2004). The present study used a blend of these tasks. They included: non-word reading, phonological manipulation, phonological production, phoneme segmentation and phoneme blending to test the respondent's nature of phonological awareness. The next section exemplifies and explains the mis-articulations exhibited by the respondents.

3.2 Mis-articulations in the PA Tests

Responses of the respondents were categorised into various forms of mis-articulations after the transcription and the analysis of the tape-recorded data. The theory of phonological awareness indicates that a child who is able to perform the various phonological awareness tasks that involve sound blending, manipulation, and segmentation of words into phonemes will also have good word decoding abilities that are vital in fluent reading. Deficits in any of the phonological awareness skills are likely to result into disordered reading. The deficits of phonological awareness referred to as mis-articulations in the present study were categorized

as follows: Substitution; Letter Names; Phoneme Insertion; Phoneme Deletion and Atypical. These mis-articulations are thus exemplified and discussed in the sections that follow.

3.2.1.0 Substitution Mis-articulations

The substitution mis-articulations are discussed in two categories in this study. These are articulation substitutions involving consonant sounds and those involving vowel sounds.

3.2.1.1 Substitution of Consonant Sounds

Consonant sounds are classified according to some of the following distinctive features: manner of articulation, place of articulation and voice (Roach, 2009). Substitution mis-articulations observed in this study revolve round these three properties. During articulation of words, the substitution of any sound based on these distinctive features will result in a word which is not the target. Such substitution mis-articulations realised in the present study have been grouped into these three categories then explained. It should be noted that there could be an overlap of these properties while explaining the nature of the substitution.

A) Voicing Mis-articulations

Consonant sounds are termed as "voiced" if their articulation involves vibration of the vocal cords and "voiceless" if during their articulation, there is no vibration of the vocal cords. The examples below were classified under "voice" because the changes in words depended on whether the sound involved was voiced or voiceless.

Table 3.1: Voicing Mis-articulations

Target Sound	Substituted With	Example of words
/Ɵ/ (- voiced)	/ð/ (+ voiced)	Thed- /ɵed/
/b/ (+ voiced)	/p/ (- voiced)	boy- /bɔi/ , seb /seb/
/t/ (- voiced)	/d/ (+ voiced)	foot -/fʊt/
/g/ (+ voiced)	/k/ (- voiced)	wag -/wag/

The sound /Ɵ/ was substituted with the sound /ð/ in the non-word "thed" transcribed as /Ɵed/. The sound /Ɵ/ and /ð/ are produced in the same place of articulation. They are both dental sounds. However, the consonant /Ɵ/ is voiceless and the consonant /ð/ is voiced.

The respondents were to identify the first sound in the word /bɔi/. The sound /b/ was substituted with the sound /p/. This led to the word /bɔi/ being articulated as /pɔi/. The sounds /p/ and /b/ are produced in the same place. They are bilabial sounds. However, in terms of voicing, /b/ is voiced while /p/ is voiceless. Substitution of either in a word thus results in a change in the word articulated.

Another example is where the respondents were required to identify the last sound in the word "foot" transcribed as /fʊt/. The sound /t/ was substituted with the sound /d/. The response from the respondents was "food". The sounds /t/ and /d/ are produced when the blade of the tongue comes into contact with the alveolar ridge. They are thus called alveolar sounds. While /t/ is voiceless alveolar stop /d/ is its voiced counterpart. The last example here is that of the non-word "wag" transcribed as /wag/. In its production, there was a response "wak" which has /k/ as the last sound instead of /g/ which is in the target non-word. These two sounds /k/ and /g/ are velar sounds. They only differ in the property of voicing. /k/ is a voiceless velar stop while /g/ is its voiced counterpart. It is, therefore, observed that the respondents had a problem in distinguishing the voiceless phonemes from the voiced ones. For example, saying "wak" instead of "wag".

B) Mis-articulations due to Place of Articulation

Consonant sounds are produced along a continuum based on the movement of both the active and passive articulators within the vocal tract. These sounds are classified depending on the position within the vocal tract where constriction takes place during articulation. For example, /p/ is bilabial, /t/ is alveolar and /g/ is velar. Mis-articulations that were as a result of the substitution of sounds produced in different places are summarised in Table 3.2.

Table 3.2: Change of Place of Articulation Mistakes

Target Sound	Substituted with	Example of words
/b/	/d/	se<u>b</u>- /se<u>b</u>/, <u>b</u>lon- /blɔn, <u>d</u>oom- /du:m/
/d/	/b/	tru<u>d</u>-/tru<u>d</u>/, /trub/
/n/	/m/	Simfro<u>n</u>- /simfrɔ<u>n</u>/, /sinfrɔm/
/s/	/ʃ/	<u>s</u>nel -/<u>s</u>nel/, sheep -/ʃɪp/, shake - /ʃeɪk/

The consonant /b/ was substituted with the consonant /d/ in the non-word "seb" and "blon". This led to production of words such as "sed" and "dlon". The consonants /b/ and /d/ are stops. However, they are produced at different places within the vocal tract. The sound /b/ is produced when the lips come into contact thus it is a bilabial sound whereas the sound /d/ is produced when the blade of the tongue comes into contact with the alveolar ridge. Because they are somehow similar, the substitution of one for the other can be termed a case of reversal which is common in the reading of children with reading disabilities. This is also demonstrated in the articulation of the word "trud". Respondents replaced the sound /d/ with /b/ to read the non-word as /trub/.

Another example is that which involved two nasal sounds /m/ and /n/ in the non-word simfron /simfrɔn/. The two nasal sounds are produced when the velum is lowered then air is allowed to escape through the nose. Their places of articulation are different; /m/ is a voiced bilabial nasal whereas /n/ is a voiced alveolar nasal. These two nasal sounds are used in the same word; it is not easy to tell why the respondents articulated /m/ instead of /n/. For example, instead of reading the target word /simfrɔn/, there were responses as /sinfrɔm/.

The final example in this part involves the sounds /s/ and the sound /ʃ/ as was read in the non-word "snel" and the English words "shake" and "sheep". The two sounds /s/ and /ʃ/ are voiceless fricative sounds. However, the sound /s/ is produced when the tip of the tongue comes into contact with the alveolar ridge. The sound /ʃ/ is produced with the blade of the tongue against the post-alveolar region. The use of either sound in place of another usually results in a change of meaning. For example, in the Phonological Production test, the respondents were told to produce five words that began with the sound /s/. Some of the responses were: "sheep", "shake" and "she" which all begin with the sound /ʃ/ and not /s/.

C) Mis-articulations due to Changes of Manner and Place of Articulation

Under this section, examples of mis-articulations that were as a result of a combination of two distinctive features: manners of articulation and places of sound production are given and discussed. Place of articulation has been briefly explained above. Manner of articulation is the nature of constriction that takes place when the sounds are being produced. A sound can thus be classified as a stop, a fricative, a lateral and an affricate just to mention a few. Examples of mistakes of this nature are given in the Table 3.3.

Table 3.3: Manner and Place of Articulation Mis-articulations

Target Sound	Replaced with	Example of words
/r/	/l/	ruk /ruk/
/ʃ/	/ʧ/	shob -/ʃɔb/
/f/	/p/	phim /fim/

As shown in the table above, the sound /r/ was replaced with the sound /l/ in the non-word "ruk" transcribed as /ruk/. This made the resultant non-word be "luk". Even though the sound /l/ and /r/ are voiced, the sound /r/ is called an alveolar approximant while /l/ is called a lateral approximant. A substitution of one of these two sounds in the same word position leads to new words with different meanings.

The second example involves the sounds /ʃ/ and the sound /ʧ/. The sound /ʃ/ is a voiceless post-alveolar fricative whereas the sound /ʧ/ is a voiceless post-alveolar affricate. Both sounds are represented in orthography by diagraphs <sh> for /ʃ/ and <ch> for /ʧ/. However, they are realised as individual sounds though the phonetic symbol for <ch> contains two symbols. The affricate /ʧ/ is a stop released into a fricative. The substitution of the sound /ʃ/ with /ʧ/ brings forth a change in the structure of the non-word /ʃɔb/ to /ʧɔb/.

The last example is that which involves substitution of the sound /f/ with the /p/. This happened in the articulation of the non-word "phim". The consonant in the onset of the non-word was to be articulated as /f/. There were instances where the respondents articulated the target word as /pim/. The sound /f/ is a voiceless labio-dental fricative whereas the /p/ is a voiceless bilabial stop. The respondents who read "phim" transcription /fɪm/ as /pɪm/ lack the awareness that there are words that contain diagraphs (which are two letters in the spelling) of a word but are realised as one sound in actual speech.

3.2.1.2 Substitution Mis-articulations with the Vowel Sounds

Correct articulation of English vowels is normally a big challenge for children and even adults whose first language is not English (Chen, 2009). For one to be able articulate these vowels correctly he or she would need to practice their (vowels) articulations in various English words.

A) Parameters used in Identifying Mis-articulations of Vowels

According to Roach (2009), there are different parameters used to classify vowel sounds: vertical tongue height, horizontal tongue position and the shape of the lips. In terms of vertical tongue height, a vowel sound can be said to be high, mid-high, mid-low or low. In terms of horizontal tongue position, a sound can be said to be front, central or back. In relation to the shape of the lips, a sound is either spread, round or neutral. These parameters are used in describing the substitution mis-articulations involving the use of vowel sounds in this study.

Table 3.4: Vowel Classification Mis-articulations

Target Sound	Substituted with	Example
/e/	/ɪ/	S<u>e</u>b
/ɒ/	/ʊ/	y<u>o</u>k, b<u>a</u>ll
/ʊ/	/ɑ/	tr<u>u</u>d, r<u>u</u>k
/ʊ/	/ʌ/	<u>u</u>mbrella, <u>u</u>nder

The Table 3.4 above gives examples of the target sounds and the sounds that they were substituted with, in the Non-word Reading task and the Phonological Production task. The first example is the one which involves the substitution of the front mid-high spread vowel /e/ with a front high spread vowel /ɪ/. Articulations of either sound in place of the other results in

a different sound and can even change the meaning of a word. For example, the substitution of the vowel /e/ with the vowel /ɪ/ in the non-word "seb" leads to a new non-word "sib".

The second target vowel was the mid-low back round vowel /ɒ/. It was substituted with the high back round vowel /ʊ/. Both of these vowels are, therefore, back and round. But a substitution of /ɒ/ with /u/ resulted in the non-word /jɒk/ being read as /jʊk/ and ball- /bɒl/ read as /bʊl/. The third example involves the sounds /u/ and /a/. The vowel /u/ is high back round vowel while /a/ is a low front spread vowel. The replacement of /u/ with /a/ in articulating the non-word /trʊd/ ended up with a non-word /trad/ and /rʊk/ was also read as /rak/. It can be assumed that the respondents were transferring their knowledge of sight word vocabulary to read these words. This is, because, in many words in English orthography, that have the letter "u", the 'u' is mostly pronounced as /ɑ/.

The fourth example is that of the vowels /ʊ/ and /ʌ/. The vowel /ʊ/ is a back high round vowel while /ʌ/ is a mid-close central neutral vowel. Substitution of /ʊ/ with /ʌ/ resulted in articulation of words such as "umbrella", "under" just but to mention a few. Here the respondents were applying their letter knowledge to tackle the task rather than providing the words which began with the sound /ʊ/. A transcription of the words "umbrella" and "under" reveals that the initial sound at each of the words is the sound /ʌ/. These examples were a manifestation that the respondents experienced difficulties in identifying the appropriate vowel phonemes in the target non-words and in the Phonological Production task where they were expected to come up with words that began in the vowel sounds given as test items.

B) Short versus Long Vowels

These are substitutions that were as a result of a change of the quality of the vowel from the short vowel expected in the target to a long vowel in the Phonological Production task. This is exemplified in Table 4.5 below.

Table 3.5: Substitutions of Vowel Length

Target Sound	Substituted with	Example of words
/æ/	/a:/	artist, aunt
/æ/	/ɔ:/	author, audience
/ɒ/	/ɔ:/	orphanage, orderly
/e/	/i:/	eagle, easter

A change in the meaning of an English word can stem from the length of the vowel used in the word. The sound /æ/ is a short front mid-low vowel. It was substituted with the long vowel /a:/ when respondents were instructed to produce English words that began with the vowel /æ/. Examples of the words they produced were "artist" transcribed as /a:tist/ and "aunt" transcribed as /a:nt/. Another substitution mistake realized with the sound /æ/ was where respondents produced words that began with the long vowel /ɔ:/ examples of words given were: "author" and "audience". A transcription of these two words reveals that the initial sound in the words is the long /ɔ:/ (author -/ɔ:θəə/ and audience - /ɔ:dɪəns/. The short vowel /ɒ/ was also substituted with the long vowel /ɔ:/ The responses given by the respondents were: orphanage and orderly. A transcription of these two words also shows that they begin with the long vowel /ɔ:/ instead of the short vowel /ɒ/ (e.g. "orphanage" - /ɔ:fənɪʤ/ and "orderly"- /ɔ:dəlɪ/. The last example in this section is where the responses that were expected were to begin with the mid-high front vowel /e/. Some of the words produced did not have the sound /e/. This was substituted with the long vowel /i:/. Examples are: "eagle" - /i:gl/ and "easter" - /i:stə/. These mistakes are a confirmation that the respondents' letter knowledge does not correspond to the sound knowledge. A child with good phonological awareness will be aware of the sounds in a word in addition to knowing the letters that make up that word. This is called letter-sound knowledge (Arrow, 2007).

C) Short Vowels versus Diphthongs

Apart from the short vowels and the long vowels, English also has diphthongs. Diphthongs are instances where there is a glide from one vowel sound into another. Articulating a diphthong in a word contains a short vowel or a long vowel results in mispronunciation.

Table 3.6: Short Vowels Substituted with Diphthongs

Target sound	Substituted with	Example of words
/ɪ/	/aɪ/	Hik
/ɪ/	/eɪ/	Plin
/æ/	/eɪ/	aeroplane, age
/ɒ/	/əʊ/	oval, opaque

The short vowel /ɪ/ was substituted with the diphthong /aɪ/ in the articulation of the non-word /hɪk/. This resulted in the word /haɪk/ -"hike" which is an English word while the respondents were required to read aloud the non-word. Another example is where the sound /ɪ/ was replaced with the sound /eɪ/ to articulate the non-word /plɪn/ as /pleɪn/. Moreover, there was a mis-articulations made in producing sounds that began with the sound /æ/. /eɪ/ was used instead of the short vowel /æ/. Examples were: "age" - /eɪʤ/ and "aeroplane"- /eɪrəpleɪn/. Lastly, the short vowel /ɒ/ was substituted with the diphthong /əʊ/ when respondents were producing words which began with the short back mid low round vowel /ɒ/. Examples of such words were: "oval" - /əʊvl/ and "opaque" - /əʊpeɪk/.

D) Letter Naming

The mis-articulations of naming letters instead of articulating the sounds was realized more in the Phonological Manipulation test than any other test used in this study. In the Phonological Manipulation test, the respondents were expected to identify the first sound, the missing sound and the last sound in the English words given.

Table 3.7: Target Sounds and Letters

Target Sound	Letter	Target Sound	Letter
/b/	b	/dʒ/	j
/k/	c	/t/	t
/d/	d	/n/	n
/f/	f	/p/	p
/g/	g	/s/	s

As shown in Table 3.7, the respondents identified the letters instead of the sounds that appeared in word positions which they were to identify. Even though this is not a clear demonstration of phonological awareness, literature shows that letter knowledge is a key component in training children how to read (Arrow, 2007 and Dahmer, 2010). The letter knowledge is normally acquired through the phonics approach. When phonics approach is combined with teaching of phonological awareness, studies show that this would enhance children's reading abilities. The combination of the two can also be used in the intervention programmes for children with reading disabilities (Ehri, et al., 2001b; National Reading Panel, 2000). From Table 4.7, it can also be observed that the respondents had a challenge of identifying the first sound in the word "computer", they identified it as <c> instead of /k/.

E) Phoneme Insertion

In the Phoneme Manipulation test, the respondents were expected to identify the initial sounds in words, missing sounds and the last sound. This was the test where there were numerous insertions of the vowels in identification of various consonants.

Table 3.8: Phoneme Insertion Mis-articulations

Target Sound	Phoneme Inserted	Examples of articulations
/b/	/ɒ/	/bɒ/
/f/	/ɪ/	/fɪ/
/f/	/aɪ/	/faɪ/
/dʒ/	/a/	/dʒa/

While identifying the sounds in the initial position of the word "boy", the back mid-low round vowel /ɒ/ was inserted so that the respondents' answer was /bɒ/. In identification of the first sound in the word "five" which is /f/, the respondents inserted the front high spread vowel /ɪ/ and the diphthong /aɪ/ as shown in the table above. The last example here involved the articulation of the first sound in the word "jump". When this word is transcribed, the sound that appears at the initial position is the post-alveolar affricate /dʒ/. The front open low vowel /a/ was inserted after /dʒ/ so that their response was /dʒa/.

The mis-articulations presented here are not serious phonological awareness problems (McBride-Chang, 1999). The vowel sounds that are inserted after the target phonemes tend to influence the way the respondents articulated the phonemes. Even though this shows no serious identification problems, it is noted that these respondent are lacking in the awareness of the segments that should go into the different parts of a syllable. A syllable has an onset and a rhyme. The onset is the initial consonant sound in a word.

The rime is made up of a nucleus and a coda. A vowel is the nucleus of a syllable while a coda is a consonant sound terminating the syllable. When a child is aware of the onset and the rime, he or she will segment a word into the categories of onset and the rime. The examples in Table 4.8 show that the respondents were not aware that the onset of a word should only contain the initial consonant sound and that the vowel sound is part of the rime. When teaching phonological awareness skills to children, they should be made aware of how to identify the sounds that go to the onset and the ones that are part of the coda. Such awareness has been shown to aid the children in acquiring reading competence (Lonigan, et al., 2000; Tunmer & Chapman, 2007).

F) Phoneme Deletion

Phoneme deletion is a phonological process where a speaker omits a sound or sounds that are expected to be articulated in a word. Mis-articulations as a result of deletion were not common in the respondents' answers. Table 4.9 gives a summary of examples of such mis-articulations.

Table 3.9 Deletion of Sounds

Target Word	Sound Deleted	Words Articulated
yok /jɔk/	/j/	ok /ɔk/
plin /plin/	/l/	pin /pin/
skad /ska/	/k/	sad /sæd/

In Table 3.9 above, it is shown that there was a deletion of the palatal approximant /j/ so that the non-word "yok" -/jɔk/ was read as "ok" and in the non-word "plin" the lateral approximant /l/ was deleted and the word read as /pin/. Lastly, the non-word "skad" was read aloud as "sad" because the voiceless velar stop /k/ was deleted.

From these examples, it was observed that the responses were instances of recall. This could be due to the fact that the respondents were trying to recall some of the English words that might be part of their vocabulary (sight words). The words "pin" and "sad" are English words while the target words were non-words.

G) Atypical Mis-articulations

Atypical mis-articulations are instances where the respondents produce a totally different word from the target word or a distortion of the target word. They are serious manifestations of lack of phonological awareness in readers. Examples of such mis-articulations are given in the Table 4.10.

Table 3.10: Atypical Articulations

Target Word	Atypical Articulations
skad -/skad/	chair, ask, snack
chub -/ʧub/	child, sick, dip
keep -/kip/	cook, car, cake
ball - /bɒl/	blue, blood, bell

The target sounds in the non-word "skad" were the voiceless fricative /s/, the voiceless velar stop /k/, the front open low vowel /a/ and the voiced alveolar stop /d/. Atypical articulations made by the respondents were: "chair", "ask" and "snack". The non-word /skad/ has a structure of CCVC, /æsk/ has a structure of VCC, /snæk/ has a structure of CCVC and /ʧeiə/ has a structure of CV. The production of the word /snæk/ is atypical because, one, it is an English word and two, the sounds that make it up are different from those found in the non-word "skad" except for the alveolar fricative /s/ which occurs at the onset of each and the velar stop /k/ which occur in different word positions. The word "ask" is also atypical because it has the structure of VCC while the target is CCVC and even though it contains the sounds /a/, /s/ and /k/ that are also in "skad" it is not near it in articulation. The word "chair" contains the post-alveolar affricate /ʧ/ and the triphthong /eiə/ both of which are not found in the target non-word.

The second example of atypical mistakes is explained from the articulations that stemmed from the responses given for the non-word "chub". The target sounds in this non-word are: the post-alveolar affricate /ʧ/, the high back round vowel /u/ and the voiced bilabial plosive /b/. The structure of "chub" is CVC. Atypical mis-articulations here were: /ʧaɪld/ - CVCC, /sɪk/- CVC, /dip/- CVC. All these words are English words and the target word was a non-word.

Atypical mis-articulations in the blending task were also quite many. In this section, two examples are explained. The English word "keep" -/ki:p/ was articulated as "cook", "car" and "cake". /ki:p/ has a structure of CVC, /kuk/ has a structure of CVC and /keik/ also has a structure of CVC. The word /ka:/however has a structure of CV. These words may also have been arrived at as a result of guess work. Lastly, in the articulation of the word "ball" -/bɔ:l/, some of the responses given were: "blood", "bell" and "blue". Even though they begin with the sound /b/, they are completely different from "ball". For instance, -/bɒl/ has the structure of CVC while /blʌd/ has a structure of CCVC and two sounds in /blʌd / (/ʌ/ and /d/) are not found in the target word / bɒl/. Even though /bɒl/ and /bel/ have a structure of CVC, the vowel sounds found in their nucleus are different thus their substitutions lead to a different word with a different meaning. The word /blu:/ on the other hand, has a structure of CCV while the target word /bɒl/ has a structure of CVC. Atypical mis-articulations show very serious deficits in the respondents' phonological awareness. They are major indicators that a child has serious reading disabilities and should thus be put into a remediation programme for speedy intervention for the child to overcome reading challenges.

3.3.0 Analysis of Mis-articulations in Segmentation

These are mis-articulations made while attempting to identify the individual sounds in the words that were given in the phoneme segmentation test.

3.3.1 Spelling the Words

Some of the respondents spelled the words instead of identifying the individual sounds that made them up. These respondents were aware that words are made up of letters of the alphabet. They could identify the graphemes that made the words up but they could not identify the sounds in the words. For example, the word "hand" was to be segmented into /h/, /æ/, /n/ and /d/. Some spelled it as < h >, < a >, < n > and < d >. Another example was the

word "foot". It was to be segmented into /f/, /ʊ/ and /t/ but one of the responses was < f >, < o >, < o >, and < t >. This was also a manifestation of respondents' letter knowledge but this letter knowledge could not be transferred to sound knowledge. Such respondents lacked letter-sound knowledge which is very vital in performance of phonological awareness tasks that test on the segmenting skills at the phonemes level.

3.3.2 Pronunciation of the Entire Word

The task required the respondents to identify the phonemes that made up the words. 25.6 percent of the respondents opted to read the entire word instead of identifying the segments that made them up. This is an indication that phoneme segmentation is a difficult task among the phonological awareness tasks. For instance, instead of identifying the sounds in the word "knee" as /n/ and /i:/, their response was "knee". Moreover, instead of identifying sounds in the word "friend" as /f/, /r/, /e/, /n/ and /d/, their response was "friend". This is evidence that the respondents lacked the phonological awareness of identifying phonemes in words.

3.3.3 Splitting the Word

It was noted that 32% of the respondents could not identify the individual phonemes in the words. Various mistakes were realised in the performance of the respondents. First, the most common mistake was where the respondents split the word into two with the vowel in the word combined with the initial consonant in the word and the remaining consonants grouped as a cluster. Examples, instead of identifying the phonemes in the word "hand" as /h/, /æ/, /n/ and /d/, the respondents split the word as "ha – nd". The target sounds in the word "friend" were /f/, /r/, /e/, /n/ and /d/, the respondents split it to "fre – nd" and in the case of the word "foot" where the target phonemes were /f/, /ʊ/ and /t/, the respondents split it to "fu – t".

The second mistake was where the respondents grouped the vowels in the word with the final consonant in the words. Examples, "n – os" and "f – ut". These are instances where the

respondents could segment the initial phonemes only but still failed to segment the other phonemes in the words.

From these observations, it is evident that the respondents were aware that words can be split but they are still lacking the phonological awareness that words can also be split further into smaller units called phonemes. This confirms the findings in literature that segmenting at the phoneme level is one of the most difficult tasks for children learning to read (Chen, 2009; Armbruster, et al., 2004)   Phonological awareness is thought of as a continuum of increasing awareness and ability to manipulate increasingly segmented sub-syllabic units (Burgess, 2002). At the lower end of the continuum, children are able to distinguish and manipulate onset-rime units and at the highest end, children are able to distinguish and manipulate phonemes (Anthony & Lonigan, 2004).

3.4 Conclusion and Recommendation

The results of the present study allow certain conclusions to be made in relation to the assumptions of the study. The assumption of the study was that there are manifestations of phonological awareness deficits by learners in class six with reading disabilities. The discussion of the results has confirmed this from the analysis of the various categories of the mis-articulations that were made by the respondents in answering the phonological awareness tasks. The mis-articulations were dominated by substitutions and atypical categories. The study can therefore conclude by accepting this assumption. The conclusion is that class six learners with reading disabilities also have deficits in their phonological awareness skills.

The findings of this study also support earlier studies that have indicated that phonological awareness is one of the basic components of efficient reading acquisition. It also points out the various phonological awareness measures that children should be trained on for them to

be better word decoders. Examples are: phoneme blending skills, phoneme manipulation skills and phonological segmentation skills.

Lastly, it is also recommended that standardized diagnostic tests be developed to test the children's reading at the primary school level. Such tests should be rolled out in all the schools in Kenya so that children who are identified to have deficits in learning can be put into remediation classes. The remediation programmes should contain instructions and learning activities that will enable the children to overcome their phonological awareness deficits. If possible, speech and language therapists should be trained and deployed to schools to assist children with any form of learning deficiencies.

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