

# **The Effects of Phonological Awareness on Word Formation and Decoding Skills of Disabled Readers**

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## **Abstract**

In the recent times, educators and researchers have focused attention on the identification of methods to increase the effectiveness of reading instruction in our schools. One of the most compelling and well-established findings in this field of research is the important relation between phonological awareness and reading. This study examined the effects of phonological awareness on the word formation and decoding skills of disabled beginning readers. Data gathered using a quasi-experimental design involving 100 pupils in experimental and control conditions showed significant achievement on the skills of decoding  $t(98) = 15.22$   $p < 0.05$  and word formation  $t(98) = 16.02$   $p < 0.05$ . The implications of the findings of the study for reading instruction in developing countries are drawn.

## *Introduction*

The intractable problem of producing unskilled readers in English especially in countries where English is taught as a second Language (ESL) calls for intervention research. It appears that much of our educational ineffectiveness in teaching reading to children is the result of failure on the part of teachers to draw from the knowledge base about reading and reading disabilities that have been provided by researchers in this field of study (Okebukola, 2004). What we need is research on schools and teaching that will help us understand how to make effective the instructional procedures we already know about part of the curriculum teaching disabled children in our schools. Phonological awareness (PA) has been identified as one of such strategies (Adams, 1990; Ehri, 1991; Stanovich, 1994 and Tafa & Manolitsis, 2008).

Phonological awareness has been described as the ability to perceive spoken words as a sequence of sounds (Spector, 1992) the awareness of and access to the sounds of language (Wagner and Torgesen, 1987), the ability to deal explicitly and segmentally with sound units smaller than the syllable (Stanovich, 1994) and the ability to analyse and manipulate units of sound in speech (Chen, Ku, Koyoma, Anderson & Li, 2008).

The levels of phonological awareness development are associated with the different phonological components of spoken language including words, syllables, onsets and rimes, and phonemes (Adams, 1990). These four levels of phonological awareness are described below:

*Word Level.* The awareness that the speech flow as a compilation of individual words is typically achieved at a very young age. The linguistic play of young children, including rhyming and the generation of nonsense words, evidence of this early level of phonological awareness (Bradley, 1988). When a child utters a single word that he has only heard in combination with other words, he is demonstrating the word level of phonological awareness.

*Syllable Level.* Syllables are the most easily distinguishable units with words. Most children acquire the ability to segment words into syllables with minimal instruction. Activities such as clapping, tapping and marching are often used to develop syllable awareness. This level of phonological awareness is useful for initial instruction in detection, segmentation, blending and manipulation of phonological components of language. The ability to detect, segment and count

syllables is more important to reading acquisition than the ability to manipulate and transpose them (Adams, 1990).

*Onset and Rime Level.* The onset-rime or intrasyllabic level of phonological awareness is an intermediate and instructionally useful form of analysis between the syllable and the phoneme (Adams, 1990). The onset is the part of the syllable that precedes the vowel (e.g. the /k/ in cat, the /br/ in brown). The rime is the rest of the syllable (e.g. /og/ in dog, the /ack/ in black). Because a syllable must contain a vowel, all syllables must have a rime, but not all syllables have an onset (e.g. and, out, or)

Instruction at the onset-rime level is an important step for many children (Treiman, 1992). Because tasks that require onset and rime analysis require the segmentation of syllables, they are more sophisticated than syllable-level tasks. Yet these same tasks are easier than phoneme-level tasks because they do not require discrimination between individual phonemes. Onset-rime tasks could, therefore, be considered an intermediate step in the development of phonological awareness. The difficulty that many children experience when progressing from syllabic analysis to phonemic analysis may arise because the intermediate step, the intrasyllabic unit, is often omitted from early reading instruction. Providing experience working with onsets and rimes may alleviate this difficulty.

*Phoneme Level.* The most sophisticated level of phonological awareness is the phoneme level, most commonly referred to as phonemic awareness. Children with strong phonemic awareness are able to manipulate individual phonemes, the smallest sound units of spoken language. Phonemic awareness skills include the ability to detect, segment, and blend phonemes and to manipulate their position in words (Adams, 1990).

Because humans coarticulate or overlap sounds in speech, phonemes are impossible to segment in a pure sense. In the speech flow, phonemes are formed and blended in such a way that one phoneme's production is influenced by the surrounding phonemes. For example, the /k/ is formed in slightly different ways in the words cat and cot due to the influence of the vowel that follows it. Because phonemic analysis requires the reader to detect, segment, and manipulate individual phonemes, it is a much more sophisticated task and, consequently, a much more difficult task than either syllabic or intrasyllabic analysis (Treiman, 1992).

Children demonstrate Phonological Awareness by segmenting words into syllables, producing rhyming words, identifying individual sounds in words, combining sounds to make a word or dividing words into constituent sounds (Stadler, Watson & Shaken, 2007).

Reading disability within the context of this study refers to defective literacy resulting from educational neglect or inadequate instruction. It is to be distinguished from that which involves the inability of a reader to decode the printed symbol of a given alphabetic system; that is, one whose condition is that of being unable to thrive pedagogically and unable to profit from standard methods of instruction as a result of physical or biological handicaps like dyslexia, aphasia, stuttering, visual impairment, low intelligence among others.

This study was designed to determine the effects of phonological awareness on the decoding and word formation skills of disabled readers. Possible gender differences were also explored. Improved reading instruction deserves high priority not only because the large majority of children with learning disabilities have reading difficulties as their primary academic problem, but also because reading difficulties have such a serious impact on the overall educational outcome of these children. The study will unveil the usefulness of phonological awareness in helping disabled readers overcome their reading problems. It will also help teachers of reading as well as curriculum planners to design effective reading instruction programmes.

The following hypotheses were tested at 0.05 level of significance:

1. There will no significant difference in the decoding skills of disabled readers who are taught phonological awareness and those who are not.
2. There will no significant difference in the word formation skills of disabled readers who are taught phonological awareness and those who are not
3. There will be no significant effective of treatment on male and female disabled readers in the measures of decoding and word formation skills.

## *Methodology*

### *Participants*

Participants were 100 primary six disabled readers randomly selected from four primary schools in Ado Odo/Ota Local Government Area of Ogun State Nigeria. Participants ranged in age from 10 – 12. 50 pupils were in the experimental group and 50 in the control group. Participants were children identified and adjudged disabled by their class teachers.

For the purpose of data collection, three instruments were used.

#### 1. Phonological Awareness Teaching Syllabus (PATs)

Revision of the letters of the alphabet.

Instruction in Grapheme – phoneme correspondence

Orthographic Symbols	Phonemic Symbols
a	/ a / as in ant
b	/ b / as in bat
c	/ c / as in cat
d	/ d / as in dog
e	/ e / as in egg
f	/ f / as in fan
g	/ g / as in goat
h	/ h / as in hat
i	/ i / as in ink
j	/ j / as in jug
k	/ k / as in king
l	/ l / as in leg
m	/ m / as in man
n	/ n / as in net
o	/ o / as in old
p	/ p / as in pen

q	/ q / as in queen
r	/ r / as in rain
s	/ s / as in sun
t	/ t / as in tent
u	/ u / as in <u>w</u> ood
v	/ v / as in van
w	/ w / as in wall
x	/ x / as in xylophone
y	/ y / as in yellow
z	/ z / as in zoo, zebra

2. Test of Decoding Skill (TEDS). It contains ten word recognition items, five each of word deletion, syllables blending, matching rhymes, blending onsets and rhymes and blending rhymes. Developed with adaptations from Phonological Awareness Assessment (Lane, 2002).

*Test of Decoding Skills (TEDS)*

<i>A</i>	<i>B</i>
<i>Assessment</i>	<i>Question</i>
<i>Word level</i>	
Reading words	Teacher writes the following words on the board. Student reads each word: man, pot, pet, bet, pap, lamp, mop, men, win, gate
Counting words	Teacher reads sentence aloud, student count each word in the sentence. The man is eating The girl is sitting The gate is open The lamp is on the wall The dog is running

Deleting words

Teacher reads the following

compound words, the student deletes the first word:

football

motorcycle

housejob

cowboy

household

### *Syllable Level*

Blending syllables

Teacher reads the following words one

syllable at a time. children listen, then blend the sounds together to make the whole words

tai\_lor

tea\_cher

lea\_dea

la\_dy

ba\_by

### *Onset – Rime Level*

Matching Rhymes

Teacher gives the following word pairs, students decide whether or not the pair rhymes:

sack / black

beat / been

game / gem

map / tap

bat / jet

Blending onsets and rimes

Teacher segments the word orally between the onset and rime. The children listen, then blend the whole sounds together to make the whole word:

n\_ote

gl\_ad

pr\_ay

fr\_og  
sl\_eep

### *Phoneme Level*

Blending phonemes

Teacher segments the following words into phonemes and the children are asked to blend the sounds to make the whole word.

k\_i\_te

l\_a\_ke

b\_a\_th

t\_e\_ll

e\_gg

3. *Test of Word Formation (TESQWOF)*. This contains 10 word blending items.

Blend these sounds together to form English words

No.	Sounds	Words
1.	/ o / b / y /	boy
2.	/ a / n / c /	can
3.	/ t / o / w /	two
4.	/ i / n / r /	run
5.	/ e / p / n /	pen
6.	/ o / w / f / l /	flow
7.	/ i / r / l / g /	girl
8.	/ d / s / n / e /	send
9.	/ g / v / i / e /	give
10.	/ n / m / a / e /	name

### *Method of Scoring*

The tests were scored by assigning one point to each question correctly answered and zero to a wrong answer. The total number of items is 50, total score is calculated using percentages.

All instruments were developed by the researcher and validated by three experts in Language Education. The tests were subjected to test – retest reliability using Pearson product moment correlation coefficient with a score of 0.82, 0.76 and 0.86 respectively.



### *Design and Procedure*

A pretext – posttest control group design was used for the study. The experiment began with the administration of TEDS and TESWOF in the experimental and control groups as pre-test to ascertain the strength of evidence as presented by the teachers. The experimental group pupils had eight weeks of instruction on the 4 levels of Phonological Awareness development (Adams, 1990) as described earlier.

The teaching was scheduled as follows:

Week 1 – Pretest teaching of pure vowels sounds, word samples and manipulation of sounds

Week 2 – Diphthongs and sample occurrences

Week 3 – English consonants and sample occurrences

Week 4 – Consonant clusters

Week 5 – Phoneme deletion, word to word matching

Week 6 – Phoneme segmentation and Rhyming

Week 7 – Revision

Week 8 – Post-test

The tests were scored by assigning a point to each question correctly answered and zero to a question wrongly answered.

### *Data Analysis and Findings*

The dependant variables were analyzed by finding the means, standard deviation with the application of t-tests.

The main effect due to treatment was significant in favour of the experimental group. Decoding skills  $t(98) = 15.22$   $p < 0.05$

*Table 1.0* Showing means, standard deviation and t-test comparing achievement in decoding skill

<i>Groups</i>	<i>No. of Subjects</i>	<i>Mean Score</i>	<i>Standard Deviation</i>	<i>T-Value Calculated</i>	<i>T-Value Observed</i>
Experimental	50	56.92	10.26	15.225	
Control	50	30.30	8.48		

It was also significant in word formation  $t(98) = 16.02$   $p < 0.05$ . Females outperformed the males in decoding and word formation skills (57.40 and 56.84).

*Table 2.0* Showing means, standard deviation, and t-test comparing achievement in word formation skill

<i>Groups</i>	<i>No. of Subjects</i>	<i>Mean Score</i>	<i>Standard Deviation</i>	<i>T-Value Calculated</i>	<i>T-Value Observed</i>
Experimental	50	69.32	21.56	16.022	
Control	50	19.80	10.08		

### *Discussion and Conclusion*

The findings of this study provide evidence supporting the evidence that disabled readers are impaired in a very wide range of tasks in the phonological domain (Fletcher et al., 1994 and Stanovich, 1994). These deficits are consistently found to be domain specific, longitudinally predictive and not primarily attributable to non-phonological factors such as general intelligence, semantic or visual processing. Additionally, disabled readers display performance deficits on rhyme production tasks (Bentin, 1992).

It is also evident in this study that reading difficulties are associated with poor performance in tasks that demand a deeper form of phonological sensitivity in particular, tasks that require the more explicit forms of phonemic segmentation. This agrees with research findings that poor readers display large deficits on a variety of different skills that require the complete segmentation of a word or non-word into phoneme units (Bentin, 1992; Bruck, 1992 and Wagner et al., 1993). The findings of this study agree with the position of some researchers that PA develops primarily through literacy instruction. They propose that PA lies dormant until a young child experiences instruction in an alphabetic language (Walley et al., 2003).

The superior performance of the experimental group underscores the importance of integrating phonics instruction into beginning reading and remedial programmes. In a study conducted by Okebukola (2002) beginning readers benefited from phonics instruction and performed significantly better than the control group. Research has also shown that PA training before literacy instruction improves reading outcomes and that children do develop PA before reading instruction (Philips, Clancy-Menchetti & Lonigan, 2008). Badian (2001) showed that pre-school phonological awareness contributed to reading in Grades 1 and 3.

The results further recorded significant difference in the performance of male and female subjects in decoding and word formation skills in favour of girls. Previous studies in the area of gender and reading achievement endorsed the imbalances in the reading achievement of boys and girls recording boys' lower test scores and higher remedial class placements in literacy related fields relative to the scores and placements of girls (Blackburn, 2003). Ofsted (1993) noted that boys do not do as well as girls in reading in schools and that there are contrasts in performance and attitudes towards the subject. Other works in which gender imbalances are implicated in favour of girls include those of Cappay and Madden (1975); Gorman and Whitehead (1975), White and Brooks (1988).

Responses in reading therefore seem to be clearly implicated in the gender differences reported (Okebukola, 2002). The implication of this is that educators should be encouraged to help boys identify literature that interests them. Boys' interest must be considered when selecting texts. Books with positive male archetypes are important and adults must model engaged reading (Blackburn, 2003).

Although phonology may not be critical for skilled readers, it is doubtless that novice and disabled readers depend heavily on print – to – sound translation. Equipped with an extensive oral vocabulary, the disabled reader brings to the reading domain a large store of word meanings accessible via phonology. Mastering the systematic relationships between print and sound permits the learner to capitalize on these existing links (Share and Stanovich, 1988).

Note: The assistance rendered by Apari, W.J. during the data collection phase of the study is acknowledged by the researcher.

## References

- Adams, M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Badian, N.A. (2001). Phonological and orthographic processing: Their roles in reading prediction. *Annals of Dyslexia* 51, 179 – 202.
- Bentin, S. (1992). Phonological awareness, reading and reading acquisition. In R. Frost & L. Katz (eds). *Orthography, Phonology, Morphology and Meaning*. (pp. 193 – 210), Amsterdam: North – Holland.
- Blackburn, M. (2003). Boys and literacies: What difference does gender make? *Reading Research Quarterly*, 38, 276 – 287.
- Bruck, M. (1992). Persistence of dyslexics' phonological awareness deficits. *Developmental psychology*, 28, 874 – 886.
- Ebri, L. (1991). Finger point – reading of memorized text: What enables beginners to process the print. *Reading Research Quarterly*, 24, 442 – 462.
- Chen, X.; Ku, Y.M.; Koyama, E.; Anderson, R.C. & Li, W. (2008). Development of phonological awareness in bilingual Chinese children. *Journal of Psycholinguistic Research* 37, 405 – 418.
- Fletcher, J.; Shaywitz, S.; Shankweiler, D.; Katz, L.; Liberman, L.; Stuebing, K.; Francis, D.; Fowler, A. & Shaywitz, B. (1994). Cognitive profiles of reading disability: Comparisons of discrepancy and low achievement definitions. *Journal of Educational Psychology*. 86, 6 – 23.
- Gorman, T.; White, J. & Brooks, G. (1988). Explaining the differences between dyslexics and the garden-variety poor reader the phonological core variable difference model. *Journal of Learning Disabilities*, 21, 590 – 612.
- Ofsted, P. (1993). *Boys and English* London: HMSO.
- Okebukola, F. (1999). A Comparative study of the performance of emergent readers in public and private schools in reading skills. *Nigerian Education Review* 5, 18 – 21.
- Okebukola, F. (2002). How differently are boys and girls? *Educational Perspectives* 5, 1, 100 – 107.
- Philips, B.M.; Claney-Menchetti, J. and Lonigen, C.J. (2008). Successful phonological awareness instruction with pre-school children: Lessons from the classroom. *Topics in Early Childhood Special Ed.*....., 28, 3 – 17.

- Share, S. & Stanovich, K. (1988). Explaining the differences between dyslexics and the garden-variety poor reader the phonological core variable difference model. *Journal of Learning Disabilities*, 21, 590 – 612.
- Stadler, M.A.; Watson, M. & Sh-kan, S. (2007). Rhyming and vocabulary: Effect of lexical restructuring. *Communications Disorders Quarterly* 28, 197 – 205.
- Stannovich, K. (1994). The phenotypic performance profile of reading – disabled children: A regression – based test of the phonological core variable – difference model. *Journal of Educational Psychology*, 86, 24 – 53.
- Spector, J. (1992). Predicting progress in beginning reading: Dynamic assessment of phonemic awareness. *Journal of Educational Psychology* 84, 353.
- Tafa, E. & Manolitsis, G. (2008). A longitudinal literacy profile of Greek precocious readers. *Reading Research Quarterly* 43, 165 – 185.
- Treiman, R. (1992). The role of intrasyllabic units in learning to read and spell in P.B. Gough, L.C. Ehri, & R. Treiman (eds), *Reading Acquisition* (665-106) Hillsdale, MJ: Lawrence Erlbaum.
- Wagner, R.; Torgesen, J.; Laughon, P.; Simmons, K. & Rashotter, C. (1993). Development of young readers phonological processing abilities. *Journal of Educational Psychology* 85, 83 – 103.
- Wagner, R. & Torgesen, J. (1987). The nature of phonological processing and its casual role in the acquisition of reading skills. *Psychological Bulletin* 101, 192 – 212.
- Walley, A.C.; Metsala, J.L. & Garlock, V.M. (2003). Spoken vocabulary growth: Its rule in the development of phoneme awareness and early reading ability. *Reading and Writing: An Interdisciplinary Journal* 16, 5 – 20.
- Whitehead, F., Cappey, A., Maddrin, W. (1977). *Children and their books: The final report of the schools council project on children's reading habits*. 10 – 16. Basingstoke: Evans / Methuen Educational.