

Effects of Rime-Based Analogy Instruction on English Word Recognition Ability of Ethiopian Children

Abiy Zewdu Agegnehu

Department of English Language and Literature, Hawassa University, Hawassa, Ethiopia

Mebratu Mulatu Bachore

Hawassa University, Hawassa, Ethiopia

Zelege Arficho Ayele

Hawassa University, Hawassa, Ethiopia

Abstract—Most children in Ethiopia, especially from economically disadvantaged families, often have no exposure to English before school and learn English in government-sponsored public schools with insufficient resources, semi-qualified or unqualified non-native teachers with poor teaching methods. Assessment results have shown that Ethiopian children's reading performance is below the standards set for each grade level and that they are poorly prepared for the next level of education. The present study aimed to determine whether a systematic and explicit rime-based analogy-phonics intervention could improve English word recognition ability in Ethiopian children. The participants were 3rd grade children (N=67) at two public primary schools in Hawassa, Ethiopia. A randomized pretest-intervention-posttest-control group research design was used, with half the children (N=33) randomly assigned to the experimental group and the other half (N=34) to the control group. The intervention was conducted for 40 minutes a day, 3 days a week for 12 weeks. Pre and posttests were used to measure the word recognition ability of the children and a t-test was employed to analyze the results. After controlling for the initial variables, posttest results showed that systematic and explicit rime-based analogy-phonics instruction led to significant improvements in children's word recognition ability. The study further indicated that such instruction could also be considered as a useful intervention tool to improve English reading performance of Ethiopian primary school children and contributed to the little-known literature on the subject.

Index Terms—EF word recognition, explicit rime-based instruction, analogy phonics intervention

I. INTRODUCTION

Word recognition is an ability to quickly and correctly decode printed words in the process of accessing meaning, and is therefore one of the basic skills required for effective comprehension (Choi & Zhang, 2021). According to Han (2015), "Researchers seem to agree that comprehension is not possible without accurate and rapid word recognition" (p. 58). When children read words accurately and fluently, they minimize the cognitive load associated with their reading process, thereby freeing up resources for understanding (Ehri, 2005; Share, 2004).

Word recognition is an area of discussion and debate, and there is much theoretical and empirical knowledge about how to recognize a word. Most of the debate has been between proponents of the whole-word recognition approach and those who support the part-to-whole word recognition approach. According to whole-word philosophy, a word can be recognized as a unit by memorizing its entire orthographic pattern (De Graaff et al., 2009; Holmes, 2009). The second approach assumes that a word can be recognized by identifying its functional components or sound units (i.e., phonemes, rime and syllable) and sequentially blending them into a word (Walton et al., 2001; Walton & Walton, 2002). Proponents of the whole-word approach believe that children can learn phonic elements implicitly in the words or texts they read. While proponents of part-to-whole approach argue that children should be exposed to instructions that explicitly and systematically teach them phonic elements such as letters-sounds association and ways of manipulating the sounds to form words (Christensen & Bowey, 2005; Connelly et al., 2001).

Teaching methods within the explicit phonics approach vary in the extent to which letter-sound combinations are used. There are two phonics methods identified by the National Reading Panel in this regard, namely Synthetic Phonics, which teaches word recognition focusing on small linguistic units, phonemes; and Analogy Phonics, which emphasizes the decoding of words on the basis of larger linguistic units within a word (i.e., rimes) (The National Reading Panel, NRP, 2000).

Analogy phonics is often referred to as rime-based or onset-rime instruction. An onset is the initial consonant or consonants that precede the vowel in a syllable. A rime is a sound unit found within a syllable and formed with a vowel

followed by a consonant(s) (White, 2005). Analogy phonics requires reading words by identifying word parts (i.e., rimes) and replacing word parts of known words with unfamiliar ones (Hines, 2009; Goswami, 1993; Savage et al., 2003). Unlike rhymes, which sound similar but do not necessarily look the same, rimes are consistent both orthographically (visually) and phonologically (aurally) (Hines, 2009).

According to Zigeler and Goswami (2005); Gaskins (2004) knowledge of rime units can be helpful for both novice and poor readers for the following reasons. First, rime makes English spelling consistent since it greatly minimizes the inconsistency of the associations of vowel letters with sounds. This argument is supported by evidence from analysis of English words. For example Stanbach (1992), analyzed the rime patterns of 17,602 words from the Carroll's et al. (1971), word list and found that all words can be grouped under 824 rime units. In their study of whether using rimes as a reading strategy facilitates the development of basic reading skills for beginning readers, Wylie and Durrell (1970) selected and analyzed 286 rimes from early grade texts and found that 272 of these rimes contain vowels with the same pronunciation. In addition, the authors reported that knowing just 37 of these dependable rimes is enough for beginning readers to read up to 500 of the most common words.

Rimes are simpler and more accessible sound units compared to phonemes or syllables. It is relatively easier to segment word parts into onset and rime than to break them down into their phonemic components, and decoding the rime at the beginning reduces the amount of processing required to blend individual sounds into words (Booth & Perfetti, 2002; Goswami & Mead, 1992; Savage & Carless, 2004; Walton et al., 2001).

Different educators and researchers assessed the effectiveness of rime-based analogy-phonics instruction in acquiring and developing basic reading skills, including word recognition ability (see Evens, 2013; Hines, 2009; Walton et al., 2001; White, 2005). However, to our knowledge, no study has been carried out in Ethiopia on this, and most of the empirical evidence also comes from situations where study participants spoke English as their first language. Furthermore, most intervention studies have been conducted in children with dyslexia, where the implementers were either the researchers themselves or reading specialists. Therefore, the main purpose of this study was to implement and evaluate the effectiveness of explicit and systematic rime-based analogy phonics instruction on the word recognition ability of EFL primary school children and the degree of applicability of such instruction by the regular classroom teacher in the normal school environment with normally developing students.

II. BACKGROUND OF THE RESEARCH CONTEXT

The 1994 Ethiopian Education and Training Policy, which emerged from the 1991 regime change, proposed expanding access to basic education for citizens and using the nationality languages as the language of instruction in primary school, with English being taught as a school subject from the first grade and its use as a language of instruction in secondary and higher education (MoE-ETP, 1994). Over the past 20 years, the government has implemented a series of five-year education sector development plans that uphold ET policy. As a result, Ethiopia is now seeing a remarkable improvement in primary school enrollment and is on track to achieve the goal of universal primary education (MoE, 2017). However, Ethiopian children, especially children from low socio-economic backgrounds and children from uneducated parents, face numerous problems in primary education. Today these children learn in substandard schools with unqualified and semi-qualified teachers using poor teaching methods (Kim et al., 2021; Beilewe, 2016; Hugh, 2007; Fekede & Hailu, 2018; MoE-ESDP, I-IV 2003-2015). Because of these and other related factors, several assessments have reported that Ethiopian children's reading performance falls below the standards set by the Ministry of Education for each grade level and they are poorly prepared for the next level of education where English is used as the language of instruction (USAID-AIR, 2012, 2016; NOE, 2000, 2004, 2008, 2016).

One nationwide study that revealed the poor reading performances of children in Ethiopia is the American Institute for Research's (AIR), National Early Grade Reading Assessment (EGRA). The result of the assessment disclosed that almost two-thirds of the children examined were failed to exhibit the necessary knowledge and skills for the minimum learning competencies specified in the curriculum for each grade level. The result further revealed that a significant number of 2nd and 3rd graders could not read a single word of English (USAID-AIR, 2012, 2016).

Scholars like Akamatsu (2005); Han (2015); Koda (2007); Odo (2021); Jazmin (2021), argue that the type of instruction children receive, their EF experiences, input and exposure they have, and the orthographic nature and depth of their mother tongue are among the factors affecting the effectiveness of word recognition in second or foreign language. Therefore, scholars recommend that effective ESL/EFL literacy instruction in the early grades should carefully consider these factors.

Recent research findings (see Almaz, 2015; Belilew, 2016), have indicated that most teachers in Ethiopia, particularly in public schools; tend to teach basic reading skills through memorization. They often begin by teaching the names of the letters rather than teaching the sound each letter represents. Teachers then encourage children to learn common words or phrases as a whole, store the words in their memories, and recognize them by sight. The teachers usually point to the words written on the board, which are then sung by the children. This method prevents children from reading unfamiliar words so they can only read words they are familiar with. In addition, the method can help children who benefit from nurturing conditions and support systems, including home reading, role models and encouragement from others, and rich oral and written communication experiences (Ehri, 2005; Ryder et al., 2007).

However, according to Fekede and Hailu (2018); Hugh et al. (2007), most children in Ethiopia, especially those studying in public schools, often have no contact with English before school since their parents most likely cannot speak, read and write English and they live in an environment where they have limited access to books and other written materials.

Ethiopian languages use two types of orthographic systems. Languages from the Semitic family (e.g. Amharic, Tigrigna, Hareri) use the Ge'ez alphabet, an alpha-syllabic script in which a single symbol called *fidel* regularly represents a syllable (CV unit). On the other hand, most languages of the Cushitic (e.g. Affann Oromo, Sidamuu Affoo) and Omotic (e.g. Woalitato, Kefii Noonoo) families use the phoneme-based Latin script (Yri, 2004; Piper & Van, 2016). In most Ethiopian languages, a letter/fiddle consistently corresponds to a specific sound in phoneme-based Latin scripts and to a syllable (CV unit) in the alpha-syllabic Ge'ez script. Because of this, Ethiopian children can read new words in their L1 using the word's phonological information (Piper & Van, 2016). But that is not the case in English. English has a deep spelling system where the correspondence between written and spoken units is not always consistent. To read a new English word, children rely more on the word's orthographic information than on its phonological information. This is because; the actual pronunciation of a particular word cannot simply be guessed from its spelling. Knowledge of letter names or/and letter-sound correspondences (i.e., GPC) in English alone provides only part of the key to decoding new words, and therefore children need more than just phoneme-level knowledge to read new words in English (Ellis et al., 2004; Ziegler & Goswami, 2005; Goswami, 1998; Goswami & Bryant, 1990).

The researchers of the present study therefore argue that Ethiopian EFL children should be explicitly exposed to instruction tailored to help them transfer their L1 word recognition skills and strategies to more easily decode new words in English, given literacy skills can be transferred between the first and second language (Snyder et al., 2017). One strategy might be to explicitly and systematically teach children to decode new words by making analogies with other words they already know based on common orthographic and phonological units (i.e., rimes) of known and new words.

Objectives of the Study

The main purpose of this study was to implement and investigate the effects of explicit and systematic rime-based analogy phonics instruction on English word recognition ability (i.e., word reading accuracy and fluency) of primary school children in Ethiopia. More specifically, the study considered the following specific objectives. It aimed to:

1. evaluate the effects of explicit and systematic rime based analogy phonics instruction on Ethiopian children's accuracy and fluency of reading instructed words.
2. assess the effects of explicit and systematic rime based analogy phonics instruction on Ethiopian children's accuracy and fluency of reading pseudowords from learned rime patterns.
3. examine the effects of explicit and systematic rime based analogy phonics instruction on Ethiopian children's accuracy and fluency of reading novel (non-instructed) words from learned rime pattern.

III. MATERIALS AND METHODS

A. Research Design

This study was an experimental study. The participating children were assigned to the experimental and control groups randomly. The experimental group was taught word study lessons through the rime-based analogy-phonics method, while the control group's word study lessons were conducted through the conventional method. The outcome of interest was measured twice, once before the intervention - pretest and once after the intervention - posttest.

B. Research Settings

The study was conducted at two public primary schools, Nigist Fura and Tabor Primary Schools in Hawassa, Ethiopia. The researchers chose this site because it is the region where the highest number of non-word readers (68%) was found in the 2010 National EGRA (Piper, 2010). The participating schools are typical Ethiopian public primary schools, where the children's mother tongue is used as the language of instruction and English is taught as a school subject from the first grade. Children in these schools have 5 English lessons per week of 40 minutes each with non-native English teachers.

C. Participants and Sampling Technique

The target populations of the study were 3rd grade children studying in the two public primary schools in the second semester of 2021 school year. The 3rd grade was deliberately chosen as the official word study lesson, starting with this grade in Ethiopia. All of the children in this study spoke their native language (i.e., Amharic or Sidaamu Afoo) at home. The parents of these children are mostly lower or lower-middle-class citizens who would not communicate with their children in English at home. In general, children were only exposed to English at school in English classes. There were 70 students, 44 boys and 26 girls, who took the pretest and started the intervention and only 42 boys and 25 girls completed the intervention, and their mean age was 10 years.

Due to COVID-19 protocols, each public school was allowed a maximum of 35 students per class. The researchers used this number as a benchmark to determine the sample size and set it at 70. A mixed sampling design was used to select participating schools and students. First, the participating schools were carefully selected to ensure that the

schools were comparable in terms of students' socio-economic background, school resources, teaching methods, and English teachers' qualifications and experience. In order to ensure this, data on the schools were first collected from the city administration's education department and later confirmed by observations and interviews with school heads. Finally, based on the data, two schools were selected, Nigist Fura and Tabor primary schools. These schools were comparable in terms of resources and teachers' profiles, and consisted of large numbers of children from families with low socioeconomic backgrounds.

Sample children were selected from each participating school using probability sampling techniques. Therefore, two sections of the 3rd grade were chosen at random; one from each school consisted of 35 children. In order to compare the word recognition ability of the children, a pretest was carried out before the intervention. An independent sample t-test was then calculated and the result confirmed that there were no statistically significant differences in English word recognition ability of the children in the two schools. Finally, the children were randomly assigned into experimental and control groups.

D. Intervention Lessons

The children in the control group were taught the actual word study lessons from the students' existing textbook, while the lessons for the experimental group were designed based on 200 monosyllabic word families containing 37 common rime units compiled by Wylie and Durrell (1970); *ack, ake, all, ale, an, ame, ain, ank, ap, ash, at, ate, aw, ay, eat, ell, est, ice, ick, ight, ill, ide, in, ine, ing, ip, ink, it, ock, op, oke, ore, ot, uck, ug, unk and ump*. The words were selected from the existing Grade 3 English textbooks. The words were frequency words with CVC, CCVC, CVCC, and CCVCC structures (e.g., *cat, clap, pink, and shock*). The three principles suggested by White (2005), for designing an effective analogy-based phonics lessons were adapted and used to design the lessons. The principles are:

1. Either prior to or in together with analogy teaching, there should be classroom activities aimed at teaching rhyme, initial phoneme identity and letter sound knowledge, particularly initial consonants, digraphs and blends.
2. Instructional activities should ensure that basic words, which represent common spelling patterns, are well learned or overlearned. It can also be helpful to post the base words in a prominent place in the classroom (e.g., on a "word wall").
3. Children need to see multiple examples of words with the same spelling pattern in a format that encourages them to notice all the letters in each word (p. 26).

Based on these principles, a total of 36 lessons of 40 minutes each were prepared and used to teach the experimental group children. Some activities were also adapted from Gaskins (1989), Benchmark Word Identification Program and used in the intervention. 9 of the lessons were prerequisite lessons aimed at teaching letter-sound correspondences, the way how to blend individual phonemes to read words, word-initial consonants including blends and digraphs, and rhyming and alliteration of words. The remaining 27 lessons were part of the main intervention lessons. The goal of these lessons was to help the children thoroughly learn the orthographic and phonological features of the rimes and keywords included in each lesson and use them as a basis to read new words by analogy. The rime units and keywords were placed on the word wall as they were introduced, fully analyzed and practiced in each session. The lessons were compiled into a manual and provided to the experimental group teacher to help her use it as a teacher's guide to conduct each lesson effectively. The manual contained detailed lesson plans prepared for each lesson, rime units and keywords, lesson objectives, a list of teaching aids, activity descriptions with time breakdown, and language and expressions used by the teacher.

E. Data Gathering Tools

Because there was no standard test in Ethiopia that aimed to measure children's EFL word recognition ability, three tests developed by the researchers were used to assess the children's fluency and accuracy in reading the given words both before and after the intervention program. In this study, word recognition refers to children's ability to read printed words accurately and fluently. Therefore, all tests were time tests and required the children to correctly read the given words within one minute. The reliability of the tests was checked by a test-retest reliability check before they were used to collect prospective data. The types and nature of each test are described below.

(a). Instructed Words Reading Test

The main purpose of this test was to measure children's ability to visually decode learned words presented in isolation. From the 200 keywords, 40 monosyllabic words with CVC, CCVC, CVCC and CCVCC structures were selected and used for this purpose.

(b). Pseudowords Reading Test

This test was designed to measure children's ability to phonologically decode isolated potential words without contextual clues. The words could only be read using phonemic information, knowledge of letter-sound and/or rime-sound correspondences. These words were 40 monosyllabic nonsense words with CVC, CCVC, CVCC, and CCVCC structures constructed using learned rime units and common English spelling patterns.

(c). Non-Instructed (Novel) Words Reading Test

This test provided a measure of children's ability to read isolated, novel words by analogy. The children were tested with words analogous to the keywords practiced during the intervention. The test contained 40 monosyllabic regular words with CVC, CCVC, CVCC and CCVCC structures.

F. Procedures of the Experiment

There were two participating teachers, one for the experimental group and the other for the control group, both of whom had English diplomas and were perusing their B.Ed. degrees in the summer in-service program. The average teaching experience of teachers in the experimental and control groups was 12 and 13 years, respectively. The experimental group children taught word study lessons through language-enriched explicit and systematic rime-based analogy-phonics method.

The intervention lasted 12 weeks, 40 minutes long, 3 days a week (Monday to Wednesday), with a total teaching time of 24 hours. The intervention was conducted by the Grade 3 classroom English teacher who was trained by the researcher prior to the intervention. The teacher was encouraged to conduct the training mainly in English and to use the children's native languages when the children could not understand the instructions and to explain why, how and when to use the strategies. During the intervention training, the researcher met with the teacher twice a week to review the children's progress, clarify learning outcomes, and collect the teacher's comments on the program.

Instruction was conducted using a competency-based approach. The teacher first demonstrates the activity, then conducts activities with the children, and finally lets the children do the activities themselves. Various multi-sensory activities (e.g. games, tongue twisters, songs) were used to model and practice the analogy strategy. At the beginning of each session, goals were set and rimes and keywords from the previous session were analyzed orally. Rimes and keywords of the session were introduced, their pronunciation modeled, and the words onset, rime, and vowel(s) identified to describe the word parts. Also, rhyming words with the keywords were generated and listed, keywords were selected and analyzed with a word analysis template, and spelling of words was practiced with the Elkonin box.

G. Reliability and Validity

The tests, training and teaching materials were made available to the research project supervisors, an educational psychologist, a primary school English teacher and two experienced EFL teachers from the university. They were informed about the purpose of the study and received background information about the study participants. All expert comments have been duly noted and taken into account to improve the tools and materials prior to conducting the study.

Inter-rater reliability was performed to check the consistency of assessors' ratings ($N = 2$). The data for checking the inter-rater reliability were generated during the assessors' training. First, the assessors were asked to observe and rate the responses of a colleague the researcher was testing. The researcher's and assessors' score sheets were then compared to see how closely they agreed in their assessment of the same observation. There were slight discrepancies among assessments, particularly on Assessor-1. Accordingly, discussions were held and appropriate feedback was given as to how the assessors' rating performance could be improved. Eventually, both assessors received new score sheets and were invited to individually score the researcher's responses while being tested by a peer. The scoring results were then used to calculate the agreement of the scores given by each assessor. The researcher then used Pearson's product-moment correlation coefficient to examine the extent to which the assessors' ratings correlate on the same observation and found a very strong correlation between the ratings ($r=0.98$).

H. Fidelity to the Intervention Program

Treatment adherence was assessed by observing randomly chosen sessions and employing an independent rater observing the sessions with the researcher. A total of 14 sessions were observed. Of these, 7 sessions were observed with an independent rater. Researchers-developed rubrics were used to monitor and assess sessions. Overall adherence to treatment averaged 92%, ranging from 85% to 98%.

I. Methods of Data Analysis

Scores for each test were calculated as the number of words the child read correctly per minute. The variables were: total number of words read, number of wrong words, time remaining on the stopwatch. These data points were used to determine the total number of correctly read words per minute. $CWPM = (\text{Total Words Read} - \text{Total Wrong Words}) / [(60 \text{ Time Remaining}) / 60]$. The test results were calculated by the researcher. The maximum score in each test was 40.

The results obtained were analyzed with the SPSS software package using parametric measurements. First, an independent-sample t-test was performed to examine whether there were statistically significant differences between the experimental and control groups both before and after the intervention on each of the study's specific objectives. Then the paired-sample t-test was used to measure the effects of the intervention (changes from pretest to posttest) on both the experimental and control groups. The effect size of the intervention was also calculated for all measurements using Cohen's d with pooled standard deviation. The criterion defined by Cohen (1988), $d \geq 0.2$ is a small effect, $d \geq 0.5$ is a medium effect and $d \geq 0.8$ is a large effect, was used to interpret the magnitude of the effect.

J. Ethical Issues

Informed consent to conduct this study was obtained from the city administration education department, and informed consent to participate was obtained from teachers, children, and their parents or guardians. On the day of the test, the children were informed about the purpose, type and procedure of the tests. The researcher, together with the school principal, confirmed to the children that the result of the test will not affect their school evaluation and will only be used confidentially for research purposes. They were also informed that if they did not want to take the test they had the absolute right not to take it and could even interrupt during the test. Finally, each child was given a personal identification code and asked to memorize this code and provide the assessor with their code upon request. All tests were conducted twice in one-to-one basis with instructions in Amharic or Sidamu Affoo, the children's spoken language. Both the pre- and posttests were carried out in two separate classrooms (one for each assessor) by university English instructors (N=2) who received hands-on training from the researcher in administering the tests.

All items in the tests were administered orally, and the children did not see the copy of the score sheet for the data. A sample item was given before each test to ensure the child understood what was expected of her/him. The child was then given an A4 sheet of paper (i.e., children's stimuli sheet) with words arranged five in a row and asked to read the words out loud in order as best s/he could. The assessor then started the stopwatch, marked incorrect words with a slash (/), placed a parenthesis () after the last word read, and noted the time remaining on the stopwatch. Each test was stopped after one minute and also before one minute if the child could not read a single word in the first row of the stimuli sheet. Finally, score sheets were collected after each test for further statistical analysis.

IV. FINDINGS AND DISCUSSIONS

A. Comparison of Children's Word Recognition Ability

This study followed a pretest-intervention-posttest-control group research design, measuring children's word recognition ability (i.e., word reading accuracy and fluency) before and after the intervention. First, sample children from the two schools were pretested before the start of the intervention to measure their word recognition ability and also to assess their comparability. The result of the independent-sample t-test showed that there was no statistically significant difference ($p > 0.05$) between the children in the two schools in terms of English word recognition ability. After the children in the experimental group were taught word study lessons through a systematic and explicit rime-based analogy method for 12 consecutive weeks, both groups received a posttest to examine whether there was a significant difference in their word recognition ability. An independent-sample t-test was again used to compare the groups' posttest results, and Cohen's d was calculated to determine the effect size of the intervention. The mean and standard deviation of the posttest results of the groups with their comparison values are given below.

TABLE 1
RESULTS OF THE INDEPENDENT SAMPLE T-TEST (POST-TEST)

Tests	Experimental Group N=33		Control Group N=34		t	Df	Sig.(2- tailed)
	Mean	SD	Mean	SD			
Instructed words reading	27.66	11.48	13.47	7.27	6.02	65	.000
Pseudowords reading	24.03	10.09	13.17	6.67	5.17	65	.000
Novel words reading	25.84	10.65	13.35	6.87	5.68	65	.000

As shown in Table 1 above, the mean values for the experimental group for all tests at the posttest were higher than those for the control group. The results of the independent-sample t-test showed that this difference was statistically significant at $p < 0.05$, indicating that the experimental group made greater progress than the control group in reading instructed words $t(65) = 6.02$, $p = 0.000$, pseudowords $t(65) = 5.17$, $p = 0.000$ and reading novel words, $t(65) = 5.68$, $p = 0.000$. Effect sizes were large for all tests that favored the experimental group; reading instructed words (1.47), reading pseudowords (1.33), and reading new words (1.43).

B. Within Group Comparisons of Improvement

The paired-sample t-test was used to compare the effect of the intervention in each group (experiment and control) and the results are presented in the tables below.

TABLE 2
RESULTS OF THE PAIRED SAMPLES T-TEST FOR THE EXPERIMENTAL GROUP

Tests	Pre-test		Post-test		t	Df	Sig. (2-tailed)
	Mean	SD	Mean	SD			
Instructed words reading	14.36	9.91	27.66	11.48	-13.78	32	.000
Pseudowords reading	12.54	6.73	24.03	10.09	-15.03	32	.000
Novel words reading	13.66	8.61	25.84	10.65	-16.36	32	.000

According to the result in Table 2, there was a significant difference in all tests, with the experimental group showing a significant improvement from pre- to posttest at $p < 0.05$, $t(32) = -13.79$, $p = 0.000$ for reading instructed words, $t(32) = -15.03$, $p = 0.000$ for reading pseudowords and $t(32) = -16.36$, $p = 0.000$ for reading novel words, respectively.

TABLE 3
RESULTS OF THE PAIRED SAMPLES T-TEST FOR THE CONTROL GROUP

Tests	Pre-test		Post-test		t	Df	Sig. (2-tailed)
	Mean	SD	Mean	SD			
Instructed words reading	13.05	7.30	13.47	7.27	-1.60	33	.119
Pseudowords reading	13.11	6.54	13.17	6.67	-.57	33	.571
Novel words reading	13.20	7.05	13.35	6.86	-1.30	32	.201

The result in Table 3 indicates that the change in the control group was not statistically significant for all tests at $p > 0.05$ level, $t(33) = -1.60$, $p = 0.11$ for reading of instructed words, $t(33) = -0.57$, $p = 0.57$ for reading pseudowords and $t(33) = -1.30$, $p = 0.20$ for reading new words, implying that the experimental group showed significantly higher scores and faster progress than the control group on all word recognition measurements.

C. Discussion

This study examined the efficacy of a systematic and explicit rime-based analogy intervention training embedded in word study lessons; conducted by a class room teacher on English word recognition ability in Ethiopian primary school children. The results of the intervention study produced three main findings.

First, after the word recognition ability of the children was controlled at the start of the intervention, the posttest result confirmed that the experimental group showed the greatest improvement in word recognition ability (i.e., word reading accuracy and fluency). The differences between the groups were significant and the effect size of the gains for the experimental group was large, leading us to conclude that there was an effect of the intervention on the experimental group's performance in reading instructed words, pseudowords, and novel words from learned rime patterns. It should be understood that in the control group, very little emphasis was placed on reading words, either by associating graphemes with individual phonemes and sequentially blending these phonemes into words (i.e., phonological decoding), or reading words by analyzing parts of the words (i.e., rimes) and replacing parts of known words with unfamiliar ones (i.e., reading by analogy). However, the emphasis was more on learning through the whole-word method, by copying and memorizing the entire orthographic patterns of the words. This suggests that the existing primary school reading instruction in Ethiopia, with its emphasis on exposing children to memorizing words and learning letter names, may not allow them to develop sufficient English word recognition ability, which is one of the basic skills required for the development of reading comprehension, since word reading ability and reading comprehension are closely related (Choi & Zhang, 2021). This is likely to result in children being ill-prepared for the next level of education, where they must use English as the language of instruction for learning other school subjects. Poor reading ability in the lower grades may also lead the children to underachievement, early dropout, and repetition in later grades (Hines, 2009; Ouellette & Beers, 2010).

Odo (2021); Jazmin (2021), argue that the type of instruction EFL children receive affects the speed and burden with which they acquire and develop English word recognition ability. Research findings have shown that (see Huo & Wang, 2017; Holtan, 2021; EdD & Savage, 2019; Burns, 2018; Irujo, 2007; Ehri, 2005; August et al., 2014; Dixon et al., 2011) phoneme-based methods are more effective than the whole-word method in developing children's EFL reading skills, including word recognition ability. Ehri (2005) further points out that phonics method shorten the time it takes children to become complete alphabetic readers. In the alphabetic phase, reading progress and associations in memory become morphographic (sequences of letters are quickly recognized as a unit). At this point, readers reach an automatism where the pronunciation of printed words can be instantly recalled with minimal decoding effort. Children who use the whole-word method rely more on context or visual cues when trying to recognize unfamiliar words.

Second, word study lessons conducted through a short, language-enriched and systematic analogy-phonics method with multi-sensory activities by the classroom teacher can be considered as a useful intervention for the development of English word recognition skills in EFL children in Ethiopia. Although the participants in this study underwent intervention for a relatively short period of time, children in the experimental group showed significant improvement in recognizing learned words by sight, in phonological decoding of pseudowords, and in reading new or uninstructed words by analogy. In contrast, the children in the control group experienced very little gain in recognition of learned words and almost none in decoding pseudowords and new words. It should be noted that the improvement was the result of the intervention, which lasted only 3 days a week for 12 weeks. The finding suggests that a systematic and explicit rime-based analogy-phonics intervention can also be used as a useful early reading intervention tool to improve the poor English reading achievements of Ethiopian primary school children.

Researchers have recommended that EFL children should be explicitly and systematically taught letter-sound and pattern (rime) sound correspondences and also how to apply this knowledge to read new words (Park & Jeong, 2005; Ng & Yiakoumetti, 2010; Zuriyatiaslina, et al., 2018). Further, in their L1 research findings (which could also be generalized to L2 settings) White (2005); Conrad and Levy (2011); Schnhal et al. (2012); Ouellette and Snchal (2008); Evans (2013), concluded that explicit and systematic rime-based instruction helps children to decode unfamiliar words using the phonemic and orthographic information of the word. Systematic instruction gives children the knowledge,

skills, and strategies needed to decode new words, and strategic instruction shows how the children can use these knowledge, skills, and strategies to independently decode unfamiliar words whenever they encounter them.

Third, an important implication of the present study is that rime-based analogy-phonics instruction can improve English word recognition ability in non-native children with transparent L1 orthographic backgrounds. Although there is a lack of research on this, the result of this study is consistent with the results of some other studies, such as Ng and Yiakoumetti (2010); Zuriyatiaslina et al. (2018). For example, Ng and Yiakoumetti found in their experiments that a systematic and explicit rime-based analogy-phonics intervention program resulted in significant improvements in word recognition ability of Hong Kong Chinese-speaking children. Similarly, Zuriyatiaslina et al. (2018) investigated whether or not the onset- rime instruction improves phoneme blending and word reading ability in Malaysian EFL learners and concluded that the use of the onset -rime instruction significantly improved students' ability to read new words.

V. CONCLUSIONS

The current intervention study provides evidence of the effectiveness of systematic and explicit rime-based analogy-phonics instruction on EFL children's word recognition ability and opens the door to such instruction as a potential intervention in Ethiopia, where English is becoming increasingly important but much support is lacking, to learn the language. We hope that future studies with a larger sample size, longer intervention periods, standard measures, and more effective interventions will provide a solid generalization of the effectiveness of systematic and explicit analogy-phonics instruction for the development of English word recognition ability in non-native children with a transparent L1 orthographic background who lack social and environmental support and exposure to English.

REFERENCES

- [1] Akamatsu, N. (2005). Effects of second language reading proficiency and first language orthography on second language word recognition. In V. Cook & B. Bassetti (Eds.), *Second language writing systems* (pp. 238-259). Clevedon, UK: Multilingual Matters.
- [2] Almaz, Debru. (2015). *Investigating the practice of teaching English reading and its challenges in First Cycle Primary Level*. PhD Dissertation: Addis Abeba University.
- [3] American Institutes for Research. (2012). *Teach English for Life Learning (TELL) Program: Ethiopia English Early Grade Reading Assessment (EGRA): Data Analytic Report*.
- [4] American Institutes for Research. (2016). *Early Grade Reading Assessment (EGRA) 2016 midterm report: USAID reading for Ethiopia's achievement developed monitoring and evaluation (READ M&E)*. Addis Ababa: USAID/Ethiopia.
- [5] August, D., McCardle, P., & Shanahan, T. (2014). Developing literacy in English language learners: Findings from a review of the experimental research. *School Psychology Review*, 43(4), 490–498.
- [6] Belilew, Molla. (2016). An Insight into the Practice of Teaching Early Reading in Ethiopian Primary Schools. *International Journal of Foreign Language Teaching & Research*, 4(15) 1-24.
- [7] Booth, R.J. & Perfetti, C. A. (2002). Onset and Rime Structure Influences Naming but Not Early Word Identification in Children and Adults. *Scientific Studies of Reading*, 6(1). Retrieved January 4, 2022 from https://doi.org/10.1207/S1532799XSSR0601_01.
- [8] Burns, M.K.(2018). The Relationship between Acquisition Rate for Words and Working Memory, Short-Term Memory, and Reading Skills: Aptitude-by-Treatment or Skill-by-Treatment Interaction? *Assessment for Effective Intervention*, 43(3) 182–192. Retrieved February 10, 2022 from <https://doi.org/10.1177/1534508417730822>.
- [9] Carrol, J.B, Davies, P., & Richman, B.1971. *Word Frequency Book*. Boston: Houghton Mifflin.
- [10] Choi, Y., & Zhang, D. (2021). The relative role of vocabulary and grammatical knowledge in L2 reading comprehension: A systematic review of literature. *International Review of Applied Linguistics in Language Teaching*, 59(1), 1–30. doi.org/10.1515/iral-2017-0033.
- [11] Christensen, C., & Bowey, J., (2005). The Efficacy of Orthographic Rime, Grapheme–Phoneme Correspondence, and Implicit Phonics Approaches to Teaching Decoding Skills. *Scientific Studies of Reading*, 9(4), 327-349. doi:10.1207/s1532799xssr0904_1.
- [12] Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillside, NJ: Lawrence Erlbaum Associates.
- [13] Conrad, N.J., & Levy, B. A. (2011). Training letter and orthographic pattern recognition in children with slow naming speed. *Reading and Writing*, 24, 91-115.
- [14] Connelly. V., Johnston, J., and Thompson. B, (2001). The effect of phonics instruction on the reading comprehension of beginning readers. *Reading and Writing*, 14(5), 423-457. Doi: 10.1023/A: 1011114724881.
- [15] De Graaff, S., Bosman, A. M. T., Hasselman, F., & Verhoeven, L. (2009). Benefits of systematic phonics instruction. *Scientific Studies of Reading*, 13, 318–333. Retrieved December 14, 2021 from <https://doi.org/10.1080/10888430903001308>.
- [16] Dixon, P., Schagen, I., and Seedhouse, P. (2011). The impact of an intervention on children's reading and spelling ability in low income schools in India. *School Effectiveness and School Improvement*, 22(4), 461–482. Retrieved March 2, 2022 from <https://doi.org/10.1080/09243453.2011.625125>.
- [17] EdD, S. Y, & Savage, R. (2019). Teaching Grapheme–Phoneme Correspondences Using a Direct Mapping Approach for At-Risk Second Language Learners: A Randomized Controlled Trial. *Journal of Learning Disabilities*, 1–14.
- [18] Ehri, L. C. (2005). Development of sight word reading: phases and findings. In M. J. Snowling & C. H. Hulme (Eds.), *The Science of Reading: A Handbook* (pp. 135-154). Malden, MA: Blackwell.

- [52] Ryder, J. F., Tunmer, W. E., & Greaney, K. T. (2007). Explicit instruction in phonemic awareness and phonemically based decoding skills as an intervention strategy for struggling readers in whole language classrooms. *Reading and Writing*, 21, 349-369.
- [53] Savage, R., Carless, S., & Stuart, M. (2003). The effects of rime- and phoneme-based teaching delivered by Learning Support Assistants. *Research in Reading*, 26(3), 211-233. Retrieved February 24, 2022 from <https://doi.org/10.1111/1467-9817.00199>.
- [54] Savage, R., & Carless, S., (2004). Predicting growth of nonword reading and letter-sound knowledge following rimeandphoneme-based teaching. *Research in Reading*, 27(3), 195-211. Retrieved February 6, 2022 from <https://doi.org/10.1111/j.1467-9817.2004.00227.x>.
- [55] S é n é ch é al, M., Ouellette, G. P., Pagan, S., & Lever, R. (2012). The role of invented spelling on learning to read in low-phoneme awareness kindergartners: a randomized- control- trial study. *Reading and Writing*, 25, 917-934.
- [56] Share, D. L., (2004). Orthographic learning at a glance: On the time course and developmental onset of self-teaching. *Experimental Child Psychology*, 87, 267-298. doi:10.1016/j.jecp.2004.01.001.
- [57] Snyder, E., Witmer, S. E., & Schmitt, H. (2017). *English language learners and reading instruction: A review of the literature*. Preventing School Failure Alternative Education for Children and Youth, 61(2), 136-145. Retrieved February 8, 2022 from <https://doi.org/10.1080/1045988x.2016.1219301>.
- [58] Stanbach, M. L. (1992). Syllable and rime patterns for teaching reading: Analysis of a frequency-based vocabulary of 17,602 words. *Annals of Dyslexia*, 42, 196-221.
- [59] Walton, P., & Walton, L. (2002). Beginning Reading by Teaching Rime Analogy: Effects on Phonological Skills, Letter-Sound Knowledge, Working Memory, and Word-Reading Strategies. *Scientific Studies of Reading*, 6, 79-115. Retrieved February 19, 2022 from https://doi.org/10.1207/S1532799XSSR0601_04.
- [60] Walton P D, Bowden M E, Kurtz S L, Angus M. (2001). Evaluation of a rime-based reading program with Shuswap and eltsuk First Nations pre-readers. *Reading and Writing*. 14(3-4):229-264.
- [61] Walton, P. D., Walton, L. M., & Felton, K. (2001). Teaching rime analogy or letter recoding reading strategies to pre-readers: Effects on pre-reading skills and word reading. *Journal of Educational Psychology*, 93(1), 160-180.
- [62] White, T. G. (2005). Effects of systematic and strategic analogy-based phonics on grade 2 students' word reading and reading comprehension. *Reading Research Quarterly*, 40(2), 234-255.
- [63] Wylie, R.E., & Durrell, D.D. (1970). Teaching vowels through phonograms. *Elementary English*, 47, 787-791.
- [64] Yri, K. M. (2004). Orthography and Phonology in Sidaamu Afoo (Sidamo). *Journal of Ethiopian Studies*, 37(1), 41-56.
- [65] Ziegler, J. C., & Goswami, U. (2005). Reading acquisition, developmental dyslexia, and skilled reading across languages: A psycholinguistic grain size theory. *Psychological Bulletin*, 131, 3-29.
- [66] Zuriyatiaslina Y, Jawanees AHN, Norhamimah R, Juliana MN, Ngo KL, Salihah A. Improving students' blending skill using onset- rime approach. *J. Fundam. Appl. Sci.*, 10(2S), 847-857.



Abiy Zewdu Agegnehu is a Lecturer in the Department of English Language and Literature at Hawassa University. He received his BEd degree in English from Dilla University and his MA degree in TEFL from Addis Ababa University. He is currently pursuing his PhD in ELT at Hawassa University. He taught English for many years at several public secondary schools, the College of Teacher Education and Hawassa University. His main research interests include early childhood education, early literacy development, ways and strategies to improve reading performance among poor and disabled readers. He has published his research in international journals such as the African Journal of Teacher Education, The International Journal of Research in Teacher Education and VDM academic publication.



Mebratu Mulatu Bachore (PhD) graduated from Addis Ababa University with B.A. in English Language and Literature, MA and PhD in TEFL. He is currently Associate Professor of TEFL at Hawassa University. Before joining Hawassa University, he taught English at the secondary school. He has been teaching various undergraduate and graduate courses and supervising masters and PhD candidates. He has more than 15 publications in reputable international journals.



Zeleke Arficho Ayele (PhD) received his B.Ed. Degree in English from Debub University and his MA and PhD in TEFL from Addis Ababa University. He taught English in high schools. He has taught English at Hawassa University for over a decade. He also served as Director for Academic Affairs Directorate at Hawassa University. He is currently Associate Professor of TEFL. He has published over 23 original research articles in reputable peer-reviewed journals. The scholar is a board member and reviewer for several journals. He is interested in quantitative research designs.