The influence of orthographic depth on early grade students' reading of words and non-words in Sidaama and English

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Abstract

The purpose of this study was to analyse word and non-word reading among early grade students of Sidaama and English, with a specific emphasis on the difference in orthographic depth between the two languages. The research has a convergent mixed methods design applying reading skills tests, interviews with teachers and classroom observations. The results of quantitative and qualitative analysis showed that student scores in Sidaama, which has a transparent orthography, indicated greater accuracy in both word and non-word reading compared to English with its deep orthography. Overall, students read words more correctly than non-words in both languages. Especially in English, the scores for non-words were very low. The results from the reading tests suggest that orthographic differences between the two languages caused challenges for the students when decoding words and non-words. The teachers confirmed the influence of these challenges in interviews, and students were observed struggling to read in class.

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Introduction

Reading skills development is critical and determines children's readiness to learn independently and facilitates learning in various subjects (Antoni & Heineck, 2012; DES, 2011; French, 2013). The situation in Ethiopia, however, has failed to show improvements despite research evidence since 2010 and persistent efforts to redress the problem (AIR, 2019). Ample evidence exists that shows the low reading ability of early grade children, and there is a growing concern among educators, but a strategy to redress the problem is not yet well developed (AIR, 2019; Abraha, 2024). This study investigated a possible explanation with regard to learning effectiveness: the contribution of orthographic depth in supporting or

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hindering the transfer of learning in reading ability development by examining Sidaama[2] and English as contextual cases.

In alphabetic languages, learning to read is dependent on students' understanding of connecting letters to sounds and putting them together for words. A large number of students acquire this knowledge in two or more languages simultaneously. In Sidaama region, students start learning to read in their mother tongue, Sidaama, and in English (a foreign language) simultaneously in grade 1. Sidaama and English have a similar base script, Latin, but are different in their orthographic qualities. Sidaama has 34 graphemes in total, whereas English consists of 26 graphemes. Twenty-six of the graphemes of the Sidaama alphabet correspond to the twenty-six letters of the English alphabet. However, all of the Sidaama vowels and some consonants are different in the way they are pronounced in English. Furthermore, Sidaama is alphabetic and the correspondence between the symbol and the phonemes is one-to-one, while English is not claimed to be phonemic since there is variation between grapheme and its phonemic counterparts. For example, the letter 'a' has different possible sounds in English while it always sounds like the /a/ in any Sidaama word. Students are thus vulnerable to transfer problems (from one language to the other) when learning to read (Anbessa, 2019; Yri, 2004).

Whether students are able to transfer decoding knowledge from one language to another, called cross-linguistic transfer, depends on the linguistic relation between the two languages and the consistency of the alphabetical principle within each language (Durgunoğlu, 2002; Melby-Lervåg & Lervåg, 2011). The reliability of print-to-speech correspondences, called *orthographic depth*, reveals a clear effect upon reading acquisition (Aro, 2004). A mismatch between the orthographies in the taught languages, the degree of obstruction, and inconsistencies in sound–symbol correspondence may complicate teaching and learning in early grade reading, which causes poor performance among children in early grades (Frost & Katz, 1992). When we observe the sound-symbol relationships between the two target languages, English is notorious for its association of multiple sounds with a single letter, described as having high orthographic complexity. In contrast, each letter in the Sidaama alphabet has an equivalent phoneme. Regardless of these differences, in both languages learning to read requires the knowledge that each letter (or group of letters) in a word can be associated with a particular sound. Students' graphophonemic awareness (Ehri & Soffer, 1999) and how they match graphemes to phonemes is thus a major foundational skill for reading words in both languages. In addition, graphophonemic awareness is an important predictor of further reading development (Harrison et al., 2016).

The current study offers several useful insights in this regard. In brief, the findings envisage improving teacher instruction, thus helping students when struggling with making the connection between the printed word and its oral counterpart. This difficulty of decoding words is believed to discourage children's persistence in the earliest stages of reading instruction, which may in turn lead them to abandon their attempts at learning to read.

[2] Sidaama is spoken by the Sidaama people in south-central Ethiopia. Anbessa (2000) and Kawachi (2007) refer to the language and the people as 'Sidaama'. The language is also called Sidaamu Afoo (literally: Sidaama's Mouth), and Sidamigna/Sidaminya (Amharic) (Kawachi, 2007). Based on recent literature, this article uses Sidaama to refer to the language and the people.

Furthermore, the recommendations of the study will help policymakers and teaching-learning material developers make informed decisions and interventions in the areas under discussion.

Statement of the Problem

In Ethiopia, it is widely observed that there are challenges related to the quality of learning. In this regard, the quality of early grade reading requires close attention. In the Sidaama region specifically, consecutive reports have confirmed decline across the years in learning outcomes in the early grades of Sidaama children (Piper, 2010; AIR 2016, 2019; RTI, 2015). An early grade reading assessment (EGRA) of grades 2 and 3 children from seven mother tongue languages in Ethiopia revealed that 34% of grade 2 students were unable to read even a single word, and specifically, 69.2% of Sidaama children were unable to identify a single sound or letter in words correctly (Piper, 2010).

Different factors can be mentioned as causes of the poor performance of children in early grades. Lack of effective teacher training, poor parental support for children's education in their reading, and problems related to the curriculum are some of the major factors (Ligembe, 2014; Piper, 2010; Solomon 2014). In addition, inconsistencies in sound-symbol correspondence, which hinder teaching and learning in early grade reading, lead to poor performance (Aro, 2004; Yri, 2004). Therefore, the current study aimed at examining students' reading of words and non-words in Sidaama and English in light of the difference in the orthographic depth between the two languages. We asked the following research question: How might orthographic depth influence grade 2 students' reading of words and non-words in Sidaama and English in two schools?

Theoretical Framework

Orthographic depth

This study builds on the theory of reading across languages which is mainly concerned with orthographic depth and how it affects students' reading processes (Barnitz, 1978; Katz & Frost, 1992). The characteristics of orthography and the features of reading are inherently linked. According to Schmalz and colleagues (2015), the concept of orthographic depth is twofold, dealing with both the complexity of correspondences between grapheme and phoneme ("print-to-speech") and the (un)predictability of these correspondences. Morphological and phonological transparencies are the two manifestations of the word 'depth' (Schmalz et al., 2015). In this study, we address the phonological aspects and the correspondence between sounds and letters in Sidaama and English and how these factors influence the reading of words and non-words.

In alphabetic orthographies, the degree of transfer between first language (L1) and second language (L2)/foreign language in students' reading can be associated with the complexity of letter and sound correspondence (Schmalz et al., 2015). Alphabetic orthographies may be classified as shallow/transparent or opaque/deep according to the transparency of their letter–sound correspondence. In a shallow, or transparent, orthography, there is a one-to-one correspondence between the phonemes and graphemes. Each letter represents one sound and vice versa. In opaque, or deep, orthographies, however, this relationship is complex and irregular. The same phonemes can be found with different

graphemes in words, and same graphemes can have multiple phonemes (Rey & Schiller, 2005). For instance, an 'a' in English is pronounced differently in the words 'father', 'cat' and 'call'. Frost et al. (1987) illustrated the difference between orthographies when comparing English and Serbo-Croatian. Serbo-Croatian has a shallow orthography where a consistent grapheme-phoneme correspondence occurs, in which the phonology of the word is directly represented in the orthography. In contrast, the grapheme-phoneme relation is complex in English by which the spelling system represents both the phonology and the morphology. Thus, the deep orthography of English presents a substantial challenge to many L2 learners because of its high degree of irregularity (Miller, 2019).

The challenge described by Frost et al. (1987) applies to Sidaama students. The 34 letters of the Sidaama alphabet have equivalent phonemes, and Sidaama vowels have only one sound each (e.g. the letter 'a' always sounds like the 'a' in 'father'). Sidaama has 28 consonant phonemes. In the language, gemination and vowel lengthening are phonemic (Anbessa, 2000; Kawachi, 2007). The maximum number of consonants that can occur successively in Sidaama is two, and these clusters appear inter-vocalically (Kawachi, 2007). Regarding vowels, Sidaama has a five-vowel system. These vowels may occur short (/i/, /e/, /a/, /o/, /u/) or long (/ii/, /ee/, /aa/, /oo/, /uu/) (Anbessa, 2000; Kawachi, 2007). Words in Sidaama end in vowels (Kawachi, 2007). In contrast, English has 26 letters but approximately 44 phonemes. Many English letters can correspond to more than one sound; for example, the letter 'c' can correspond to the sound/phoneme [k] as in 'cat' and also the sound/phoneme [s] as in 'certain'. On the other hand, many sounds can be represented by more than one letter/symbol. For example, the sound [k] can be represented by 'c', 'k', 'q' or 'ch'. Besides, English has many consonant digraphs, such as 'th', 'sh', 'ch', and 'ck', in which two graphemes are used to represent a single sound. These one-to-many and many-to-one relationships between graphemes and sounds in the orthography of English make decoding words especially difficult for learners whose first language has a shallower orthography and, thus, more regular one-to-one relationships, as in the case of Sidaama. The differences in the nature of the languages, combined with the fact that children learn to read in the two languages simultaneously, starting from grade 1, may also cause students to mix features from the two languages when reading words.

Word and non-word reading

When reading a word, a student may either sound out the word, letter by letter, or recognise the word through a more direct process, building on orthographic, phonological, and/or semantic knowledge (Coltheart, 2006). In alphabetic orthographies, efficient word reading arises from children's ability to decode printed words, that is, the ability to associate graphemes with their corresponding phonemes and to blend the sounds into accurate word pronunciations. Word and non-word (also referred to as 'pseudo word' or 'invented word') reading skills are indicators of fluent word-level reading (Caravolas, 2018) though they differ in their level of consistency. Non-word reading is often used when assessing students' decoding ability. They are word-like in their structures, but they have no meaning (Caravolas, 2018). Word reading, however, refers to fluent and accurate reading of words but may also include students' prediction of the word or sight word reading (Ehri, 2005). Based on this, to

examine the influence of orthographic depth in reading, the researchers measured student reading of both words and non-words in this study.

Methods

Research Design and Sampling

To answer the research question, a convergent mixed methods design was employed. The first part in the mixed methods process began with preparation and implementation of the reading skills tests. The second step was a qualitative phase aimed at developing more complete understanding of the situation from data gathered through classroom observations and interviews with teachers. The poor performance of the children in the early grades, especially among Sidaama children, drew the researchers' attention to Hawassa city since the language is used there. Two schools were selected based on a combination of convenience and purposive sampling (Etikan et al., 2016). The schools taught early grade reading. They were both Sidaama schools, and English was taught as a subject. Above 90% of the students were native speakers of Sidaama. In addition, the first author had been to the schools for related research work. So, it was found easy to build rapport with the school community and gather the necessary data without challenges, which helped us wisely use time and matters related to the logistics of fieldwork.

All the students selected for the reading tests had Sidaama as their first language. Both schools had four sections of grade 2, each with 45 students, 180 in total. Two sections from each school were randomly selected. From those sections, 15 students in the age group of 8-15 years were systematically selected with a fixed periodic interval. In the first school, the 90 students were given a number. We then chose a random number for the starting point. Our starting point was 1 with the sample interval of 6. Of the 15 students, 8 were female and 7 were male. A similar routine was followed at the second school, ending up with 7 female and 8 male students. These 15 male and 15 female grade 2 students took both the Sidaama and English reading tests.

In addition to the students, four teachers participated in the study, two from each school. They each had a minimum of 5 years of teaching experience. They were also native speakers of Sidaama. Two of them were Sidaama teachers, and the other two were English teachers. The English teachers had taught Sidaama in other schools in the same grade; they thus had experience in teaching both languages.

Four of these teachers' classrooms were selected for classroom observation to obtain a deeper understanding of our research question. The teachers were willing to let us videotape their lessons and to be interviewed. We treated the reading skills tests as our main data source, and classroom observations and teacher interviews as secondary data sources. Below, we provide an in-depth description of the three data collection tools: the reading skills tests, classroom observation and interviews.

Reading Skills Tests

The reading task for this study was administered based on the EGRA format recommended for measuring developmental indicators of reading ability (Piper, 2010; RTI,

2015). In each test, the students were tested on both Sidaama and English measures, prepared based on the objectives of the research and curriculum standards. A total of 60 test measures were administered. The two tests were similar with regard to structure and content, except for the differences caused by the nature of the two languages under investigation. For instance, gemination in Sidaama does not exist in English since it is a stress language. Vowel lengthening could be another example, which also exists in Sidaama, but seldom in modern English. In the word reading tasks, both the words and non-words thus differed because of the language difference.

In the reading tests, the students were asked to identify and read monosyllabic and bi-/multisyllabic words and non-words. Here, to familiarise the students with the task, they were asked to repeat each word/non-word they read. The students were given limited time for each task (in seconds) because the researchers wanted to gain knowledge both about the word the student was asked to read and about the student's possible mistakes and confusion in reading. The following section recounts the test measures of the word and non-word reading tasks in both languages.

Word Reading in Sidaama and English

To measure students' decoding and word recognition skills, unrelated word reading tests are important (AIR 2016). Two assessors (the first author and a research assistant with Sidaama as his first language) presented students with a sheet listing 40 unrelated words in English and Sidaama. The words were selected from the students' textbook and were the most regular ones in the textbook for second grade. In the word reading tasks, the assessors first read the word lists twice aloud in a clear voice. After that, they let the student do the task. The students were asked to spell the words and then read them in a specific order. The word list was mixed in order of difficulty.

Non-word Reading in Sidaama and English

The non-word reading test measured the decoding ability of the children. Primarily, it is useful to avoid sight recognition of words from past experience (Piper, 2010). In this task, the assessors presented students with a sheet listing 25 invented non-words, which was the same number as in the EGRA test. In the same way as in the word reading tasks, the assessor first read the word list twice aloud. After that, the assessors let the students do the task. The students were asked first to spell the non-words and then to read them in a specific order.

Classroom Observations

Classroom observations were carried out to see students' reading in a more authentic setting. We observed one class of English and one class of Sidaama in each school. Observations were arranged based on the schedule of the lessons. The observations were made for two weeks. One classroom observation was limited to one lesson. In the first school, the time allocated for one lesson was 35 minutes, and in the second school, the lesson lasted for 40 minutes. Schematically, the observation procedure can be shown as follows:

School 1	English	1 observation (35 min)	2 lessons
	Sidaama	1 observation (35min)	
School 2	English	1 observation (40 min)	2 lessons
	Sidaama	1 observation (40 min)	
		Sum	4 lessons

To allow appropriate observations of student and teacher classroom practices across the two languages, we used an observation checklist consisting of 16 questions (see Appendix I). The questions were not standardised, as the structure and content of the questions were prepared based on the specific interests of this study. The observation checklist was reviewed by language and curriculum and instruction experts to ensure appropriateness in data collection. Notes were taken following the checklist, which was prepared before the fieldwork. In addition, the classroom observations were videotaped. Videotaping was chosen in order to look carefully at the true situation to increase our understanding of student reading in both languages. The videotapes also gave us the opportunity to watch situations repeatedly when analysing the material.

Interviews

After the observations, the four teachers were interviewed. The intention of the interviews was to look at the practical and additional information from the teachers about the influence of orthographic depth on the students' reading of words and non-words in the two languages. The teachers were interviewed based on questions provided in an interview guide, which was forwarded to the teachers. The interview guide had two parts. The first part consisted of general information about the teacher's background, and the second part comprised questions that helped in understanding the research question of the study. The interviews were audiotaped (following consent from each teacher) to allow full engagement without worrying about taking notes. All interviews were held in convenient, quiet settings and were 25–30 minutes in length. They were carried out in Amharic since all the interviewed teachers and the interviewer communicated well in the language. As part of the analytic process, the interviews were later transcribed.

Quality Control

Both the qualitative and the quantitative data were cross-checked after all the data had been collected. For the reading tests, the data collectors checked the students' score sheets, whether each student's tests in English and Sidaama were parallel following their code and name written on the test sheets. The data collectors checked each examination paper at least twice, for instance, to check that the papers were not mixed without codes, and the data collectors prepared the data for entry. The data from the interviews and observations were checked to make sure that the data planned for collection had been collected. In addition, the video recordings of the observations and the audio recordings of the interviews were checked to make sure that the videos were viewable and the audio recordings were audible. Finally, for the quantitative data, the students' scores in each reading test were coded and entered into

a database. The qualitative data from the observations and interviews were filed in different folders by language and content, and were prepared for transcription and translation.

Data Analysis

The researchers collected and analysed the results of the quantitative data, then used the data from the classroom observations and interviews to support and explain the data obtained from the quantitative reading skills tests. For the quantitative data, the test results were listed under five categories. These tests were standard tests taken from the EGRA test (AIR 2016). However, structural and content-related revisions were made based on the specific interests of the study. In each test, one student was tested on both Sidaama and English measures at a time. In the first category, the assessor marked the results with a slash (/) if confusions between L1 and L2 were observed while students read the words. In parallel, the other data collector circled the word if students read it incorrectly. In the third category, if students read the words incorrectly, the assessor marked that as well. In the fourth category, the assessor wrote a text on the exam paper if students were able to identify the letters of the words but only read them in their native language. Sound omissions were also recorded where students omitted a sound while reading words. The assessor also marked if students read silent sounds aloud in their word readings. The assessor could stop the test if the student made four consecutive errors. The test result in such cases was listed under the 'cannot read' category in the test measurement. Afterwards, the collected data were cleaned, coded, and entered into Statistical Packages for Social Sciences (SPSS) software. Data analysis was performed using the same software (SPSS).

Qualitative analysis was also performed based on the information obtained from classroom observations and teacher interviews. The video recordings were first organised in different groups, i.e. depending on the school where the data were collected and the language of the lesson. Then, the data were transcribed following the arrangement made previously. The audio recordings from the teacher interviews, like the classroom observations, were first arranged following the type of lesson and the school. Then, the arranged data were transcribed depending on the source of the data. That is, the data for the English classes were categorised in one group, and the Sidaama data were categorised in another group.

Reliability and Validity

Reading tests, teacher interviews and classroom observations were employed to triangulate the data from the participants, strengthening the quality of the study and avoiding bias in the final results. The reading tests were tested for reliability to ensure the internal consistency of the measurements. We used the statistical software (SPSS version 25), and Cronbach alphas for Sidaama and English were found to be 0.78 and 0.82, respectively. This indicates that the tests were highly reliable and reliable, respectively, according to the literature (Cohen et al., 2007).

For validity purposes, observation protocols and interview guides were reviewed by two experts, one in language and another in curriculum and instruction, to ensure appropriateness for relevant data collection. This increased the possibility of valid interpretations based on the material (Creswell & Miller, 2000). To cross-check the

information across the two data collection instruments, the same teachers who participated in the observations were selected for individual interviews. The use of video made it possible to study the recordings repeatedly to ensure the validity of the analyses (Creswell & Miller, 2000). To make the observer effect as small as possible, the camera was placed in the back of the classrooms (Blikstad-Balas, 2017) to create a comfortable environment for the students and teachers. In addition, the placement was important to capture whole class interactions. We have tried to counter the observer's paradox (Labov, 1972) by not videotaping the test situation itself, however still trying to gather rich data from different sources and analyse them systematically, to insure the quality of the study.

Ethical Considerations

The schools' head teachers were informed regarding the purpose, objectives, and methods of the study. Moreover, both the students and the teachers were informed about the study and afterwards agreed to participate in it. In other words, informed consents were obtained before starting data collection in all cases.

Results

This section presents the results of the reading skills tests of words and non-words in Sidaama and English. The word reading tasks included 40 unrelated words, while the non-word reading tasks had 25 non-words. The descriptive results from the reading tests are supported by qualitative findings from teacher interviews and classroom observations to obtain a deeper understanding of how orthographic depth in the two languages may influence students' reading of words and non-words.

Sidaama Word Reading

Table 1 below presents a summary of the students' reading of words in Sidaama. Scores were recorded under eight categories: 'correctly read', 'incorrectly read, 'confusingly read with L2', 'correctly identified the letters but read with L2', 'sound omission', 'gemination reading error', 'vowel lengthening reading error', or 'cannot read'.

Table 1

Sidaama word reading

Sidaama Word	Correctly read (%)	Incorrectly read (%)	CIL but RWES* (%)	Confusing with Eng. (%)	Sound omission (%)	GEM_RE** (%)	VL_RE*** (%)	Can't read (%)
gusso	50	13.3	3.3	23.3	-	-	-	10
umo	73.3	-	3.3	13.3	-	-	-	10
Kai	76.7	3.3	3.3	3.3	-	3.3	-	10
qaaqqo	76.7	3.3	6.7	-	-	-	3.3	10
soodo	76.7	3.3	6.7	3.3	-	-	-	10
Ille	60	3.3	6.7	16.7	-	3.3	-	10
shota	60	3.3	6.7	3.3	16.7	-	-	10
mule	70	3.3	6.7	10	-	-	-	10
gansho	66.7	6.7	10	3.3	3.3	-	-	10

Sidaama Word	Correctly read (%)	Incorrectly read (%)	CIL but RWES* (%)	Confusing with Eng. (%)	Sound omission (%)	GEM_RE** (%)	VL_RE*** (%)	Can't read (%)
kaashsho	66.7	-	6.7	3.3	3.3	3.3	6.7	10
hocco	63.3	3.3	10	13.3	-	-	-	10
u'ma	76.7	3.3	6.7	3.3	-	-	-	10
ninke	80	3.3	6.7	-	-	-	-	10
aguri	76.7	3.3	10	-	-	-	-	10
hando	80		10	-	-	-	-	10
woga	70	6.7	6.7	6.7	-	-	-	10
Ane	80	-	6.7	3.3	-	-	-	10
Haameelo	73.3	6.7	6.7	3.3	-	-	-	10
abbi	80	3.3	6.7	-	-	-	-	10
meicho	70		6.7	10	3.3	-	-	10
duna	70	6.7	10	3.3	-	-	-	10
xure	70	3.3	6.7	10	-	-	-	10
quuphe	76.7	-	6.7	3.3	3.3	-	-	10
buko	80	3.3	6.7	-	-	-	-	10
Ula	80	-	6.7	3.3	-	-	-	10
dara	76.7	6.7	6.7	-	-	-	-	10
qoropho	76.7	3.3	6.7	-	3.3	-	-	10
qola	80	3.3	6.7	-	-	-	-	10
leelli	76.7	3.3	6.7	3.3	-	-	-	10
angha	80	3.3	6.7	-	-	-	-	10
kuula	76.7	3.3	6.7	3.3	-	-	-	10
seekka	73.3	-	6.7	10	-	-	-	10
goola	83.3	-	6.7	-	-	-	-	10
giira	83.3	-	6.7	-	-	-	-	10
ishine	83.3	-	6.7	-	-	-	-	10
raacha	73.3	3.3	6.7	6.7	-	-	-	10
Waa	80	-	6.7	3.3	-	-	-	10
keere	80	-	6.7	3.3	-	-	-	10

Note. *The child identified the letters correctly but read with English sounds, ** Gemination reading error, *** Vowel lengthening reading error

As indicated in Table 1, the frequency distribution for familiar word reading in Sidaama indicates that 50%–83% of the students identified words correctly. Most of the words (85%) were identified by 70% or more students, while 15% of the words were identified by 50%–69% of the students. Regarding the incorrectly read words, nearly half of the words were incorrectly read by the students; however, different scores were recorded under each word. The word read incorrectly most frequently was 'gusso', incorrectly read by 13.3% of the students. A few students (3.3%–10%) were able to correctly break the words down into individual sounds but were not able to decode and read them in Sidaamu, rather they read the words based on a sound in the foreign language, which is English.

The frequency distribution also illustrates that nearly half of the words were confusingly read by 3.3%–23.3% of the students. The word 'gusso' seemed to be the most difficult one, as 23.3% of the students were confused by it, followed by 'ille' (16.7%), 'umo' (13.3%), 'hocco' (13.3%), and 'mule', 'meicho', 'xure' (10%). Unlike the previous score (able to correctly break the words down into individual sounds in the target language but unable to decode and read the words in Sidaama), in this score the students confusingly read

the individual sounds as well as decoded the whole words in English. For example, students read the word 'gusso' like /dʒisso/, 'ille' as /ɛlle/, 'umo' as /jumo/, 'hocco' as /hotʃʿtʃʿo/, and 'xure' as /sorre/. Most of the words under this score started with letters that have different sounds in Sidaama and English.

Some of the students also made sound omission errors in a few (15%) words. Here, students made reading errors with words containing digraphs in initial, medial or final position. The word 'shota' was the one that most (16.6%) students made a sound omission error with. Here, the students read the word's initial digraph sound /sh/ separately as 's' and 'h', consequently reading the word as */hoota/~ soota*, which is not correct. This omission error was also observed in reading other digraphs too. Concerning the scores under the last two categories, only small numbers were recorded. Only one student committed gemination (3.2%) and two students' vowel lengthening (6.4%) errors, respectively, in this task type. A few (10%) students were unable to decode and read words in Sidaama at all and were recorded as 'cannot read'.

Sidaama Non-word Reading

Table 2 below describes the students' reading of Sidaama non-words. For these tasks, scores were recorded under six categories; these were 'correctly read', 'incorrectly read', 'confusingly read with L2', 'correctly identified the letters but read with L2', 'sound omission', and 'cannot read'.

The frequency distribution for non-word reading tasks in Sidaama shows that 60%-80% of the students correctly identified the non-words in the list. The result showed some decline in comparison to the results for word reading in the language. Thus, according to the frequency distribution, most (60%) of the students correctly read 70% or more of the non-words, while the rest of the students (40%) incorrectly read 50%-69% of the non-words used in the reading skills test.

Table 2

Sidaama non-word reading

Sidaama Non-word	Correctly read (%)	Incorrectly read (%)	CIL but RWES (%)*	Confusing with English (%)	Sound omission (%)	Can't read (%)
woka	60.0	6.7	6.7	13.3	-	13.3
dagi	70.0	10.0	6.7	-	-	13.3
aluma	73.3	6.7	6.7	-	-	13.3
xagu	60.0	10.0	6.7	3	-	13.3
moyo	66.7	13.3	6.7	-	-	13.3
shawi	63.3	3.3	6.7	3.3	10.0	13.3
fama	70.0	10.0	6.7	0	-	13.3
mutte	73.3	3.3	6.7	3.3	-	13.3
lesi	70.0	0	6.7	/10.0	-	13.3
mulina	66.7	13.3	6.7	0	-	13.3
naani	76.7	3.3	6.7	0	-	13.3
lexoo	66.7	6.7	6.7	2	-	13.3
oka	76.7	3.3	6.7	0	-	13.3
efi	63.3	0	6.7	16.7	-	13.3
mita	66.7	6.7	6.7	2	-	13.3

Sidaama Non-word	Correctly read (%)	Incorrectly read (%)	CIL but RWES (%)*	Confusing with English (%)	Sound omission (%)	Can't read (%)
musa	73.3	6.7	6.7	0	-	13.3
haawe	73.3	3.3	6.7	3.3	-	13.3
sidu	63.3	13.3	6.7	3.3	-	13.3
liji	73.3	3.3	6.7	3.3	-	13.3
olere	80.0	0	6.7	0	-	13.3
nala	70.0	6.7	6.7	3.3	-	13.3
ooni	76.7	3.3	6.7	0	-	13.3
fikulo	73.3	6.7	6.7	0	-	13.3
kola	76.7	3.3	6.7	0	-	13.3
lokki	24/80.0	0	6.7	0	-	13.3
						13.3

Note. * Correctly identified the letters but read with English sounds

Regarding the students' scores in the incorrectly read set, some (3.3%) of the students incorrectly read the non-words listed in the test. A small number (6.7% for each non-word in the list) of students correctly broke words into individual sounds but could not decode them in the first language and pronounced them with the sounds in the second language. The sound omission error was made by 10% of the students, and this error was observed for only one word starting with a digraph sound ('shawi').

In the confusingly read set, the frequency distribution shows that nearly half of the words were confusingly read with L2 by a small number of students. Here, non-words such as 'woka' (13.3%), 'efi' (16.7%), and 'lesi' (10%) were among the most frequently observed in this set. In all, 60% of the words were confusingly read by the participating students. The scores show a decrease compared to the confusion rate in the word reading task in Sidaama. In this set, non-words that the students were most often confused by were 'gax' (46.7%), 'kib' (20%), 'wix' (20%), 'tat' (13.3%) and 'dit' (13.3%). As in the previous tasks for word reading, most students were confused in reading letters that had a common grapheme but different pronunciation in L1 and L2.

When asked about the students' reading competence in the interviews, both teachers of Sidaama stressed that the low performance of students regarding letter identification could result in failure in developing higher level skills such as word reading, oral reading fluency, and comprehension skills. The teachers were asked if they thought student confusion in segmenting and reading words in Sidaama was due to the fact that English and Sidaama share the same alphabet. They were also asked in more detail if they could explain their classroom practices when such confusions occurred. To these questions, Teacher 1 responded (a translation from Amharic) as follows:

> Yes, there are only a few students that are good at reading words. While most are struggling, I think sometimes students face confusion while segmenting and decoding words, but it is very rare for Sidaama natives. Because, since they are native speakers of the language, if they are good at identifying the sounds in the words, they performed the task easier. However, this problem is observed in the non-natives. English is given as a subject in this grade level, and they have been taught the language since grade 1, so since L1 and L2 share common letters, students most of the

time mix the letters and the sounds between the languages they are taught. This creates confusion while they are reading words in the second language.

To the questions above, Teacher 2 from the other school reflected similarly. The quote below, a translation from Amharic, shows Teacher 2's opinion:

> For Sidaama native speakers, I think this is not a problem because, in the language, the letters and sounds have a consistent relationship. This means that any sound in Sidaama has the same sound across all words in the language, regardless of the position they occur in. But sometimes, while they [the students] are practising blending and segmentation tasks, the second language interference is observed. In this task, students who are performing the basic tasks, especially in the letter name identification task, performed better in phoneme segmentation and word reading tasks. But in general, while we see students' performance in this task at the targeted grade level, the struggling readers are higher in number than the good performers.

To conclude, for the interview question above, the two mother tongue teachers stressed that one problem causing students' confusion in segmenting and reading words in Sidaama was due to the fact that English and Sidaama share the same alphabet. However, they stated that if students are good at identifying the letters, they can easily read the words in the language.

In the classroom observations, the researchers observed word reading tasks were practised. The researchers observed that when students were asked by the teachers to read words individually, they struggled to decode the words correctly. Also, interferences between L1 and L2 were observed. In the same way as the other tasks discussed previously, the students replied to questions in chorus, which made it challenging to observe individual student's reading. Despite that, the researcher managed to capture signs of influence of orthographic depth in students' reading of words in the two languages. Some confusion was encountered, as we can see in the following student-teacher conversation. In the conversation, the teacher gave a chance to the student to read and requested others to listen to him. The student read:

> "Beettu kun**e**….kun**e**…." …."kun**i**"
> [The teacher interrupts him and revises the last word 'kun**e**' as "kun**i**". The student starts reading again.]
> "Beettu kuni heerannohu Sid**ee**mu."
> [Again the teacher interrupts the student and edits: "Sidaamu". Then the student took the correction and read the sentence correctly.]

As we can see, there was confusion in pronouncing some words. For example, for the word 'kuni', the student used the English letter 'e' instead of the Sidaama letter 'i'. Also in the word 'Sidaamu', the student pronounced 'a' like 'a' as an English letter, instead of Sidaama 'aa'. The interview responses of the interviewed teachers also revealed this fact. The teachers witnessed that there were letters that were too confusing for the students to read because the letters shared similar pronunciations in L1 and L2. The teachers said that the letters 'e' and 'i' were good examples in this regard. This means the letter 'i' in Sidaamu is pronounced like 'e' in English.

English Word Reading

Table 3 below presents the frequency distribution of the students' English (L2) word reading. For this task, students' scores were recorded under seven categories: 'correctly read', 'incorrectly read', 'confusingly read with L1, 'correctly identified the letters but read with L1', 'sound omission', 'silent sound pronunciation', and 'cannot read'. As compared to the subtests under the word/non-word reading tasks in Sidaama, these results show a decline and a much higher number of students who were confused because of their first language.

Table 3

English Word Reading

English Word	Correctly read (%)	Incorrectly read (%)	CILbut RWL1*(%)	Confusing with L1 (%)	Sound omission (%)	Silent sound pronunciation (%)	Can't read (%)
go	30.0	13.3	13.3	33.3	0	0	10.0
animal	20.0	13.3	16.7	40.0	0	0	10.0
find	20.0	20.0	23.3	26.7	0	0	10.0
up	16.7	13.3	13.3	60.0	0	0	10.0
come	30.0	10.0	16.7	16.7	0	0	10.0
help	30.0	26.7	13.3	20.0	0	0	10.0
two	53.3	20.0	16.7	0	0	0	10.0
run	26.7	20.0	16.7	26.7	0	0	10.0
see	50.0	10.0	16.7	13.3	0	0	10.0
down	50.0	10.0	16.7	13.3	0	0	10.0
red	56.7	13.3	16.7	3.3	0	0	10.0
and	23.3	6.7	16.7	43.3	0	0	10.0
play	40.0	13.3	20.0	16.7	0	0	10.0
big	33.3	20.0	16.7	20.0	0	0	10.0
you	33.3	23.3	16.7	16.7	0	0	10.0
chair	23.3	20.0	13.3	13.3	20.0	0	10.0
man	53.3	10.0	20.0	60.7	0	0	10.0
when	46.7	13.3	16.7	10.0	3.3	0	10.0
now	50.0	13.3	13.3	13.3	0	0	10.0
under	30.0	6.7	16.7	36.7	0	0	10.0
please	13.3	23.3	13.3	36.7	0	0	13.3
like	30.0	16.7	16.7	26.7	0	0	10.0
shoes	20.0	23.3	16.7	10.0	20.0	0	10.0
they	33.3	20.0	16.7	6.7	13.3	0	10.0
good	46.7	13.3	13.3	16.7	0	0	10.0
thank	33.3	20.0	16.7	10.0	6.7	0	10.0
going	26.7	20.0	13.3	26.7	0	0	10.0
love	30.0	10.0	20.0	26.7	0	0	10.0
know	20.0	10.0	16.7	0	0	140.0	10.0
him	46.7	10.0	16.7	13.3	0	0	10.0

Note. * Correctly identified the letters but read with Sidaama sounds

Accordingly, 13.3%-56% of the students were able to read words correctly in this English test. Only 15% of the words were identified by almost half of the students. The

students who read incorrectly numbered 6.7- 26.7%. This means, for example, that 6.7% of the students read the word 'under' incorrectly, while 26.7% read the word 'help' incorrectly. The percentages of students who incorrectly identified words were proportional. The same is true for the percentage of students who were able to identify letters in English but unable to read the words. The proportion here was 13.3%–23.3%.

Regarding the confusingly read set of words, this task type showed a considerable percentage of students who were confused, reading words influenced by Sidaama (L1). Compared to the ratio of students in the Sidaama word reading task type (3.3%– 60.7%), the scores were characterised by a higher proportion (0%–60%) of students identified in the confusingly read set. For example, 60% of the students were confused when reading the word 'up' as they read the word as [yup] /jup/. 'Always' was read as /ɔ:lweɪz/, 'clean' as /tʃ'ilan/, etc. Here, like in the same task type in Sidaama, most of these words started with letters with different pronunciations in Sidaama and English.

Concerning the students' performance in the sound omission set of words, Table 3 clearly shows that almost all the English words starting with digraphs were wrongly pronounced, with students committing sound omission in those words. The students read the digraphs as two separate sounds in the words. For example, the digraph sound 'th' was read as 't' and 'h' when reading words such as 'those' and 'thank'.

Some of the students also made sound omission errors with a few (15%) number of words when reading English words. Here, the students made the reading errors with diagraphs found word initially, medially, and finally. Regarding the students' reading errors related to words with silent letters, about 40% of students committed an error while reading the word 'know'. Here, the students pronounced the silent 'k' and read the word as *kinow.* In all, 10% of students could not decode and read words in English.

English Non-word Reading

As indicated in Table 4, regarding the non-word reading tasks in English, scores were recorded under five categories; these were 'correctly read', 'incorrectly read', 'confusingly read with L2', 'correctly identified the letters but read with L2' and 'cannot read'. They are almost the same as the categories in Sidaama non-word reading.

Table 4

English non-word reading

English Non-word	Correctly read (%)	Incorrectly read (%)	IlbutrwL* (%)	Confusing withL1 (%)	Can't read (%)
leb	46.7	26.7	13.3	0	13.3
lus	46.7	20.0	13.4	6.7	13.3
dit	53.3	6.7	13.3	13.3	13.3
fut	60	10.0	13.3	3.3	13.3
gax	13.3	13.4	13.5	46.7	13.3
huz	46.7	23.3	13.3	3.3	13.3
jod	60	6.7	13.3	6.7	13.3
kib	36.7	16.7	13.3	20.0	13.3

English Non-word	Correctly read (%)	Incorrectly read (%)	IlbutrwL* (%)	Confusing withL1 (%)	Can't read (%)
tob	46.7	23.3	13.3	3.3	13.3
mib	46.7	23.3	13.3	3.3	13.3
n	6	1	1	0	1
rop	56.7	16.7	13.3	0	13.3
hig	43.3	20.0	13.3	10.0	13.3
reg	50.0	16.7	13.3	6.7	13.3
s	5	1	1	6	1
tup	56.7	13.3	13.3	3.3	13.3
ral	60.0	10.0	13.3	3.3	13.3
wix	36.7	13.3	13.3	23.3	13.3
nep	50.0	16.7	13.3	6.7	13.3
nad	43.3	20.0	13.3	10.0	13.3
lut	66.7	6.7	13.3	0	13.3
yod	43.3	26.7	13.3	3.3	13.3
sim	46.7	16.7	13.3	10.0	13.3
t	5	2	1	1	1
s	4	2	1	6	1

Note. *Correctly identified the letters but read with Sidaama sounds

Regarding the frequency distribution, the results showed a decline even though the difference was small when compared to the word reading tasks in English. A few (4%) students read 50% of the English non-words. For the students' scores in each set, the highest proportion in the correctly read set was 66.7% for the non-word 'lut'. 'Gax' was read by the lowest (13.3%) percentage of the students. The frequency distribution also showed that nearly a quarter of the students read the non-words incorrectly, and the scores look proportional throughout the list. Almost 13.3% of the students were able to identify the non-words in English but read them with their first language sounds. Regarding the scores in the confusingly read set, 60% of words were confusingly read by the students. However, the scores show some decline compared with the confusion rate in the familiar word reading tasks in Sidaama. The non-words students were most confused by 'gax' (46.7%), 'kib' (20%), 'wix' (20%), and 'tat' and 'dit', both at 13.3%. As with the familiar word reading in Siddama, most students were confused in reading letters that had a common grapheme but different pronunciations in L1 and L2. The low cumulative frequency in both word and non-word reading tasks might deliver a clear picture of the difficulties in reading words in English.

The responses of the interviewed teachers support the results obtained from the reading tasks. Like the teachers of Sidaama, the two English teachers stressed that the low performance of students at the letter identification level could result in failure in higher level areas (such as word reading, oral reading fluency and comprehension skills). The teachers were asked if they thought student confusion was due to the shared alphabet. They were also asked in more detail if they could explain their classroom practices when such confusions occurred. To these questions, one of the teachers replied:

> Most of the students are struggling to segment and decode words. Sometimes it appears that they confuse the sounds with their mother tongue while segmenting and reading the letters. The confusion here comes from the use of similar letters in L1 and L2. However, in most cases they have been struggling to clearly identify the sounds of English in the words. For example, regardless of the variation in the English sounds, students used the same sounds with all the words while reading.

During classroom observations, word reading tasks were practised, and interferences between L1 and L2 were observed. Here, students sometimes used their knowledge of the first language while segmenting and decoding words. For example, when a student read the word 'cloud', s/he read the word as *tʃ'ilud*, and 'sunny' was read as *sinny*. It was also observed that students exhibited different kinds of confusion. For example, one student read the word 'cat' as *sat*, and the other read the other way, like *set.* Here, students just used the names of the letters in the alphabet while reading the sounds in the word. We also observed that some students were good at segmenting the letters, however, they struggled to decode correctly in English.

As in the Sidaama lessons, the students often answered in chorus in the English lessons. It was also observed that the better performing students received more attention from the teacher while the struggling readers were ignored. A consequence of this is that the teachers did not work with different students' specific problems in reading.

Discussion

This study examined how orthographic depth in Sidaama and English influences early grade students' reading of words and non-words. The results from the reading tests show that the differences in orthographic depth between the two languages caused challenges for the students when decoding words and non-words. The teachers confirmed these challenges in interviews, and struggling students were observed in the classrooms. Overall, the students read more correctly in Sidaama (L1) than in English, and they read words more correctly than non-words in both languages. Below we discuss the findings and point to some implications this study may have for reading skills instruction.

Looking across the results, they showed a clear effect of orthographic depth in both word and non-word reading. While most of the students (50%–83%) identified words correctly in the word reading in Sidaama, the frequency distribution showed a decline in the English word reading test, and a higher number of students were found to be confused when reading English because of their first language. The study revealed a similar result in the non-word reading tests of both languages. More students struggled to segment and decode non-words in English than in Sidaama, and 96% of them read less than 50% of the English non-words. In most cases, the students struggled to clearly identify the English sounds in the words. This was also noticeable in the classroom observations. Regardless of the variation in the English sounds, students used the same sounds with all words while reading. Both word and non-word reading tasks showed the students' difficulties in reading words in English, which may be seen in connection with the difference in orthographic depth in the two languages. This finding is in line with other research (Aro, 2004; Barnitz, 1978; Frost &

Katz, 1992; Schmalz et al., 2015) findings that languages with transparent orthographies have high accuracy scores for both word and non-word tasks in comparison to languages with deep orthographies.

As expected, non-words seemed more difficult to decode than words. This applied to both languages. Especially in English, however, the scores for non-words were low. The differences in the qualities of the two languages caused confusion among students learning to read words. As Schmalz et al. (2015) concluded, the one-to-many and many-to-one relationships between grapheme and phoneme – and the unpredictability of these correspondences in the orthography of English – make decoding words especially difficult for learners whose first language has a shallower orthography with a one-to-one relationship between the graphemes and phonemes. This is probably the reason the children read the non-words in Sidaama more easily; it is difficult to predict the sounds of graphemes in English since the correspondence is complex. Piper and Ginkel (2016) also suggested that there might be quite small differences between word- and non-word-recognition scores when the relationship between sound and symbol is consistent. These differences then would indicate the compatibility of the word reading strategies that children employ based on the specific language structures.

The data analysis also indicated that a few students struggled to read consonant clusters in the initial and final positions and to read words that have vowel length in both languages. This finding is supported by Read (1975), who remarked that some children failed to spell the nasals /n/ and /m/ when they occur before another consonant. In Sidaama, this happened when the nasal 'n' was followed by an obstruent; 'ha**nd**o'and 'a**ng**a' can be taken as examples. In the English test, we can take words such as 'do**wn'**, 'a**nd'**, '**und**er', and '**pl**ease' as examples.

In the Sidaama test measure, the additional letters were a challenge for the students to pronounce (e.g., 'gan**sh**o' – they omitted 'sh'), and almost all the English words starting with digraphs were wrongly pronounced by the students, who made sound omissions with those words ('**ch**air', '**sh**oes', '**th**ank'). This problem is associated with the children's failure in capturing the internal structure of words. This notion was also manifested in silent sounds. Here, 40% of the students committed an error while reading the word 'know'. The above discussion may support the notion that orthographic depth and reading are highly interrelated (Aro, 2004).

The interview and observation data reinforced our view that student confusion when reading was due to the fact that English and Sidaama share the same alphabet. The first language's role in students' reading development should thus not be underestimated. However, interviews and observations attested that, if students are good at identifying the letters in the language, they can easily read the words.

Conclusion and Recommendations

It is challenging to learn to read in two languages simultaneously, and this study has shown how the difference in orthographic depth between Sidaama and English made the decoding of words particularly challenging for early grade students. In the reading tests the study relied on, the transparent orthography of Sidaama allowed higher accuracy for both

word and non-word reading compared to English with its deep orthography. Overall, the children were more accurate when reading words/non-words in Sidaama than in English. In Sidaama, the majority of the students read most of the familiar words, and many succeeded in non-word reading. In English, the low cumulative frequency in both word and non-word reading tasks could show a clear picture of the difficulties in reading words in English. During classroom observations, it was observed that most of the students struggled to decode and read words in both languages, and the teachers participating in this study confirmed this.

As differences and inconsistencies between graphemes and phonemes may result in poor development of reading performance (Frost & Katz, 1992), it is important to take students' challenges seriously and discuss them with the aim of improving reading instruction. One of the study's consequences for instruction is the importance of working with students' graphophonemic awareness (Ehri & Soffer, 1999). Understanding students' graphophonemic awareness should thus be stressed in teacher education. In addition, the teacher should spend time on this topic when working with students. As most students learn to read in more than one language, the similarities and differences in the languages should be explicitly taught to students. Students' graphophonemic awareness also predicts further reading development (Harrison et al., 2016). A consequence of this is that teachers cannot ignore struggling students, as the classroom observations tended to show. If so, the poor development can become self-reinforcing. The interviews, however, showed that the teachers in this study were aware of these challenges, which is a prerequisite to a changing practice. How teachers may work and actually work with graphophonemic awareness in classrooms may thus be a topic for further research as well. To understand more fully orthographic depth's influence on students' literacy development in a broader context, it would also be interesting to study its impact on the phonological process and how differences in orthographic depth manifest in writing.

Limitation of the Study

This research showed important findings regarding the influence of orthographic depth in two languages (Sidaama and English) in students' reading of words and non-words in two primary schools. The findings are relevant to identify implications more than developing generalizations because of the sample size limitations.

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