Evidence for Phoneme Identity over Phoneme Manipulation Skill: Learning-to-Read in a Nonnative English Speaking Context

Abstract

The purpose of this study was to examine which of three instructional modalities was more effective in enhancing the ability of nonnative English speaking children to read during the first grade. In this study, sixty-three first-grade children were randomly selected from four first grade classes from two primary schools in a university town in a nonnative English-speaking country during the second term of the academic year. The group was randomly placed in groups of 21. The first two served as the experimental groups (identity, and blending/manipulation) and the third group served as the language experience (control). Both the identity and blending/manipulation groups were instructed using different instructional modalities. The third group was not exposed to any direct instruction. The results of the study indicate that after the eight weeks of instruction, the children in the identity group made modest gains in posttest scores over those in the blending/manipulation group on two of the measures—the test of phoneme cue reading (TPCR) and the test of vocabulary (PPVT). While the identity group made statistically significant gains over the blending/manipulation group, it was observed that the implicit associations between orthography and phonology that the subjects made that may have aided them to gradually construct an orthographic-phonologic to decode words. Educators of limited English proficiency learners need to adopt instructional modalities that allow for the interplay of models which can have more noticeable effects on the reading programs in the early elementary years.

(Tables--8; List of References—55; Instruments--3)

The Problem

Learning to read forms the basis of much of preliterate education, and as central as this is, much of what goes on in the early years of a child's exposure to the joys and thrills associated with reading is fraught with uncertainty. The problem is more daunting when we consider the teaching of reading in English to children who are nonnative English speakers. What dominant pedagogical practices or methodologies work best to opening the world of words to children seem to be the preoccupation of those vested with the education of the young. Beneath the instructional surface lie the different assumptions that inform what teachers of reading do or fail to do. The drill and practice on isolated sounds and letters which used to be the pedagogical practice were excised out years ago and have been replaced by other approaches that are sometimes no less tedious, painful, or tenuous, at best, for both teachers and pupils. What is the best way to teach children how to read? Opinion remains divided and contentious between the two primary approaches—phonics and whole-language. While phonics is based on the premise that relationships between the letters of writing and the sounds of speech are the means of acquiring literacy, whole-language emphasizes meaning.

Much of the previous research on the pedagogical constructs meant to aid the teaching of reading to children have concentrated on children in communities where English is the native language of the students or where English is the predominant language. In this study children from a nonnative English-speaking country were the subjects for advancing or rejecting the notion of which approach works best for achieving literacy. A feature of most developmental models suggests that beginning readers can only use spelling-to-sound knowledge as they have not established enough orthographic knowledge. It has been recognized that that, at the outset, children rely on their speech knowledge to establish a relationship between the spoken and written language. It is only later that they are able to process words through the established orthography (Sprenger-Charolles, 1997). The phonology of the native language of the children in this study appears to approximate that of English. In fact, the orthography of Akan is one of the most phonological as it reflects relatively faithfully the surface phonology of the language.

Clearly, whether it is the use of group-composed language approach, words-to-reading, whole sentence, or even phonics approaches, each aims at helping preliterate children to read. Words-to-letters approach has as its goal to ensure that children learn the sound correspondences for each letter. The same set of underlying assumptions about the nature of teaching, learning, and reading, underlie the phonics (whole-to-part) approach. If sight words and phonics knowledge were what children needed to learn in order to perform the translation process, then decomposing phonics into separable bits of knowledge (letter-to-sound, or sound-to-letter correspondences) could be presented, practiced and tested independently, thus the assumption for this study.

Review of the Literature

The last several years have seen the resurgence in studies on the types of pedagogies that could be considered the most effective in introducing reading to pre-reading children. Several studies on phoneme awareness that support the acquisition of

reading skills by preliterate children have been conducted to support the underlying assumptions about reading. Phonemes form the basic vocal gestures from which the spoken words of a language are constructed (I. Y. Liberman and Liberman, 1992). Awareness of phonemes, it is suggested, is critical to the learning of the alphabet because the orthographic symbols represent the sound sequences in pronunciation of words. For children new to reading, the elusive nature of alphabetic-sight-to-sound principle makes for the process of learning to read appear like an incomprehensible labyrinth. For instance, for a word like *light* the child has to sight-spell and construct a pronunciation that is initiated with /*l*/ represented by *l,* which is merged into the vowel /*ai*/ represented by *igh*, and completed with the consonant /*t*/ represented by *t*. The ability to make sense of the orthography-sound relationships of the alphabet to the direct representation of meaning to the recognition of the sequence of pronounceable word-sound relationship becomes a formidable task for preliterate children (Byrne, 1992; Wallach and Wallach, 1979). According to Ehri (1991), an awareness of the phonemic structure of words is central to making sense of the odd shapes and the arbitrary symbols they represent as spelling units in words. Those children who have very little phoneme awareness have the greatest difficulty in reading and spelling words, and are thereby handicapped in the gap between their achievement levels and those of their age group who are more aware phonemically. Stanovich (1986) has suggested that explicit instruction in phoneme awareness may help children to avoid reading delay and provide them with insight into the workings of the alphabet writing system.

The research point to the gains children can make when they are exposed to specific phoneme training or phoneme manipulation (Murray, 1998). Specific programs in phoneme awareness have concentrated on the manipulations of segmentation—the breaking down of words into discrete phonemes), and blending (a smoothing of ordered phoneme sequences to identify a spoken word (Ball and Blachman, 1991; Davidson and Jenkins, 1994; Fox and Routh, 1984; Hohn and Ehri, 1983; Lundberg, Frost, and Peterson, 1988; O'Connor, Jenkins, Leicester, and Slocum, 1993; O'Connor, Jenkins, and Slocum (1994). Further, Lewkowicz (1980) has pointed to the importance of segmentation ability in making children make sense of the spellings of the alphabet.

Other evidence points to the usefulness of phoneme identities as more important than phoneme manipulation in helping children develop the ability in gaining alphabetic insight (Byrne and Fielding, 1990). What the research suggests is that knowledge of particular phoneme identities is more useful knowledge than blending and segmentation skill. Still other evidence seems to point to the critical role that phonemic awareness plays in the development of the ability to decode and to read for meaning. According to the findings of the National Reading Panel, the overwhelming evidence suggests that teaching children to manipulate phonemes in words was highly effective under a variety of teaching conditions with a variety of learners across a range of grade and age levels and that teaching phonemic awareness improves their reading more than instruction that lacks any attention to PA" (7). Children who possess a high degree of phonemic awareness in kindergarten or early in the first grade are very likely to be good readers throughout their elementary school years. Most children who are successful readers at the end of the first grade do not exhibit a low level of mastery of phonemic awareness. On the other hand, a good proportion of unsuccessful end-of-grade-one readers appear to possess better than average phonemic awareness; this evidence is the critical piece for

establishing that phonemic awareness is necessary but not a sufficient condition for reading success (Pearson). The documented evidence point to the fact that while scholars are confident of the critical role of phonemic awareness in learning to read, they are less confident about the best way to enhance its development (Juel, 1988) and Adams (1990). Many researchers believe that the efficacy of phonemic awareness can only be achieved through direct instruction, but are also quick to admit that it is also likely that children develop this skill as a consequence of learning other approaches to reading, such as learning phonics, learning to write (Murray, 1998). Adams and Juel have independently concluded that children can learn and should learn the alphabetic cipher through a combination of explicit instruction in phonemic awareness and letter-sound correspondences, a deliberate insistence on invented spellings as the route to conventional spellings in writing activities, and lots of opportunity to read connected texts (when they contain enough decodable words to allow pupils to apply the phonics information they are learning through explicit instruction).

Contrary to the evidence, Smith, Christensen, Goodale, Ingebrand, and Steele (1993), Torneus (1984) conclude that segmentation and blending does not necessarily lead to children being phonemically aware. Scholes (1999) is of the opinion that "awareness of sub-syllabic segments of speech is not an untutored component of one's consciousness of speech, but, rather, a very limited consequence of alphabetic literacy." He further argues that the relationship made between written and spoken forms of English is misguided and that the view that writing is best comprehended by the conversion of graphic to phonic constructs is rather more injurious to gaining literacy skills.

One component of the phonics approach to literacy acquisition has been the assumption that beginning learners' awareness of speech as a discontinuous structure of utterance is critical to their ability is read. Some researchers suggest that training in blending and segmentation can enhance reading success, which means, teaching children to isolate and manipulate sub-syllabic segments of words. Still others researchers contend that phonemic awareness is a consequence, rather than a precursor, of the use of an alphabetic script. This "phonemic awareness" is held by some to be an untutored component of any speaker's consciousness of language and that variation in this consciousness contributes to success or failure in early reading.

From the foregoing, it appears that the case that phonological awareness is required for literacy is much stronger; however, the efficacy of blending and segmentation is rather unclear. Lenneberg (1962), and Campbell and Butterworth (1985) present cases of persons unable to speak from birth who attained quite high levels of literacy, and congenitally profoundly hearing impaired individuals who attained reading and writing skills. While reading skills of the deaf are typically rather poor, this is generally the result of inability to deal with morphological and syntactic structures of English rather than an inability to understand grapheme-phoneme correspondences (Scholes, Cohen and Brumfield, 1978; Russell, Quigley, and Power, 1976).

The purposes of the study reported here were (a) to determine which of two approaches to teaching reading—phoneme knowledge or blending and segmentation—was more effective in aiding pre-reading children decode words, and (b) whether or not phonemic awareness was a critical factor in the abilities of children learning to read, at least, in the context of the population for whom this question was studied.

Design and Methodology

Subjects

Sixty-three first-grade children were randomly selected from four first grade classrooms from two primary schools in a university town in Ghana during the second term of the academic year. At this point in the academic year, the students could be described as limited English proficiency learners. The group was further randomly placed in groups of 21. The first two groups served as the experimental groups, while the third group was the control. The researcher tested an initial group of 101 children on their alphabet knowledge, using five 12 x 8 inch laminated cards on which were the alphabet randomly written in 72 point size in Times New Roman fonts. A sample card read: "Show me P__; W___; Z____; A____; K____; F____." Ninety-two (92) had a mean score of 23.4. Of the final sample of 63, 32 (50.8%) were girls and 31 (49.2%) were boys. The average age of the sample was 6 years. The objective of screening the subjects with the Test of Alphabet Knowledge was to exclude from the sample subjects who scored below 20 correct responses after repeated trials.

Pretests

Pretests of subjects were conducted using three instruments. The Test of Phonetic Cue Reading (TPCR) is a twelve-item reading analog test constructed for use in an earlier study (Murray, 1998), similar to measures used by Byrne and Fielding-Barnsley (1990), which assesses ability to use initial consonants to distinguish words which differ only by the beginning phoneme. The test items differed only in their initial consonants. The subject was shown a card with a word **MAD** printed on it and asked, "Is this *sad* or *mad*?"

The subjects' inventory of verbal knowledge was assessed with the use of the Peabody Picture Vocabulary Test (PPVT) Form IIIA (Dunn & Dunn, 1997). The instrument was utilized to test subjects' listening comprehension for the spoken word in Standard English. Items included in the test were drawn from a pool of Standard English words that were depicted by an illustration and that represented 20 common content areas, such as animals, actions, and body parts. The subjects needed only to hear the word and then point to the one picture in four that best illustrated the meaning of that word.

The Test of Phonological Awareness (TOPA)(Torgenson & Bryant, 1994) was used to measure the subjects' explicit awareness of the phonological structure of words in English. "Phonological awareness is an oral language skill that serves as an important aid to understanding the relationships between written and spoken language." The kindergarten version was used in this instance.

Training Conditions

In a classroom setting, the researcher gave explicit instructions to two of the study groups, the phoneme identity group and the blending/manipulation group for three days a for 8 weeks, using strategies for identifying and sounding phonemes and blending of sound-letters, respectively. The third group received no direct instruction. For the duration of the study, each group assembled at different times in the day in the same classroom. Using the pre-test instruments, the phoneme identity group was exposed to 40 minutes of instruction in sounding three and letter words. In the first instance, the subjects were guided in the following manner after they had been given instructions and examples on what they were going to do: Listen carefully. We're going to play a repeating game. First, I'll say a sentence, then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's begin. (Pause). Say: We'll see the moon *s*oon. Now say /s/. Do you hear /s/ in moon or soon? Say: She caught a fi*sh* by the fin. Now say /sh/. Do you hear /sh/ in fish or fin? Say: That bug makes a bu*zz*. Now say /z/. Do you hear /z/ in bug or buzz? Say: We hid from him. Now say /*m*/. Do you hear /*m*/ in hid or him? Say: Those girls have the same name. Now say /n/. Do you hear /n/ in same or name? Say: I race to wash my face. Now say /f/. Do you hear /f/ in race or face? It was required of the subjects a correct approximation of the isolated phoneme. The blending segmentation group was also instructed by exposing the subjects to how to assemble an ordered phoneme sequence to identify a spoken word. The third group received no direct instruction.

Posttests

All the posttest measures were administered by third-year students of English oblivious to the intent of subjects' instructional assignments. To eliminate or minimize differences in the scoring procedures due to examiner differences, each examiner administered only one test for all the subjects.

Posttests to measure the subjects' mastery were conducted using three instruments. The Test of Phonetic Cue Reading (TPCR), a twelve-item reading analog test constructed for use in an earlier study (Murray, 1998) similar to measures used by Byrne and Fielding-Barnsley (1990), which assesses ability to use initial consonants to distinguish words which differ only by the beginning phoneme. The test items differed only in their initial consonants. The subjects were shown cards with words such as SAD printed on it and asked, "Is this *sad* or *mad*?"

The subjects' inventory of verbal knowledge was assessed with the use of the Peabody Picture Vocabulary Test (PPVT) Form IIIB (Dunn & Dunn, 1997). The instrument tested the subjects' listening comprehension for the spoken word in Standard English. Items included in the test were drawn from a pool of Standard English words that were depicted by an illustration and that represented 20 common content areas, such as animals, actions, and body parts. The subjects needed only to hear the word and then point to the one picture in four that best illustrated the meaning of that word.

The Test of Phonological Awareness (TOPA)(Torgenson & Bryant, 1994) was used to measure the subjects' explicit awareness of the phonological structure of words in English. "Phonological awareness is an oral language skill that serves as an important aid to understanding the relationships between written and spoken language" (ibid.). The Early Elementary Version was used for the posttest.

Results and Analysis of Data

The guiding questions for this study were (a) whether there were any significant interactions between instructional modalities in the three instructional conditions—phoneme knowledge, blending and segmentation, and generalized reading instruction; and (b) what were the effects (if any) of identity instruction over manipulation (blending and segmentation) instruction on subjects' ability to decode words. Table I shows the treatments by subjects (AxS), using analysis of variance on the Test of Phonemic Cue Reading (TPCR) pretest index of all three groups.

Table 1 Treatment by Subjects (AxS) ANOVA

Source	DF	SS	MS	F Prob.	> F
Subjects	20	165.75	55.30		
Within Subjects	2	411.33	9.79		
Treatments	2	110.60	55.30	7.36	0.002
Residual	40	300.73	7.52		
Total	62	577.08	9.31		

Note: In each of the following cases, the $p < 0.01$ is highly significant; $0.01 < p < 0.05$ is statistically significant; $0.05 < p < 0.1$ is tending to significance; $p > 0.1$ is not significant. On this test, the mean of all scores = 7.175 with standard deviation = 3.051.

A p-value of 0.002 shows a highly significant correlation of the indices at pretest in Table 1. The mean of all scores (7.18) and the standard deviation (3.05) are presented. The value of F is indicated at 7.52. The Test of Phonetic Cue Reading is a 12-item test, which presented a forced-choice between two alternative responses. The Test of Phonetic Cue Reading was administered at both pretest and posttest (before instruction and after), and the data analyzed using a 3 (Treatment Groups) X 2 (Time) ANOVA, considering the time element to be a repeated measurement of the three groups (Table 2).

Table 2 Treatment Means and Standard Deviations on Test of Phoneme Cure Reading

Variable	Means	Standard Deviations
TPCR (Pretest) Group 1	8.67	2.44
TPCR (Posttest) Group 1	8.86	1.74
TPCR (Pretest) Group 2	7.05	4.02
TPCR (Posttest) Group 2	7.91	2.07
TPCR (Pretest) Group 3	7.48	4.82
TPCR (Posttest) Group 3	7.05	4.02

Note: The ANOVA considered the time factor to be a repeated measurement of the three treatment groups.

The means and standard deviations are presented in Table 2. Since the TPCR was administered as both a pretest and a posttest, data for the entire battery were analyzed using a 3 (Group) X 2 (Time) analysis of variance (ANOVA). A comparison of the means and standard deviations for the pretest and posttests shows no significant gains for the identity group (1) or the language experience (control) group (3). The identity group obtained a mean score of 8.67 (pretest) and 8.86 (posttest), but the language experience

(control) group performed slightly better at pretest (7.48 compared with 7.05 posttest score). The blending/segmentation group accounted for the slight gains in the overall correlation. The blending/segmentation group showed significant improvement at the posttest over the pretest on the mean scores (7.05 pretest, 7.91 posttest).

Table 3 Treatments by Subjects (AxS) ANOVA Scores for the PPVT

Source	DF	SS	MS	F Prob.	> F
Subjects	20	647.64	65.42		
Within Subjects	105	1607.67	15.31		
Treatments	5	327.11	65.42	5.12	0.000
Residual	100	1280.56	12.81		
Total	125	2255.30	18.04		

Note: Note: Mean of all scores = 12.68 with standard deviation = 4.25.

Table 3 presents the results of treatments by subjects for the Peabody Picture Vocabulary Test (PPVT). The repeated measures of analysis of variance scores for the PPVT revealed a highly significant Group Time interaction (F = 5.11, p = 0.000), indicating differential phoneme manipulation between-groups performance. This suggests that subjects' ability to manipulate phonemes over the course of the study changed, depending on their instructional modalities.

Table 4 Pretest and Posttest Group Treatment Means and Standard Deviations on PPVT

Variable	Means	Standard Deviations
PPVT (Pretest) Group 1	10.14	3.38
PPVT (Posttest) Group 1	14.38	5.48
PPVT (Pretest) Group 2	10.76	3.02
PPVT (Posttest) Group 2	13.52	3.01
PPVT (Pretest) Group 3	13.62	4.93
PPVT (Posttest) Group 3	13.67	3.53

Note: Mean of all scores =12.68 with standard deviation = 4.25.

Table 4 presents the means and standard deviations of the pretests and the posttests for the PPVT, the means of all scores being 12.68 and a standard deviation of 4.25. An examination of the means shows the greatest gains among the identity (Group 1) and blending/segmentation (Group 2) subjects. The language (control) group showed a significant difference among the three groups in the initial vocabulary skills but had negligible improvement at the posttest.

Table 5 Pretest Treatments by Subjects (AxS) ANOVA on TOPA

Source	DF	SS	MS	F Prob.	> F
Subjects	20	288.38	58.43		
Within Subjects	42	1287.33	9.79		
Treatments	2	116.86	58.43	2.00	0.15
Residual	40	1170.48	7.52		

Total	62	1575.71	25.42

Note: Mean of all scores = 9.14 with standard deviation = 5.04.

Table 5 presents the within-subjects treatment scores. The mean of all scores was 9.14 with standard deviation of 5.04. The instructional groups did not differ significantly at pretest or posttest on the TOPA measures, F = 2.00, p = 0.15.

Table 6 Pretest Means and Standard Deviations for TOPA

Variable	Mean	Standard Deviation
TOPA (Pretest) Group 1	10.95	6.52
TOPA (Pretest) Group 2	8.81	3.04
TOPA (Pretest) Group 3	7.67	4.61

Table 7 Posttest Means and Standard Deviations for TOPA

Variable	Mean	Standard Deviation
TOPA (Posttest) Group 1	12.24	7.15
TOPA (Pretest) Group 2	11.44	3.63
TOPA (Posttest) Group 3	8.21	5.06

Tables 6 and 7 present pretest and posttest means and standard deviations for TOPA of all groups. At posttest, significant differences were observed between groups. The means of all scores for the entire sample was 10.19, with standard deviation of 5.34. Given the fact that vocabulary development and phonological awareness are usually related, it is noteworthy to consider the effect of the training sessions on the study subjects. The control group (Group 3) had no phoneme awareness instruction during the period of the study and, as was expected, did not perform well on the test of phonological awareness.

Table 8 Means and Standard Deviations by Instructional Group on Phoneme Identity Measures

	Identity		Blending/Segmentation		Language	
Test	M	SD	M	SD	M	SD
Pretest (TOPA Sound-Word Matching)						
Initial Sound-Same	5.19	2.06	5.05	2.44	5.81	3.22
Initial Sound-Different	6.25	1.76	5.19	2.06	5.86	3.28
Posttest (TOPA Sound-Word Matching)						
Final Sound-Same	6.33	1.62	5.76	1.70	5.91	3.75
Final Sound-Different	6.43	1.72	6.52	1.37	5.62	3.99

Note: Maximum number of items on each test is 20, with 10 items targeting final phoneme (sound)-same and 10 items targeting final phoneme (sound) different.

Table 8 reports the pretest means and standard deviations on the subjects' ability to choose from three response choices to match initial sound-same words with stimulus words (aided by pictures in each case), and then to choose from three response choices to match initial sound-different words with stimulus words. At posttest, final sound-same

and final sound-different phonemes were tested. The mean of all identity scores was 6.05, with standard deviation of 1.84. Blending and segmentation yielded means of all scores as 5.63 and a standard deviation of 1.99, while the language group yielded means of all scores as 5.80 and a standard deviation of 3.51. A comparison of pretest-posttest means shows only modest gains by the phoneme identity group, while the blending/segmentation group made more significant gains. The language experience group improved only marginally at the post initial sound-same, but not so well at the posttest final sound-different.

Discussion

The present study was designed to determine to what extent insight into alphabetic knowledge depended on an awareness of particular phoneme identities or on the skill in manipulating phonemes (blending and segmentation). The results of this study suggest that an integration of the two divergent concepts of phoneme training—identity and blending and segmentation—could better serve the population under discussion.

The scores from the Test of Phoneme Cue Reading (TPCR) provide evidence that an awareness of particular phoneme identities was far more helpful in improving children's ability to decode words, albeit imperfectly, than blending and segmentation. It seemed that blending and segmentation distorted the target words in the subjects' minds, and their ability to sound them was not improved. The ability to manipulate phonemes may be independent of the knowledge of phoneme identities. Compared with the blending and segmentation (manipulations) group, the Identity group seemed to have performed better on all the indices. The scores of the TPCR tend lend support to the conclusion that phoneme identity instruction may enhance early application of grapheme-phoneme correspondences, especially in the subjects' ability to use initial letters to signal phonemes. However, it may also be noted that letter-phoneme (sound) knowledge did not appear to have had any noticeable effect on the children's ability to decode words. In some instances, the children were able to recognize the phoneme approximations of letters but were unable to put them together to decode words.

From the foregoing, it is clear that the subjects acquired differential knowledge of phonemes identities or manipulations. The obvious differences that appear in the pretest and posttest scores of the control group (language) were to be expected, given the fact that no direct instruction was given to them. A noticeable effect of instruction on the identity and segmentation/manipulation groups suggests that the instructional modalities were effective in producing the appropriate responses to exercises at posttest.

The subjects, however, seemed to have had difficulties properly blending words, though they were generally aware of the phonemic contrasts of sound-letters. These results might be explained by the fact that the use of phonological mediation, facilitated by phonological awareness, permits the reading of known and unknown regular words. Through the use of mediation and the comparison between their decoding outcomes on words that are part of their oral vocabulary, children can deduce grapheme-phoneme correspondences. It is reasonable to theorize that children learn most of the relationships between orthography and phonology through the kind of mediation that is suggested by this study. Implicit associations between orthography and phonology enable children to

gradually construct an orthographic-phonologic construct that aids them in their ability to read.

One of the difficulties of arriving at a definitive conclusion about this study is the inherent problem nonnative English children encounter when trying to speak a language they are learning only through its written form. Even though it is reported that Ghana's education department has mandated introducing children to English as early as kindergarten, much of the sights and sounds of the children's community is carried out in the local language, which mitigates the gains they make at school. In spite of this, it has been established that reading depends on phonological processing. Therefore, the foregoing appears to suggest that learners of a new language may have to rely heavily on grapheme-phoneme correspondences of their own language, and if these correspondences approximate those of the second language they are learning to read, they will learn to read more correctly and set up correct oral lexicon. Children in this study seemed to rely heavily on the phonology of their language to arrive at the sound-systems of English words.

Our understanding of phoneme awareness seems to suggest it, more than any other skill, has a more direct influence in contributing to preliterate children's ability to read. Examining the data of this study, we find that phoneme identity knowledge and blending/segmentation are both implicated in helping children to learn to read. It may be reasonable, therefore, to assume that some children in one group could have benefited from exposure to one instructional modality or vice-versa. Overall, knowledge of phonemes was more directly attributable to the subjects' ability to identify and make use of correspondences, because the ability to manipulate phonemes presupposes an identification of the phonemic structure of the sound in question.

Ghana is primarily a non-Native English speaking country, where instruction in schools is carried out in English. My thinking is that if the results this study support the theoretical basis for introducing phoneme knowledge as a manipulative skill, then it will help establish a foundation for redirecting how children in such non-Native English settings are taught reading.

It may be instructive for teachers of the students in this sample to explore the instructional techniques associated with this study and employ them to lead children to learn to read. As has been hinted elsewhere, a strong phonological link seems to exist between the phonology of English and the children's first language (L1). Though the focus of the present study was about how the students' L1 contributes or hinders their ability to acquire skills for reading English, it may be something to consider in a future study. Any such exploration would be to the children's advantage.

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