

Davis, S. *Metaphonological Ability in Low-literate Adult Somali English Language Learners* (2009)

This is a study of metaphonological ability in low-literate adult Somali English Language Learners (ELLs). It asks the questions: To what extent are non-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task? Studies with low-literate adult ELLs by Elaine Tarone and Martha Bigelow, as well as studies produced by the Low-Educated Second Language and Literacy Acquisition [LESLLA] forum were the biggest influences on this study. The study is a quantitative, one-shot design, involving six female low-literate adult Somali students from an adult ESL program in Minnesota. The only identifiable factor affecting their performance on the metaphonological ability testing was the amount of schooling they received in childhood.

ACKNOWLEDGMENTS

I would like to thank my committee members for their time, their careful, thoughtful editing and suggestions, and their encouragement. They are brilliant and I am so very grateful for them. I would also like to thank the teachers and staff at the school where the research was performed. They were very open to me and to this research, and also very flexible and willing to give of their time. I would like to thank my interpreters for their time, their expertise, and their valuable insight. Finally, I would like to thank my participants for being willing to give of their time, performing language tasks that were very new and unusual to them, for the sake of improving language instruction for future language learners.

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CHAPTER ONE: INTRODUCTION

I once tried to learn the Nuer language informally, with only the help of native Nuer speakers. I was a refugee caseworker and many of my clients were from the Nuer tribe of Southern Sudan. At nearly every appointment, I attempted to scribble down a phonetic transcription of the words I learned. If I wrote them down, I remembered them, or was at least able to look back at the words later and eventually make a visual impression of them in my mind. My clients were learning English, but my Sudanese clients in particular had absolutely no alphabetic print literacy skills. Every word of English and every bit of English grammatical structure they learned was achieved entirely through listening and speaking. Many of them were also learning English and English literacy in ESL classes, but in general they did not take notes or try to scribble down new words. Yet they learned. Many of them became conversant in English within months of arrival. And many of them had already learned two or three languages before arriving in the U.S. All without formal schooling.

I continue to be baffled by this language acquisition process—one without literacy as a tool—that completely eludes me. I am almost entirely incapable of learning and remembering foreign language words without writing down something that represents the sounds of the word. And most of my fellow literate adults share this same inability.

Adult learners who have little or no alphabetic print literacy skills are in adult ESL classrooms throughout the United States. In 2003, it was estimated that five percent of adults in the U.S. were non-literate (NCES, 2003), and there are an estimated 771 million adults without basic literacy skills in the world (UNESCO, 2006). Many of the refugees entering the U.S. yearly are members of this statistic. For years, crises all over the world have interrupted the formal schooling of millions of young people, many of whom are now resettled refugees in the U.S. The United States admitted 60,192 refugees in 2008. The projected total of refugee arrivals for 2009 is 75,000 and the proposed ceiling for refugee admissions into the United States for 2010 is 80,000 (U.S. Dept of State, 2009).

By virtue of being from war-torn areas, a great number of these refugees were not afforded the opportunity to attend school in childhood or later, and are subsequently without native language literacy. They are in ESL classrooms around the country and they must learn English as quickly as possible in order to become employed. While it is clear that non-literate people are capable of learning a second language, we do not know if their language acquisition process differs in significant ways from literate learners, as the field of SLA research has thus far largely ignored the study of these language learners (Bigelow & Tarone, 2004; Bigelow, Delmas, Hansen & Tarone, 2006; Tarone, Swierzbina & Bigelow, 2006). Very recently a small body of research with non-literate adult language learners is emerging (Bigelow, Delmas, Hansen & Tarone, 2006; Kurvers, Vallen, & van Hout, 2006; Young-Scholten & Strom, 2006; Trupke, 2007) but a great deal more is necessary. If we can understand the language acquisition strengths,

weaknesses, and needs of non-literate language learners, we can then provide the most suitable teaching methods for them in order to provide the greatest access to language and independence as quickly as possible.

Research into the differences between literate and non-literate adults tends to focus on the deficits of lacking literacy. However, given that non-literate adult ELLs acquire multiple languages without literacy skills, they may actually have memorization tools that are unavailable to literate learners (Bigelow & Tarone, 2004). They must develop their own strategies to compensate for the knowledge and skills they lack. For example, concerning numbers and amounts, non-literate adults must memorize a quantity itself rather than its written representation (Castro-Caldas, Reis & Guerreiro, 1997). Also, they may experience specific benefits in their language acquisition process due to their lack of literacy. It may be argued that if non-literate adults do not consciously notice or analyze L2 language features, they avoid over-analysis, which may seriously hinder second language acquisition (Krashen, 1981). More research with non-literate adults in the field of SLA may more clearly reveal these and other undiscovered strengths for language acquisition.

One area of language acquisition that has been given some attention in second language studies with non-literate adults is the area of phonemic awareness and metaphonological abilities (Young-Scholten & Strom, 2006; Trupke, 2007). This subject has been explored a fair amount in native language studies with non-literate adults (Morais, Cary, Alegria & Bertelson, 1979; Read, Zhang, Nie & Ding, 1986; Adrian, Alegria, & Morais, 1995; Lukatela, Carell, Shankweiler, & Liberman, 1995; Loureiro,

Braga, Souza, Filho, Queiroz, & Dellatolas, 2004; Durgunoğlu & Öney, 2002) and in native language studies with children (Olson, 2002; also many are cited in Morais, et al., 1979; in Kurvers, et al., 2006; and in Young-Scholten & Strom, 2006), thus it has been of interest if non-literate adult language learners will display similar results to these two groups.

Another reason phonemic awareness has received some attention in these studies is the question of how phonemic awareness affects the development of literacy in adults. Native language studies with adults have revealed that alphabetic print literacy and phonemic awareness seem to have a reciprocal relationship (Morais, et al., 1979; Read, et al., 1986; Durgunoğlu & Öney, 2002). That is, each is dependent upon and enhances the other. The question that is still being explored is, which comes first for non-literate adult second language learners? Phonological awareness has been found to be a predictor of decoding ability (Durgunoğlu & Öney, 2002), but developing phonemic awareness has been found to require specific training in alphabetic literacy (Morais, et al., 1979; Read, et al., 1986; Adrian, et al., 1995). Further research is necessary in the field of SLA to firmly establish how and when it is best to focus on each skill for non-literate adult second language learners.

The focus of this study is metaphonological ability in Somali adult English Language Learners (ELLs) currently engaged in second language literacy training who have little or no native language literacy skills. This study measures their metaphonological ability through several tasks: phoneme identification, word-initial

phoneme addition and deletion, syllable addition and deletion, rhyme awareness, phonological fluency, and semantic fluency.

My questions are, to what extent are non-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task?

Through performing these tasks with adult Somali ELLs, I hope to contribute to this recently growing foundation of research of the SLA of non-literate adult language learners. This can eventually lead to the best educational methods possible to serve this particular and sizable population of language learners, and a greater understanding of second language acquisition.

In the following chapter I will review the major differences found thus far in research comparing literate and non-alphabetically literate adults. These studies reveal differences in these two groups in their capacities to “notice” second language features, in their brain activity while attending to specific oral language tasks, in their phonemic awareness and linguistic segmentation ability, and evidence of reliance upon semantics over phonology for processing oral language. The vast majority of these studies are native-language studies, which further points to the need for more studies like these to be performed with language learners.

In chapter three I explain the methodology of this study, including an explanation of the research paradigm, setting, participants, research tools design and data analysis

methods. Chapter four is an analysis of the data and an exploration of the patterns that emerged and the correlations to previous studies. In chapter five I present a summary of the study, implications, limitations, and suggestions for further research.

CHAPTER 2—LITERATURE REVIEW

This chapter is a review of discoveries from research with non-literate adults in native language and non-native language studies. The research lays the foundation for the questions this study addresses: To what extent are non-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task?

As stated previously, research with non-literate and semi-literate adult language learners is gradually increasing, and this is primarily through the efforts of the Low-Educated Second Language and Literacy Acquisition [LESLLA] forum, which is dedicated to the study of non-literate and semi-literate adult language learners. Findings from these studies will be described later in this chapter. Yet much of the research with non-literate adults is still, at this point, from native language studies (Morais, et al., 1979; Read, et al., 1986; Adrian, et al., 1995; Lukatela, et al., 1995; Reis & Castro-Caldas, 1997; Castro-Caldas, Petersson, Reis, Stone-Elander & Ingvar, 1998; Loureiro, et al., 2004; Castro-Caldas, 2004; Durgunoğlu & Öney, 2002; Ostrosky-Solis, Garcia & Perez, 2004). The native-language studies reveal 1) different brain activation patterns in language processing, 2) a lack of phonemic awareness and linguistic segmentation ability

in non-literate adults, and 3) evidence of different language processing strategies, such as a heavy reliance on semantics over phonology. These studies are enlightening regarding the effects of literacy on the brain and on perception of language, but further studies within the field of SLA are necessary to see how these differences affect second language acquisition. It is possible that current SLA theories *only* pertain to literate L2 learners (Bigelow & Tarone, 2004), since this is the only population that has been thoroughly studied thus far (Kurvers, Vallen & van Hout, 2006; Tarone & Bigelow, 2006 Young-Scholten & Strom, 2006). As the native-language studies have come first and laid a foundation for SLA research, they will be reviewed first here as well.

The review of literature will begin with an exploration of the how the noticing hypothesis may or may not pertain to low-literate and non-literate adult language learners, and proceed to the insights into non-literate adult language processing provided brain research. Next, L1 studies of adult phonemic awareness and linguistic segmentation ability are reviewed, followed by L1 and L2 research providing evidence of semantic processing strategies, and studies exploring whether or not there is a critical period for acquiring phoneme awareness and metaphonological ability. Finally L2 adult phonemic awareness and linguistic segmentation ability studies are described.

Before delving deeply into the research, some definitions will be helpful in fully understanding the participants and topics of the studies.

Definitions

Non-literate adult ELLs fall into several categories. The label *pre-literate learner* describes those from either unwritten native language backgrounds, or from native

language backgrounds for which literacy is a very recent or uncommon practice. *Non-literate learners* are adults from literate societies who have not had access to literacy training, usually due to social, political, or economic reasons. *Semi-literate learners* gained some literacy training in their native language at some point in their lives, but never developed this skill fully, also often for social, political, or economic reasons. *Non-Roman alphabet literate* learners are literate in languages which are written in non-roman alphabets. *Non-alphabet print literate* learners are those who have acquired some level of literacy in a language that uses a logographic script rather than an alphabetic print script (Huntley, 1992; Burt, Peyton, & Adams, 2003). The participants in this study received some literacy training in childhood in Arabic, not in their native language, and are currently engaged in English literacy training. They will be referred to as *low-literate*.

This is a study of *metaphonological ability*. *Metaphonological ability* refers to the ability to segment speech into increasingly smaller units—phrases, words, syllables, and finally phonemes as well as recognize rhyme (Adrian, et al., 1995). Another similar term which is common found in studies of phonemic awareness is *metalinguistic ability*. This comprises all aspects of linguistic analytical competence: segmenting sentences into words, words into syllables, syllables into phonemes, phoneme manipulation, and judgment of rhyme (Kurvers, et al., 2006). *Phonemic awareness*, one aspect of this study, is an awareness of the smallest unit of sound in a language that can affect meaning, and the ability to isolate it from other sounds. This is at times referred to as *phonological awareness* which also describes awareness of sound patterns (Adrian, et al. 1995; Durgunoğlu & Öney, 2002). *Phonetic discrimination or detection*, or *phonological*

sensitivity is the ability to simply identify distinct sounds. In this study this is referred to as *phonemic identification*.

The words *rime* and *rhyme* are used often in this area of research and though they have distinct meanings they are sometimes used interchangeably. *Rime* refers to the remainder of a syllable (i.e., the vowel and any following consonants) after the onset. The onset is either a single consonant or a consonant cluster. For example, in the word *stop*, *st* is the onset and *op* is the rime. *Rimes* are spelled and pronounced the same. Therefore there is a distinction between this and *rhyme*, because *rhyme* often refers to auditory rhyme, where two *rimes* may sound the same but may not be spelled the same (Riley, 1999; Love & Reilly, 2004). In this literature review, I will preserve whichever word the authors of each study have chosen, but for my own research I will use the term *rhyme*, as I am focusing on the participants' attention to sound only, not spelling.

Several tests are commonly used in metaphonological ability studies. Phoneme detection, (or identification) is often measured by asking participants to identify the first “sound” in a word. For example, a researcher may ask, *what is the first sound in “bed”?* and the correct answer is not the letter b, but the sound /b/ (Learning Disabilities Association of Minnesota, 2005; Trupke, 2007). Other ways to test phoneme identification are to ask participants to identify the first sound in three spoken words, all with the same initial phoneme (Learning Disabilities Association of Minnesota, 2005; Trupke, 2007), to identify the “odd one out,” that is, the word in a list of three spoken words that does not begin with the same initial phoneme as the other two words (Young-Scholten & Strom, 2006) or by attempting to count or tap out the number of phonemes in

a word (Durgunoğlu & Öney, 2002; Learning Disabilities Association of Minnesota, 2005; Trupke, 2007). Syllable discrimination is often tested by asking participants, *is /ba/ contained in /bara/?* (Adrian, et al., 1995).

Addition and deletion tests are performed for both phonemes and syllables and are generally done word-initially. For example, to test phoneme addition and deletion, a researcher would ask: *If you add /k/ to /æm/ what do you have? Or if you take /m/ away from /mɪl/ what do you have?* (Morais, et al., 1979; Read, et al., 1986; Morais, et al., 1986; Adrian, et al., 1995). To test syllable addition and deletion, a researcher would ask: *Add /be/ to /kə/ and what do you have? Or, take /su/ away from /sulən/ and what do you have?* (Morais, et al., 1986; Adrian, et al., 1995).

Awareness of phoneme and syllable is also tested through counting tasks, where participants must count the number of sounds or syllables they hear in a word. (Lukatela, 1995; Young-Scholten & Strom, 2006). Phoneme awareness is also measured through blending tasks, where participants must blend a series of phonemes together into one word (Durgunoğlu & Öney, 2002; Trupke, 2007).

Rhyme awareness is often tested by asking participants to identify whether or not two words rhyme in a series of spoken pairs of words (Morais, et al., 1986; Adrian, et al., 1995). It is also tested through odd one out tasks, as with initial phoneme (Young-Scholten & Strom, 2006; Trupke, 2007).

Phonological fluency has been tested by asking participants to produce as many words as they can beginning with a particular sound within a time limit (Loureiro, et al.,

2004 and Reis & Castro-Caldas, 1997) and semantic fluency has been tested through asking participants to name as many words that are semantically related, for example, animals or furniture, as they can within a time limit (Reis & Castro-Caldas, 1997).

Noticing

In studies of metaphonological ability, awareness and manipulation ability are often tested, which is essentially the testing of noticing. The Noticing Hypothesis (Schmidt, 1994) states that conscious noticing of specific language features is vital for language acquisition. Since non-literate adults in native language studies have not demonstrated awareness of units smaller than words, or even a full understanding of what constitutes a word (these studies will be discussed in a later section), it is reasonable to question if non-literate or low-literate adult ELLs even notice discrete L2 linguistic forms at all. As Olson (2002) argues, the introduction of writing creates a new kind of consciousness where language can be noticed and analyzed differently than before. If non-literate adults lack this ability, how do they successfully acquire L2 oral skills, as many do (Tarone and Bigelow, 2005)?

There are at least two possible explanations for why non-literate adult ELLs may be able to acquire multiple languages without the conscious noticing provided by literacy. One is that non-literate adults retain the ability to “unconsciously internalize” a new language the same way they learned their first language (that is, an ability which literate adults lose). Another explanation is that the noticing hypothesis is only true for the acquisition of higher-order language skills and not necessary for oral conversational or survival language acquisition (Tarone & Bigelow, 2005).

One of the few studies performed so far with non-literate (and semi-literate) adult ELLs tested the noticing ability of two groups of adult ELLs (ages 15—27), a low-literate group and a moderate-literate group, to recall oral recasts (Bigelow, Delmas, Hansen & Tarone, 2006 and Tarone & Bigelow 2006). The participants were given four spot-the-difference tasks in which they had to ask questions to uncover the differences in two similar drawings. Their grammatical errors were recast and they were instructed to try to repeat the correction they heard. This task protocol was a partial replication of a recast recall study done with highly literate college-age ELLs by Philp in 2003, and a comparison reveals significant differences.

Overall, the moderate literacy group successfully repeated more recasts than the low-literacy group, indicating that literacy level is related to ability to produce correct or modified recalls of recasts. However, the moderate-literacy group did not recall longer recasts significantly better than the low-literacy group. In fact, the length or number of changes (1 change or 2+ changes) in the recast was not a significant variable affecting whether or not the participants were able to produce correct or modified recalls of the recasts. In Philp's 2003 study, the number of changes significantly affected the participants' ability to recall a recast.

The ability of the low-literate group to produce correct or modified recall of recasts with more than two changes may indicate that adult ELLs with low literacy have developed strategies for holding more language in short-term memory—strategies that more literate learners may lack. As other researchers working with non-literate adults have found, without literacy, adult learners lack the ability to assign a temporary, mental

visual-graphic image (Castro-Caldas, et al., 1998) for words they hear which have no semantic meaning (further explanation will be given in the following section). Bigelow et al. (2006) argue that while this ability is necessary for conscious noticing, their findings suggest that less-literate learners successfully acquire a second language without the same conscious noticing of a graphic image.

Aside from differences in noticing, concrete physical differences have also been discovered in the field of brain research in native language studies. These will be delineated in the following section.

Brain Research

Brain research, using positron emission tomography (PET) among other brain scanning methods, reveals several significant differences in the brain activity of non-literate and literate adults in native language studies (Castro-Caldas, et al., 1998; Castro-Caldas, 2004; Ostrosky-Solis, et al., 2004). This is evidence that non-literate adult language learners should be regarded as a separate category and researched in their own right.

While attempting to repeat pseudo-words, adult literate and non-literate participants exhibit different brain activation patterns (Castro-Caldas, et al., 1998; Castro-Caldas, 2004). Pseudo-words are words which follow the phonological rules of a particular language but have no meaning in that language. No difference was found while the two groups repeated real words. However, researchers noted that, while repeating pseudo-words, the adults who gained literacy in childhood exhibited a “phonological loop,” or a pattern of brain activity seen while attending to phonology. Non-literate

participants do not activate this loop while repeating pseudo-words (Castro-Caldas, 2004).

Another related study (Ostrosky-Solis, et al., 2004) comparing adults who learned to read in childhood with non-literate adults reveals that non-literate adults do not activate specific regions literate adults activate while listening to and trying to remember real words. The non-literate adults remembered the words as well as the literate adults, but did not demonstrate intrahemispheric activity or activity in parieto-temporal areas, indicating that literacy acquired in childhood changes the areas of the brain adults involve not only in reading but also in accessing verbal memory. Adults who have only recently acquired literacy use the right brain hemisphere for processing both oral and written language more than adults literate since childhood (Castro-Caldas 2003, cited in Castro-Caldas, 2004).

The findings of these studies with non-literate adults in native-language settings might shed light on second language acquisition in non-literate adult language learners. Pseudo-words are meaningless, as are all L2 vocabulary as they are introduced. When beginning-level adult ELLS are confronted with low-frequency words, they treat them as “nonsense words,” or, pseudo-words (Young-Scholten & Strom, 2006). Therefore the brain research findings beg the question: do non-literate adult language learners activate different parts of their brains than literate learners while learning new words? The answer to this question is presently unknown, but it may be a significant factor in non-literate adult SLA.

L1 Adult Phonemic Awareness and Linguistic Segmentation Ability

Further quantifiable differences between literate and non-literate adults are found in the native language phonemic awareness studies. Adults with little or no alphabet-print literacy in their native language demonstrate phonetic discrimination ability (Adrian, et al., 1995; Loureiro, et al., 2004), but no ability to *manipulate* language on the phoneme level. Non-literate adults are unable (1.3 percent mean correct score) to reverse phonemes (*sol* would become *los*), while semi-literate and literate adults fare much better at this task (31.2 percent mean and 72 percent mean, respectively) (Adrian, et al., 1995). Also, non-alphabetic literate adults very rarely succeed at word-initially adding or deleting a phoneme, while literate adults of similar social, economic, language, and cultural background nearly always succeed (Morais, et al., 1979; Morais, Bertelson, Cary & Alegria, 1986; Adrian, et al., 1995; Loureiro, et al, 2004; Lukatela et al., 1995). However, non-literate participants performed considerably better when the phonemic manipulation task involved deleting a syllabic vowel (/ʌ/) as opposed to a stop consonant (/p/) (Morais et al., 1986) or a fricative (/f/) (Morais et al, 1988).

Non-literate adults also perform somewhat better on language analysis tasks involving awareness of syllables and rhyme than they do with phonemes, but still far worse on all tasks than the semi-literate, “ex-illiterate,” (those who acquired literacy in adulthood) (Morais, et al., 1986) and literate (those who acquired literacy during childhood) (Adrian, et al., 1995). Specifically, in native language studies non-literate adults are able to identify rhyme versus non-rhyme (Loureiro, et al., 2004; Morais, et al., 1986; Adrian, et al., 1995). Non-literate adults are able to count syllables quite accurately

(Lukatela, et al., 2004), and detect syllables (Morais, et al., 1986; Adrian, et al., 1995), but still unable to delete syllables and unable to reverse syllables (e.g., /pa-ke/ would become /ke-pa/) (Adrian, et al., 1995). Therefore it seems the capacity to analyze speech into syllable-level units and to detect sound similarity may be developed without literacy training, but the ability to analyze and manipulate language on the phoneme level requires literacy training (Morais, et al., 1979; Adrian, et al., 1995).

And, it is not simply literacy that contributes so much to phonemic awareness but alphabetic-literacy in particular. Adults literate in a logographic rather than phonetic alphabet performed almost identically to the non-literate adults in other studies on phoneme addition and deletion tests (Read, et al., 1986).

Even the understanding of what constitutes a “word” and word boundaries may be dependent upon literacy. Although Spanish-speaking non-literate adults perform well in a word reversal task (say “*broken carrot*” backwards: “*carrot broken*”) (Adrian, et al., 1995) most Portuguese-speaking non-literate adults in one study produced short phrases versus long phrases when asked to provide examples of short words and long words. In the same study, non-literate adults also judged phonological length of words on semantic size, emotional importance, and the speed or intensity with which the words were spoken, rather than the true phonological length (number of sounds or syllables) (Kolinsky, Cary, & Morais, 1987). Non-literate adults exhibit reliance on semantics over phonology in several other studies which will be discussed in the next section.

Evidence of Semantic Processing Strategies from L1 and L2 Research

In attempting the task of word-initially adding and deleting phonemes, non-literate adults in native language studies tend to make errors which result in meaningful words when the correct answers would be meaningless words (Morais, et al., 1979; Read, et al., 1986). They also perform better on word-initial phoneme addition and deletion tasks when the correct response is a meaningful word than when it is a non-word (Morais, et al., 1979; Read, et al., 1986). This is evidence of not only a lack of phonological ability in non-literate adults but also a reliance on semantic processing strategies in language analysis over phonological or other cognitive strategies.

In tests where non-literate and literate adults must repeat real words, both groups perform well (Reis & Castro-Caldas 1997; Castro-Caldas, et al., 1998, Loureiro, et al., 2004). However, in tests of word and pseudo-word repetition, non-literate adults tend to convert the pseudo-words into words, (“lexicosemantic errors”) which reveals that non-literate adults process the meaning of a word over its form (Reis & Castro-Caldas 1997; Castro-Caldas, et al., 1998). However, non-literates also make phonological errors in attempting to repeat pseudo-words, four times as many, in fact, as literates attempting the same task (Castro-Caldas, et al., 1998).

Non-literate adults also tend to produce semantically-related words when the task is to repeat or produce phonologically-related words (Reis & Castro-Caldas, 1997). The specific test that established this was a modified word pair association test from the Wechsler Memory Scale (Wechsler, 1945, as cited in Reis & Castro-Caldas, 1997, p. 446). Participants had to repeat ten pairs of words after listening to all of them: five were

semantically-related, five were phonologically-related. Non-literate participants performed worse than literate participants on both types of pairs, and their repetition of phonologically-related pairs was worse than their repetition of semantically-related pairs. Both groups made semantically-related errors, but the non-literate group made more errors overall.

In semantic fluency versus phonological fluency tasks, where participants were given two minutes to produce names of animals or furniture and two minutes to produce words beginning with /p/ or /b/, non-literate adult participants performed worse on both tasks than literate participants, and their performance on the phonological fluency task was worse than their performance on the semantic fluency task. (Reis & Castro-Caldas, 1997).

These results indicate that non-literate adults process language mostly, if not entirely, through semantics rather than phonology (Reis & Castro-Caldas 1997). Non-literate adults lack a “visuographic dimension” to the processing of oral language, which literate participants in these native-language studies rely on to help them not only remember and reproduce meaningless words, but also to aid them in linguistic segmentation (Castro-Caldas, et al., 1998).

Further evidence of a predominant use of semantic strategy in non-literate adults is seen in one second-language study. In the qualitative analysis of one participant’s performance in the oral recast recall study previously described (Tarone & Bigelow, 2006), the participant incorporated the different stress pattern of the recast before, or rather than, incorporating the subject/auxiliary inversion of the recast. Tarone and

Bigelow (2006) relate this with the difficulty non-literate participants have had with inverting syllables in the native language studies. The participant also was able to retain and use new vocabulary presented in recasts more quickly and more successfully than he was able to correct his grammar based on the recasts. This data indicates that this low-literate learner relies heavily on semantic processing strategies. The participant is less able to notice and remember linguistic units that have no direct semantic value, such as the inversion of a subject and auxiliary in a recast.

Critical Period?

If non-literate adults lack phonemic awareness, and if phonemic awareness is helpful in acquiring literacy and higher-order language skills, the question becomes, can they acquire it in adulthood? Native language studies (Morais, et al., 1986; Durgunoğlu & Öney, 2002) and recently a few second-language studies (Gombert, 1994; Young-Scholten & Strom, 2006; Trupke, 2007) indicate adulthood is not too late. Non-literate adults in native language studies do improve their phonemic awareness with training. In successive word-initial phoneme addition and deletion trials, with explicit instruction and corrective feedback, non-literate participants drastically improve in their performance (Morais, et al., 1986). Non-literate adults have also been found to improve in phonological awareness after ninety hours of literacy training (Durgunoğlu & Öney, 2002). SLA studies have also revealed improvements in phonemic awareness with weeks of classroom training (Gombert, 1994; Trupke, 2007).

L2 Adult Phonemic Awareness and Linguistic Segmentation Ability

As stated previously, the study of non-literate adult language learners is recently emerging. Several significant studies come from the Low-Educated Second Language and Literacy Acquisition [LESLLA] forum, which is dedicated to the study of non-literate and semi-literate adult language learners. Only one study similar to the native language studies with non-literate adults could be found by the researcher prior to the initiation of LESLLA (Gombert, 1994).

Gombert (1994) studied metalinguistic awareness and the effects of metalinguistic training in three groups of adult language learners—an illiterate group, a partial-illiterate group (who had been learning to read for less than one year) and a literate group. They were tested in their second language in their ability to judge the phonological length of words, to delete a word-initial phoneme, and to segment sentences into words. The literate participants performed the best, followed by the partial illiterates and then the illiterates. There was a significant difference between the partial illiterates and the literates in phonological judgments and word-initial phoneme deletion. However, all groups improved with training, with the illiterate participants making the largest gains.

Kurvers, et al., (2006) tested phonological awareness as well as other linguistic competencies in three groups: 1) “illiterate” adults (having less than two years of primary education and no decoding skills in any language), 2) literate adults (having no more than six years of primary education), and 3) children who had not yet learned to read. They drew comparisons among the groups, to see if there is a stronger effect for literacy or age on phonological awareness. This study was carried out with immigrants mostly from

Morocco, Turkey, and Somalia in the Netherlands. Participants were given the choice to be tested in their native language or Dutch. All participants were simultaneously engaged in Dutch-as-a-second-language classes.

They were tested in rhyme production, in which a high-frequency rhyming word was elicited as the correct answer; rhyme judgment; word length judgment, word judgment (i.e., Is *monkey* a word? Is *the* a word? Is *He is reading a book* a word? Is *houses* a word?); and progressive segmentation, in which participants had to segment a sentence into increasingly smaller units, with the goal being reaching sub-lexical units and even phonemes.

The children performed better on the rhyme production task than both groups of adults. The non-literate adults tended to produce alliteration instead of rhyme and also semantically-related responses instead of rhyming words, which is further evidence of the predominant use of semantic strategies in non-literate adults. Similarly, in the rhyme judgment task, all three groups were more able determine that two rhyming words rhymed than that two words related in meaning did not rhyme, revealing that even with up to six years of schooling (as the adults in the literate group had), semantic connections may be somewhat stronger than phonological connections.

The non-literate adults were almost entirely unable to segment words into sub-lexical units, but when they were able, they only reached syllable level. They segmented sentences using semantic and pragmatic strategies rather than formal linguistic strategies. They focused on content, entire utterances, and supra-segmental features of task items

(volume, manner, or stress with which they were spoken) rather than attending to any segmental properties.

There was a significant difference in the performance of the literate and illiterate adults on nearly all tasks, despite the relatively small amount of primary education the literate had received. Therefore it seems that even a small amount of literacy training, even when received many years ago, significantly affects adults' metalinguistic ability.

Young-Scholten & Strom (2006) studied reading level, phonological awareness, and linguistic competence in Somali and Vietnamese adult ELLs in beginning literacy level classes in the U.S. About half the adult participants had had some native language literacy training (five years or less), so comparisons were possible between the schooled and unschooled adults. The adult participants' scores were also compared with those of children who had not yet learned to read on similar tests in previous studies, the idea being that if they are similar then they may have the same potential to acquire literacy. The tests were carried out in first the participants' native language and then in English. The participants did not perform better on the tasks in their native language, which could show they were still figuring out the directions during the first portion.

The participants were tested on their phonological awareness: word boundaries, syllable counting, rhyme identification, onset awareness (initial consonant sound), and word-initial, word-final, and word-medial phoneme deletion. (In previous adult native language studies, only the addition or deletion of the initial phoneme, or onset, was tested.) They were also tested in both native language and English literacy and decoding

ability and in English linguistic competence and syntax level. Only three participants demonstrated true decoding ability.

The non-literate adults displayed, for the most part, the same patterns in awareness of phonology as four-year-old children. That is, their awareness of word was strongest, followed by syllable, rhyme, and onset with very little or no phoneme awareness. One exception was that the Somali participants actually showed greater awareness of rhyme and onset than syllable. Non-literate adults identified content words as “words” far more often than they identified function words as words, which is unlike children, who identify both as words equally (and have had greater exposure to the language and have already internalized the grammar).

The schooled adults performed only slightly better than the unschooled adults at indentifying syllables, onsets, and rhymes, and more significantly better at isolating and manipulating phonemes. Thus there is a strong correlation between phonemic awareness and reading (or decoding) ability in adults, as there is with children. That is, awareness of word, syllable, rhyme, and onset may be achieved prior to reading instruction, but phonemic awareness is only possible after achieving decoding ability. The correlation between onset and rhyme awareness and reading ability is significant but much less profound.

In this study, the order of emergence of metaphonological units in non-literate adults appears to mostly follow that of children (though the greater awareness of rhyme and onset than syllable in the Somali participants needs further exploration) and it

appears that as with children, lack of phonemic awareness and lack of decoding skills are directly linked in non-literate adult language learners.

A second study with non-literate and semi-literate adult Somali (and other East African) ELL students in the U.S. demonstrates that whole-part-whole instruction can help learners improve in both phonemic awareness and decoding ability. Trupke (2007) pre-tested phonemic awareness and decoding ability with female adult ELLs from Somalia and Ethiopia. Specifically, they were tested in awareness of initial sound (onset), detection of same sound (initial), rhyme awareness, and ability to blend and segment (count) sounds. This was followed by ten weeks of whole-part-whole instruction. Whole-part-whole instruction focuses learner attention on the distinct features of words they already know and can study in a meaningful context, features such as phonemes and also rimes, or “word families.” The learners showed post-test gains in all areas, with the most significant phonemic awareness gains made in the areas of initial sound, detection of same letter sound, and blending sounds. There was not a lot of gain on rhyming ability, probably mostly because the participants were already quite good at this task. Counting sounds remained the most difficult and very little improvement was made in this area by any participant. Another significant finding from this study was that age and hours of classroom attendance did not have strong effects on the results.

Summary

In this chapter I have reviewed native language and second language studies which have established significant differences between non-literate or semi-literate adults and literate adults. Semi-literate adults performed differently than highly literate adult

ELLs in a recast recall task. Native language studies have revealed that non-literate adults activate different regions of the brain than literate adults do while attempting to repeat meaningless words. Both native language and second language studies have revealed that non-literate and semi-literate or low-literate adults perform poorly with metaphonological ability tests that literate adults perform well on—specifically phoneme addition, deletion, and blending. They struggle with syllable manipulation and rhyme identification and production, but to a lesser extent. Non-literate adults also perform more poorly than literate adults on analysis of phonological length of words; lexical segmentation; and pseudo-word repetition. However, a great deal of further study is necessary to firmly establish these findings, specifically in the realm of SLA with the language backgrounds present in U.S. adult ESL classrooms today.

The research questions and methodology of this study are based on the body of research with non-literate adults, mostly in native language studies (Morais, Cary Alegria & Bertelson, 1979; Morais, Bertelson, Cary & Alegria, 1986; Adrian, Alegria & Morais, 1995; Reis & Castro-Caldas 1997, and others) which were reviewed in this chapter, and it was also informed by the recent SLA research as well (Young-Scholten & Strom, 2006; Kurvers, et al., 2006; Trupke, 2007).

The results of many of the previous studies are not necessarily generalizable to the participants in this study for several reasons, creating a need for the present and subsequent studies to be performed. First of all, the students involved in this study are from native language backgrounds different from those of almost any previous study (only Young-Scholten, 2006 and Trupke, 2007 included East African language

background adult ELLs). In some previous studies the participants were significantly older than the participants in this study (in Castro-Caldas et al., 1998 they were 60—70, Reis & Castro-Caldas 1997 participants were 50—70, Lukatela et al., 1995 participants were 55—76). Also, the participants of this study are simultaneously engaged in literacy training with the study, which was only the case in two previous studies native language studies (Adrian, et al., 1995 and Durgunoğlu & Öney, 2002). The participants in all the SLA research with semi-literate and non-literate adults have been simultaneously engaged or previously engaged in English literacy training, yet these studies alone do not answer all the questions they raise definitively, calling for more research to explore and potentially further solidify their results.

The next chapter, chapter three, is an explanation of the research paradigm and methodology of this study, including details regarding the participants, setting, instruments, and data collection and analysis.

CHAPTER 3—METHODS

This study is designed to uncover the metaphonological ability of a group of Somali adult ELLS who are simultaneously engaged in literacy training for the first time in their lives. It is designed to answer the following questions: To what extent are low-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task?

This chapter contains an explanation of the research paradigm and methodology, including a description of the participants, setting, instruments and data elicitation and analysis procedures.

Research Paradigm

This is an associational quantitative study. In associational quantitative studies, the goal of the research is to determine if a relationship exists between two or more variables and if so, the strength of the relationship (Mackey & Gass, 2005). The goal of this research is to determine if there is a relationship between literacy level and metaphonological ability, and literacy level and language processing strategies in low-literate, adult Somali ELLs. The relationship between alphabet-print literacy and phonemic awareness has been found to be reciprocal in native language studies (Morais,

et al., 1979; Durgunoğlu & Öney, 2002), but this has not been firmly established with adult ELLs. No variables were intentionally manipulated in order to test causality, as in experimental quantitative studies (Mackey & Gass, 2005). There is no control group, treatment, or pre-test/post-test design—the goal was to simply see what the participants are capable of presently, using one-shot design (Mackey & Gass, 2005). There are no explicit comparison groups in this study, but as each participant had a slightly different level of alphabet-print literacy, either because of some previous literacy training or because of their present literacy training, some comparisons were drawn among participants and their backgrounds and literacy levels and their performance on the tests.

Setting and Participants

The setting was an Adult Basic Education English as a Second Language school in Minnesota in which the researcher was a volunteer. The participants were selected from the lowest-level afternoon class, with the permission of the teacher. The informed consent, the interviews, and the tests were conducted as small or one-on-one pull-outs during class. Each participant missed no more than one and a half hour of class time total.

The participants are six female, low-literate Somali adult ELLs, ranging in age from 22 to 60. They had each attended school in the US for a short period of time ranging from two to seven months. The only school any of them attended while growing up was something they called “Qur’an school,” but none of them seemed to truly achieve literacy from their few years of schooling. Thus they are gaining alphabetic print literacy for the first time as adults. They were selected based on their lack of English literacy and

perceived lack of native language literacy. One participant was able to complete only half of the testing due to feeling ill.

Informed Consent and Confidentiality

Informed consent was obtained in small groups with the help of an interpreter who interpreted an informed consent form written in English. The participants were informed that their participation was voluntary and that their performance on the tests would not have any effect on their class grade or their teacher's opinion of them. They were informed that the interview and testing were solely for academic research purpose and that their identities would be confidential, that pseudonyms would be used in reference to them throughout the data presentation and analysis. To further protect the participants, all data, including the digital recordings of their interviews and tests, is stored in a hard drive which is available only to the researcher. The participants were allowed to ask questions before signing to confirm their consent and they were allowed to opt out at any time.

Instruments and Data Collection

Collection of data involved three instruments, each of which may be found in the Appendix section. Each segment was digitally-recorded so that the researcher could play back the participants' responses to analyze the data beyond the notes taken simultaneously with the testing.

Data Collection Technique One: Demographic Interview

The first research instrument is a demographic interview (Appendix A) which was conducted one-on-one with each participant with the help of an interpreter. The interview

gathered information on the participants' age, language background, and their experiences with literacy over the course of their lifetimes: whether or not they attended formal or informal schooling in their native language, if they learned to read in their native language, their experiences with literacy in their native language or second or third languages, and their experience in school and with literacy in English. The participants were familiar and comfortable with the researcher and interpreter, and the interviews were conducted one participant at a time to provide the greatest level of comfort for the participants to answer the questions.

Data Collection Technique Two: English and Somali Literacy Assessments

The second instrument was an informal English literacy and native language literacy assessment (Appendix B), also conducted one-on-one with the help of an interpreter. In the interview the participants self-reported their native language and English language literacy experience, and these informal assessments were used as an extra measure to ensure accurate literacy level reporting. In some previous studies, participants were given literacy tests (Adrian, et al., 1995; Lukatela, et al., 1995; Reis & Castro-Caldas, 1997; Castro-Caldas, et al., 1998; Durgunoğlu & Öney, 2002; Loureiro, et al., 2004;) while in others participants merely self-reported (Morais, et al, 1986; Read, et al., 1986; Kolinsky, Cary, & Morais, 1987). To be thorough, both techniques were used.

The English assessment consisted of ten simple English words and letters. Approximately half of the words were selected because they were thought to be high-frequency words in beginning ESL classrooms and half were selected specifically because they were thought to be lower-frequency words in beginning-level ESL

classrooms, in order to more accurately test their decoding ability (Young-Scholten & Strom, 2006).

All words and letters were typed on individual cards in large, lower-case Comic Sans font to imitate the handwriting often used in beginning-level adult ESL classrooms. One word at a time was held up or even handed to a participant and each was given ten seconds to read each word. If a participant failed to correctly read or decode three of the first five words, the word recognition portion was stopped and she was given the letter recognition test. Therefore not everyone was given the letter-recognition portion of the assessment. The ten letters were also typed in large Comic Sans font on individual flashcards and participants also had ten seconds to identify each letter.

The Somali language literacy assessment was administered in the same way, immediately following the English assessment. It consisted of ten high-frequency Somali words, selected with the help and verification of the interpreters. Participants were given ten seconds to read each word. The interpreter verified their success or lack thereof on the native language literacy assessment. The scores are recorded in the next chapter in Table 4.1. Each participant's most recent CASAS (Comprehensive Adult Student Assessment Systems) score was also obtained with permission from the teacher. CASAS is a widely-used tool in the U.S. for assessing basic English language skills in both native and non-native English speaking adults (CASAS, n.d.). This score is also recorded in Table 4.1 along with their ages, length of schooling in childhood and in the U.S., and their reading assessment scores.

Data Collection Technique Three: Metaphonological Ability Tests

The final instrument was an oral language manipulation test developed by the researcher, based on several previous studies which were explained in chapter two (Appendix C). The test was comprised of five parts:

1. phoneme identification
2. phoneme deletion and addition
3. syllable deletion and addition
4. rhyme identification
5. phonological fluency and semantic fluency

The test was also administered one-on-one with the help of an interpreter to ensure that the directions were fully understood. The interpreter explained the directions but did not aid the participant in any way in finding the answers. The participants were given up to ten seconds for each task in parts one—four and two minutes for each of parts five and six. Every effort was made on the part of the researcher to maintain identical production of the items for each participant, as well as the order and directions for each section.

Metaphonological Ability Tests Design

A strong effort was made to use only simple English pseudo-words. In previous studies, using non-words or pseudo-words yielded more significant results (Morais, et al., 1979). Using English pseudo-words ensures that participants do not rely upon recently-gained spelling knowledge and memorization. However, due to the large number of pseudo-words needed for the study, some words ended up being real words which were

simple but thought unlikely to be familiar to the participants (lower-frequency words most likely unknown to these beginning ELLs). Some words also ended up being real Somali words, but an interpreter verified that none of the words were offensive and that pronounced without a Somali accent, they would most likely not be recognized as a meaningful word. The pseudo-words were developed using real English words and changing one or two sounds within them (permissible by English phonological rules).

Another reason pseudo-words were used was in an attempt to make the participants' processing strategies more transparent. Since non-literate adults have been shown to rely heavily on semantic processing strategies, using meaningless or apparently meaningless words could reveal their phonological ability more clearly. Merely having to repeat pseudo-words requires phonological processing (Reis & Castro-Caldas, 1997), in which case non-literate adult second-language learners may use a phonological route much more often than the non-literate adults in the previous native language studies.

The test design includes phonemes which Somali and English share, in places of articulation they also share. The test includes the plosives /b/, /t/, /g/ and /k/, nasals /m/ and /n/, fricatives /s/, /ʃ/, /h/, and /f/, lateral approximates /l/ and /r/ and a syllabic vowel, /ʌ/. The syllabic vowel was included because non-literate adults have performed significantly better on phonemic awareness testing—both detection and manipulation—with a syllabic vowel than with a stop consonant (Morais, et. al, 1986). However, participants in previous studies have also tested better on any syllable test than they have

on phoneme tests (Morais et. al, 1986; Adrian et. al, 1995), and the syllabic nature of the vowel could be the reason.

The test items were designed to not include English sounds which are absent from Somali phonology or difficult for Somali speakers to produce. The phonemes /z/, /v/, /ʒ/, /ð/, /θ/, /ŋ/ and /p/ do not exist in Somali, so they were not used in the testing. Consonant clusters were also avoided as they are not present in Somali phonology (Conway, 2008).

In Somali, /t/ and /k/ only occur at the beginning of a syllable. The phoneme /m/ only occurs word-initially and word-medially (Conway, 2008). These patterns were followed in the design of the tests.

While /p/ does not exist as a phoneme in Somali, Somali speakers have a tendency to devoice /b/ word-initially and word-finally in Somali so that it resembles /p/. The phonemes /g/ and /d/ are also devoiced word-initially and word-finally, so that they resemble /k/ and /t/, respectively. Word-medially, /b/ weakens to /β/ and /d/ weakens to /ð/ (Conway, 2008). The phonemes /b/, /g/, and /d/ were not avoided due to these Somali articulation habits, but this was taken into consideration in the testing. That is, when participants devoiced one of these phonemes word-initially or word-finally, it was not considered incorrect.

The Somali language has long and short vowels and diphthongs. Somali vowels are similar enough to English vowels to not pose a significant problem for Somali ELLs (Conway, 2008), so no English vowels or diphthongs were avoided.

The rhyme identification task consisted of real English words rather than pseudo-words in order to test the participants' ability to focus on rhyme rather than meaning. The real words were simple, high-frequency words, likely to be known by the participants. One word in from each rhyming pair was paired elsewhere in the task with a semantically-related non-rhyming word. This design was influenced by the results of one second-language study in which all participants were more able to determine that two rhyming words rhymed than that two semantically-related words did not rhyme and in which non-literate adults tended to produce semantically-related words rather than rhyming words in a rhyme-production task (Kurvers, et al., 2006). Another influence on this design was one native language study in which non-literate adults were less able to recall phonologically-related words than semantically-related words (Reis & Castro-Caldas, 1997).

Piloting

The design of the instruments for this study was informed by a small amount of piloting with students who were not included in the study. For example, syllable identification was not included because it was the most often misunderstood portion in the piloting. The students involved in the piloting were from the same classes as the participants, and the piloting was performed during brief pull-outs from class, with the permission of the teachers. It was conducted on two days, with four students total, and different methods of testing phonemic awareness and linguistic segmentation were tried to refine how to best design the formal study.

Data Analysis

The information gathered from Instruments one and two, the interview, (age, native language, years of schooling in native language, years of schooling in English), along with the participants' scores on the English literacy and native language literacy assessments, and their CASAS scores was condensed and recorded in Table 4.1.

The analysis of Instrument three, the metaphonological ability test, consisted of analyzing the digital recordings alongside the notes the researcher took while administering the tests. In parts one through three, the participants' answers were determined either correct or incorrect, and further analyzed based on in what way they were correct or incorrect (e.g., correct first phoneme but included a schwa or other vowel, incorrect meaningful word rather than correct answer). In part four, answers were either correct or incorrect, and incorrect answers were categorized by type of error (e.g., semantic pair identified as a rhyme). In part five, the number of meaningful words elicited was recorded and the digital playback confirmed the count for each fluency test. The results of each metaphonological ability task for each participant can be found chapter four.

The results were analyzed further to determine if any of the findings are consistent with previous studies, and to discover if any patterns had emerged from the data collected on age, length of schooling, reading/decoding ability, and performance on the tasks.

Verification of Data

The design of this study allows for internal validity in several areas. The assistance of the interpreters in this study ensures that the participants understood the directions. The interpreters interpreted the directions for each task as well as the examples and the feedback from the researcher on the trial task items at the beginning of each task. Therefore if a participant was still unable to answer the questions, this was determined to be due to lack of knowledge or ability rather than lack of understanding the instructions.

In addition, all participants were comfortable and familiar with the researcher and interpreters, and the interviews and tests were conducted in the same space for each, which was a familiar and private space within the school.

The English and native language literacy assessments provide a verification of the reliability of the information reported in the demographic interview regarding their previous exposure to literacy. It is assumed the participants were honest on both the interview and in their ability or inability to perform on the literacy assessments.

The metaphonological ability test was abstract, as it used only “meaningless” words, which prevented any unreliability effect of participants determining the goal of the study and altering their answers accordingly. The piloting performed prior to the study also ensures greater reliability of the instruments in that items, examples, and directions that were unclear or not easily understandable were improved or removed.

Summary

This chapter has laid out the research paradigm and design of this study, as well as the setting and participants, the data collection techniques, analysis, and verification. The following chapter is an analysis of the collected data and comparisons with previous research and among the participants within this study. Chapter five will provide a summary, implications, limitations, and projections for further research.

CHAPTER 4—RESULTS AND DISCUSSION

This study was designed to answer the following questions: To what extent are non-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task?

The previous chapter explained the methodology of the study including the research paradigm, setting and participants, and data collection and analysis procedures. In this chapter all data are analyzed broadly and in-depth, with an explanation of correlations to previous studies and patterns that emerged in the data.

All instruments were employed in a private room with one participant at a time, with an interpreter as the only other person present. The sessions with each student were recorded with a digital recorder, and the researcher wrote down the participants' responses to the test items using the International Phonetic Alphabet (IPA) as well.

Data Collection Techniques One and Two: Demographic Interview and Literacy Assessment

The first instrument was the demographic interview (Appendix A). The purpose of this instrument was to gather information on the participants' experiences with and attitudes about literacy in their native language and their L2s. Some of the results of the

demographic interview are found in Table 4.1. The interview consisted of questions about the participants' age, native country and language, their experience with school and literacy throughout their lifetimes, and their feelings toward literacy and perception of their own literacy level.

When asked if they had attended school, all participants said no. However, it eventually came out in each interview that each participant had attended something interpreters translated as "Qur'an school" in early childhood for a short period ranging from two to five years. They clearly did not consider this to truly be "school." None of them considered themselves literate because of their Qur'an school attendance. Only two participants had parents who had any reading material around the home and they had only the Qur'an; only one had parents who read to her and helped her read the Qur'an.

In Qur'an school, most of the participants learned the Arabic alphabet, and one learned the Roman alphabet (used in Somali language) in this school. Only this student showed specific knowledge of the Somali alphabet on the Somali literacy test, although she could not read any full words. Other students who were able to read some Somali words were relying on their English decoding skills, which did not always help. The students were generally confident that they would be able to read letters and simple words in English, but all of them said reading is difficult for them.

Only two of the six reported that they try to read public signs in daily life. None of them ever attempt to write themselves notes or make lists in their daily life. Therefore, though these participants are becoming literate, they have not integrated literacy into their daily lives.

The English literacy assessment (Appendix B) was administered first. One word at a time was held up or even handed to a participant and each was given ten seconds to read each word. If the participant failed to correctly read or decode three of the first five words, the word recognition portion was stopped and they were given the letter recognition test. Participants then had ten seconds to identify each letter. The Somali literacy assessment (Appendix B) was given next and followed the same pattern.

Decoding

When a participant took the full allotted time to successfully read a word, and appeared to be “sounding it out,” it was determined that they were demonstrating decoding ability. This is noted in Table 4.1—three of the six participants demonstrated decoding ability on at least one of the English words they successfully read. Two of the six participants clearly used English decoding skills on the Somali literacy assessment, which helped them arrive at the correct answer with a few words, but not with others. The Somali language is written using Roman Alphabet letters, but the sound correspondence is different from English. The letter “c” is a voiced pharyngeal fricative (/ʕ/) in Somali (Saeed, 1999, as cited in Conway, 2008), so using knowledge of English literacy did not help the participants in reading the second word on the Somali literacy test, “cun.” Participant 1 was the only participant who demonstrated knowledge of the Somali alphabet as she attempted to read the Somali words, although she was not successful in reading a single word on the assessment.

There was one Somali word that everyone who read at least one word correctly was able to read, “wiil.” Participants 4 and 6 read only this word correctly on the Somali literacy assessment, and they seemed to be guessing based on English decoding skills.

Each participant’s CASAS score is recorded, because this is the assessment that was used to place them into the beginning literacy class at the Adult ESL program where they attend. A CASAS score of 180 or below on any form indicates that the test-taker has extremely limited English communication ability and may not be literate in any language (CASAS, n.d.).

Table 4.1
Demographic Interview and Literacy Assessment

Participant #/age	Time in the U.S.	Years of school in childhood / Somali reading score	Length of time in school in the US / English reading score	CASAS score*
1 / 46	7 months	2 years / 0 words, 2 letter recognition**	4 months 0 words, 4/10 letter recognition	160
2 / 31	Three years	5 years Qur'an school in Arabic 5/10, used English decoding skills	5—6 months 7/10, some decoding	178
3 / 60	Four years	3 years Qur'an school in Arabic / 5/10, used English decoding skills	3 months *** 9/10 words, no obvious use of decoding	172
4 / 28	2 years	5 years Qur'an school in Arabic 1/10 used English decoding skills	2.5 months 4/ 10 words and 10/10 letter recognition	174
5 / 41	2 years	2 years Qur'an school in Arabic 0/10	7 months 6/10, some decoding	172
6 / 22	4 years	1 year Qur'an school in Arabic 1/10 used English decoding skills	2—3 months 7/10, some decoding	180

*CASAS score was the most-recent score as of the time of the study, and was obtained from the teacher, with the permission of the participants.

**This participant was unable to read any Somali words, but she was able to identify two Somali letters which represent sounds differently than English letters.

***This participant indicated that her children had also taught her English literacy at home, which helps explain her high English reading score. The other participants did not indicate that anyone other than their teacher in school had ever helped them with English literacy

Data Collection Technique Three: Metaphonological Ability Test

The Metaphonological Ability Test can be found in Appendix C. Immediately following the literacy assessments, the participants were told that they were going to play games, like puzzles, with meaningless words. It was stressed, often multiple times

throughout the testing period, that the words had no meaning in any language. They were told to only pay attention to the sounds, not the “letters” or meaning. All instructions were repeated in Somali by an interpreter. They were given three examples, five trial items, and then ten experiment items. Every item was repeated three times. During the trial period, students were allowed to ask questions and receive help. They were told the correct answers if they were wrong in the trial items. No help or feedback was given during the experiment items, aside from a few instances where the directions were re-explained one more time only after the first test item, and an occasional reminder to listen only to the sounds and not to search for meaning. After receiving the directions in their own language, listening to examples and having a chance to try with help and feedback, if participants were unable to answer appropriately, it was assumed it was because they were simply unable and not due to misunderstanding.

Phoneme Identification

The participants were fairly successful at identifying word-initial phonemes. The six participants answered correctly 54 out of 60 times. However, the responses were pure phonemes only 18 times. Participants tended (22 times, or slightly more than one-third of the time) to add to their correct initial phoneme response a schwa or whatever vowel sound followed the initial phoneme in the word. These responses are counted as correct, but categorized as a sub-set. Another type of response that was counted correct was giving the “letter name” rather than a phoneme (14 times). This demonstrates that these participants were at times relying on their knowledge of literacy. The correct results by

participant can be found in Figure 4.1. Participants answered correctly on the two phoneme identification test items containing the /ʌ/ nine out of twelve times.

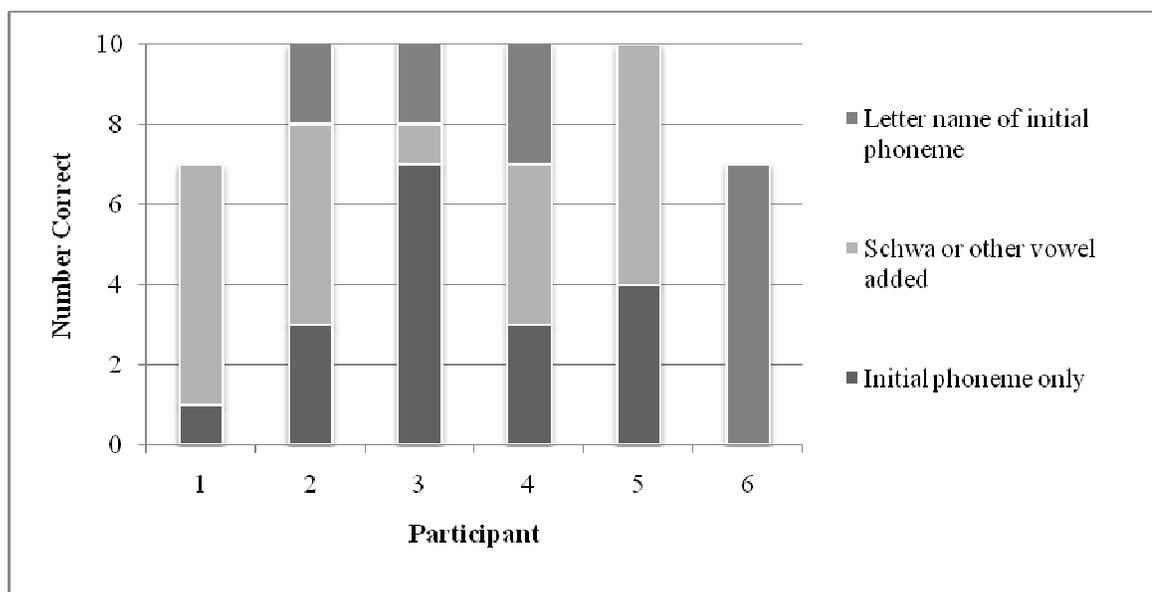


Figure 4.1. Correct Phoneme Identification Results by Participant

When participants responded incorrectly due to Somali phonological rules, the item was considered correct. For example, when they responded to the item /gar/ with the answer /k/, it was counted as correct, due to the fact that in Somali phonology, word-initial /g/ is devoiced and pronounced more like /k/ (Conway, 2008).

The few incorrect responses on this task were those where participants answered with the first consonant sound following the syllabic vowel, or with the final sound instead of the initial sound, or answering with the letter “s” rather than the sound /ʃ/.

One participant may have demonstrated use of semantic processing on the phoneme identification task, but only at the very beginning, while receiving instructions and examples. With the first example item, *What sound does /kil/ begin with?* For a

period of time she answered repeatedly, “cleaning.” However, once the directions were explained again and she was given more examples and trials, she answered more accurately, scoring seven correct out of ten on the test. It is also possible that she just misunderstood and thought that the object was to say what English word begins with the sound /kil/. She would still be incorrect, it would not be an example of semantic processing.

Phoneme Deletion and Addition

In order for the participants to understand and hear the items correctly, the script had to be changed from the original design which is found in Appendix C. For phoneme deletion, the items first were repeated three times, then participants were told to take away the first sound. For example:

Researcher: /nɪʃ/ ... /nɪʃ/ ... /nɪʃ/, take away /n/ and you have?

In the phoneme addition section, the script was changed more significantly. The script was, “What do you get if you add /k/ to /æɪn/?” but saying “add” and especially “to” profoundly confused the participants. Instead, the researcher simply pronounced the initial sound, paused, and then the rime. For example:

Researcher: What do you have if you add /n/ to /ol/?

/n/ ... /ol/ (followed by a longer pause and two more repetitions)

They were also instructed to “say them together, fast.”

In the phoneme deletion and addition tasks, some answers were impossible to judge as correct or incorrect, due to pronunciation or mumbling. In these cases, the benefit of the doubt was given to the participants and the items were considered correct,

and categorized as correct but unclear. When participants responded to the item *take away /l/ from /lod/ with /ot/*, it was counted as correct, due to the pattern of devoicing word-final /d/ in Somali (Conway, 2008).

Phoneme deletion. Overall, the participants scored 28 out of 60, or 47 percent correct on the phoneme deletion. The correct phoneme deletion task results for each participant can be found in Figure 4.2.

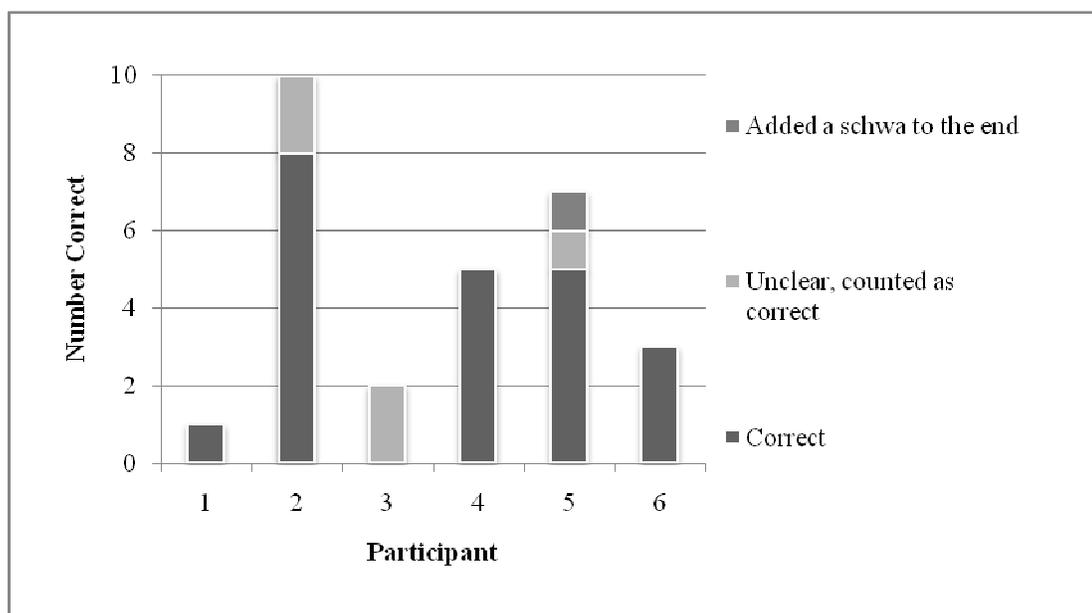


Figure 4.2. Correct Phoneme Deletion Results by Participant

Unlike the participants in previous studies (Morais et al., 1986 and Morais, et al., 1988), the participants did not perform better on the phoneme deletion task with the items beginning with the syllabic vowel /ʌ/ (though the Morais, et al, 1986 study specifically tested the participants' performance deleting /ʌ/ versus /p/ and /f/, respectively, and this

study did not specifically compare these sounds). In the phoneme deletion task, three participants answered both /Λ/ items correctly, and these were the three who scored the highest on this section (participants 2, 4, and 5). The other three participants were incorrect on both /Λ/ items.

Nearly two-thirds of all incorrect responses on the phoneme deletion task involved responding with the final sound only, (final sound only, perceived letter name of the final sound, or final sound + schwa). The phoneme deletion task errors by category can be found in Figure 4.3. Given that they also tended to answer in the phoneme identification task with the initial sound + schwa or other vowel sound, it seems that the participants tend to parse words into phonemes + vowel sound rather than distinct phonemes.

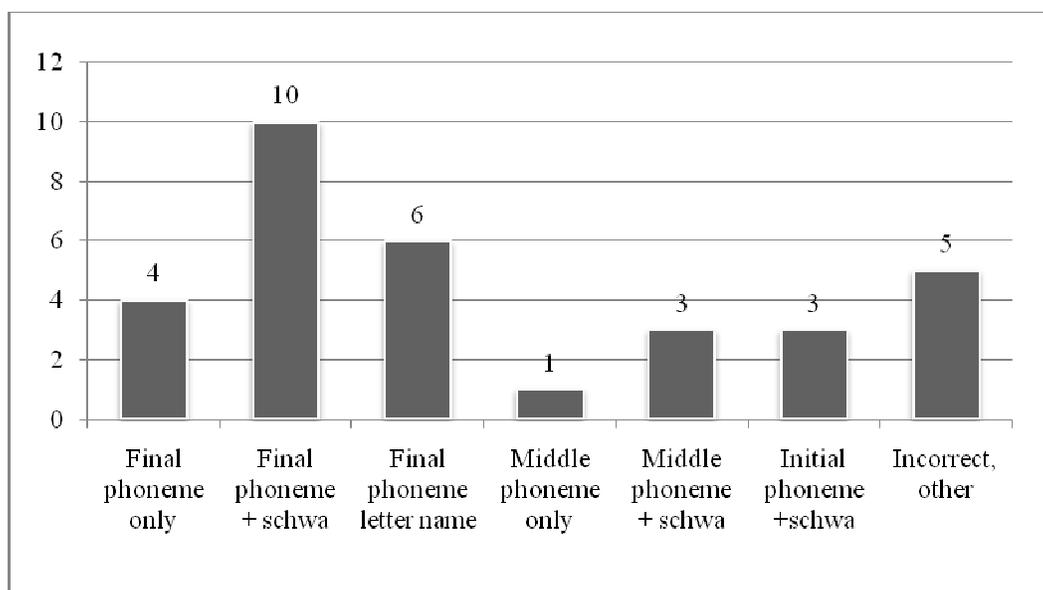
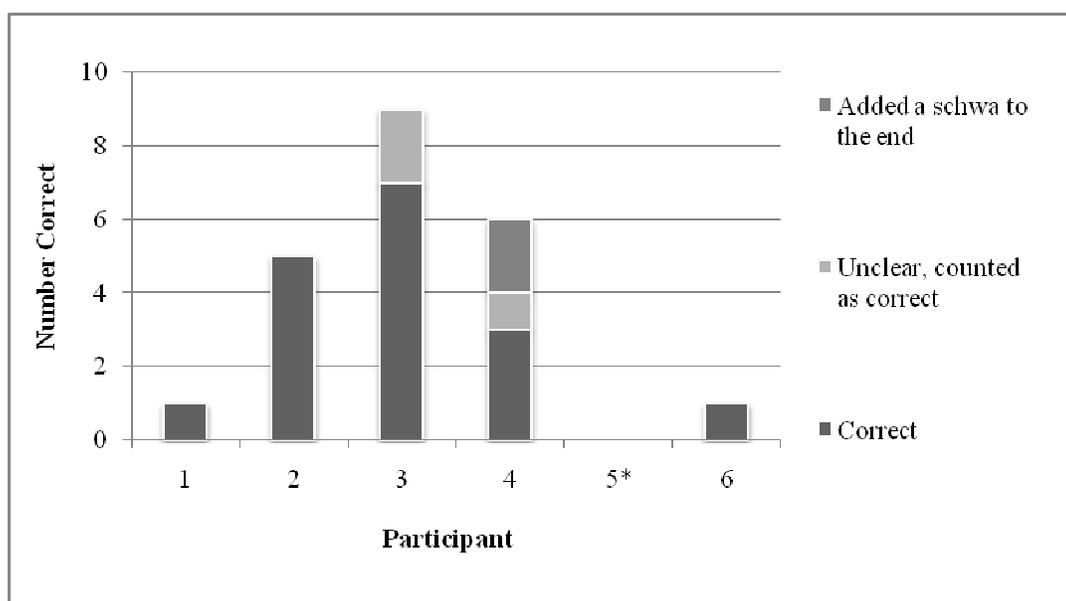


Figure 4.3. Phoneme Deletion Task Errors

The performance of the participants in this study on phoneme deletion fell between that of the non-literate adults and the “poorer readers” (adults who had either learned to read in adulthood or who had attended five or fewer years of school in childhood) in two previous native language studies. In the Adrian, et al., 1995 study, the non-literate adults had 12 percent correct, and the “poorer readers” had 61 percent correct. In the Morais, et al., 1986 study, the non-literate adults scored 18.6 percent on initial /p/ deletion; the poorer readers scored 62.5 percent. The score of the participants on phoneme deletion, 47 percent, is most similar to, though slightly higher than, that of the “partial illiterates” in another second-language study (Gombert, 1994), who scored 36 percent on this task. These “partial illiterate” adults had been involved in literacy training for less than one year, and unlike the participants in this study, had never attended school in childhood. Therefore it seems possible that the small amount of education the participants in this study received in childhood has affected their ability to delete word-initial phonemes.

Phoneme addition. The participants’ overall score on the phoneme addition task was 22 out of 54, or 41 percent. (Participant 5 only completed four of the ten phoneme addition items.) The phoneme addition task results by participant are in Figure 4.4.



*Participant 5 only completed four task items, but did not answer any of these four correctly.

Figure 4.4. Correct Phoneme Addition Results by Participant

In previous studies (Morais, et al., 1979; Read, et al., 1986) illiterate participants made semantically-based errors on both phoneme addition and deletion tasks, but in this study, participants only did so on the phoneme addition task, a total of 15 times.

Examples of this from the test items are in Table 4.2.

Table 4.2

Examples of Errors Categorized as Meaningful Word Instead of Answer on the Phoneme Addition Task

Researcher: /n/ ... /ol/

Participant: “out”

Researcher: /s/ ... /ol/

Participant: “store”

Researcher: /ʌ/ ... /mæg/

Participant: “mouth”

Researcher: /s/ ... /ol/

Participant: “scissor”

Researcher: /g/ ... /eb/

Participant: “book”

Phoneme addition task errors that were categorized as “Incorrect, other,” in Figure 4.5 below were those in which a participant maintained the space between the initial phoneme and the rime, inserted an extra sound or sounds or changed a sound or sounds, or simply repeated the rime or a variation on the rime. Only two participants answered any phoneme addition tasks beginning with /ʌ/ correctly and they were also the two who scored highest on that section (participants 3 and 4)

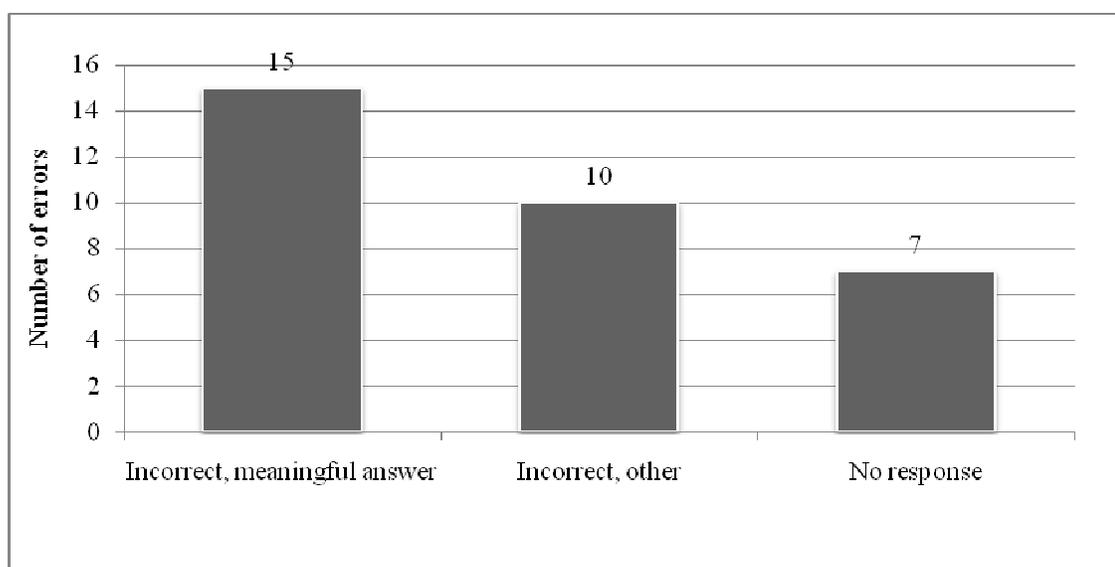
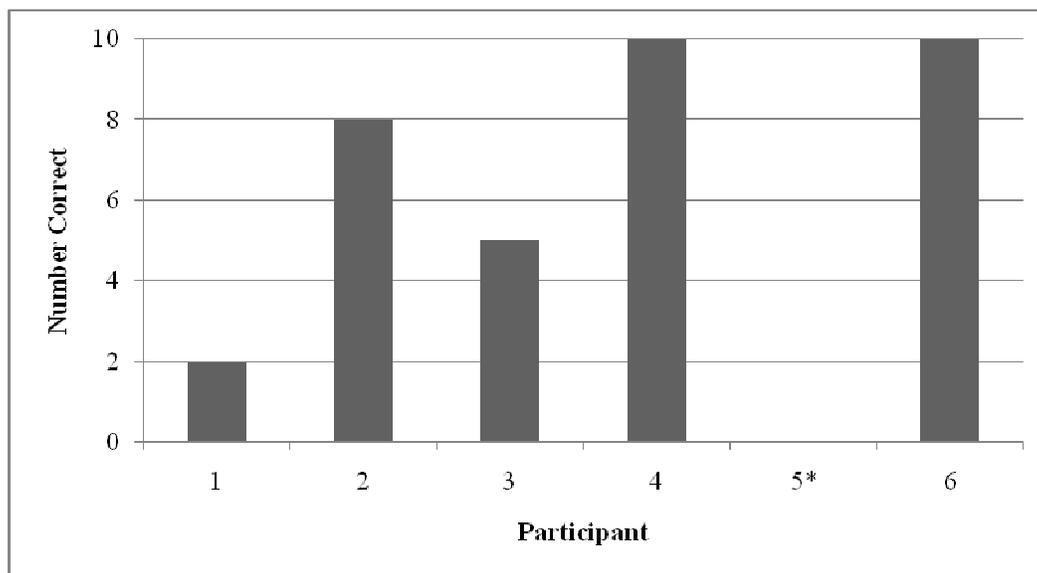


Figure 4.5. Phoneme Addition Task Errors

Syllable Deletion and Addition

The scripts for the directions to the Syllable Deletion and Addition tasks had to be altered for comprehension in the same way that the Phoneme Deletion and Addition task scripts were altered.

Syllable deletion. In total, the participants scored 35 correct out of 50 on the syllable deletion test, or 70 percent correct. The results by participant are presented in Figure 4.6.



*Participant 5 did not perform this task

Figure 4.6. Correct Syllable Deletion Results by Participant

On the syllable deletion task, three participants responded incorrectly with only the middle sound (i.e., the first part of the second syllable) or the final sound, and two participants added schwa or another vowel to this incomplete segment.

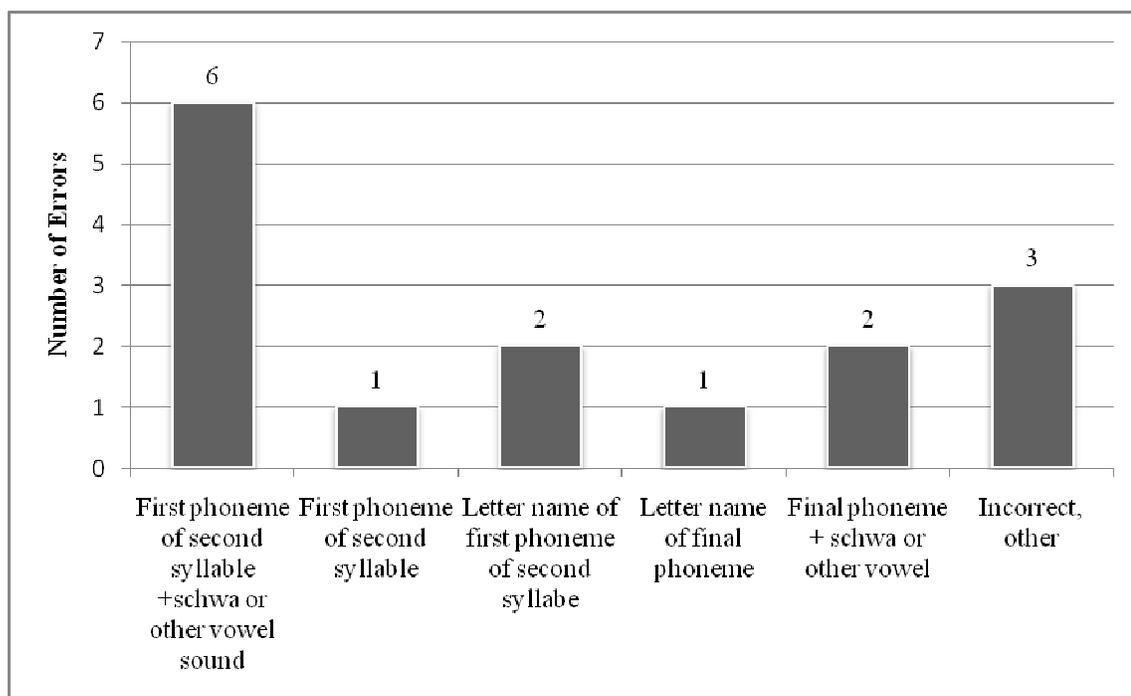
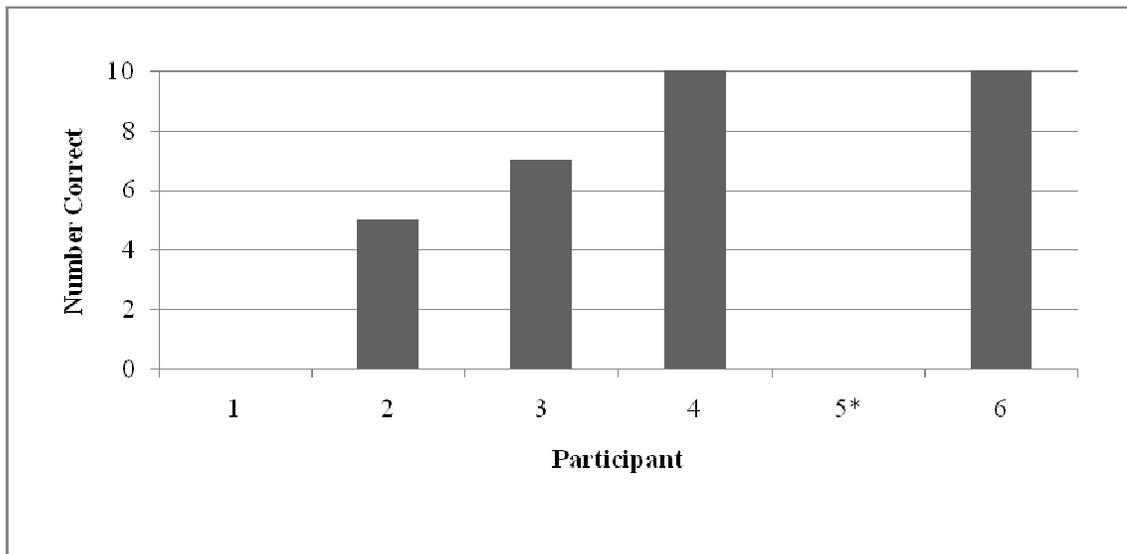


Figure 4.7. Syllable Deletion Errors

Syllable addition. Participants scored 26 out of 50 on the syllable addition task, or 52 percent. The results are presented by participant in Figure 4.8.



*Participant 5 did not perform this task

Figure 4.8. Correct Syllable Addition Results by Participant

On the syllable addition task, participants answered incorrectly by maintaining the space between the syllables, changing one or more of the sounds in one or both syllables (most commonly the final vowel sound), and adding an extra sound in the middle or the end of a pseudo-word. These results are presented in Figure 4.9.

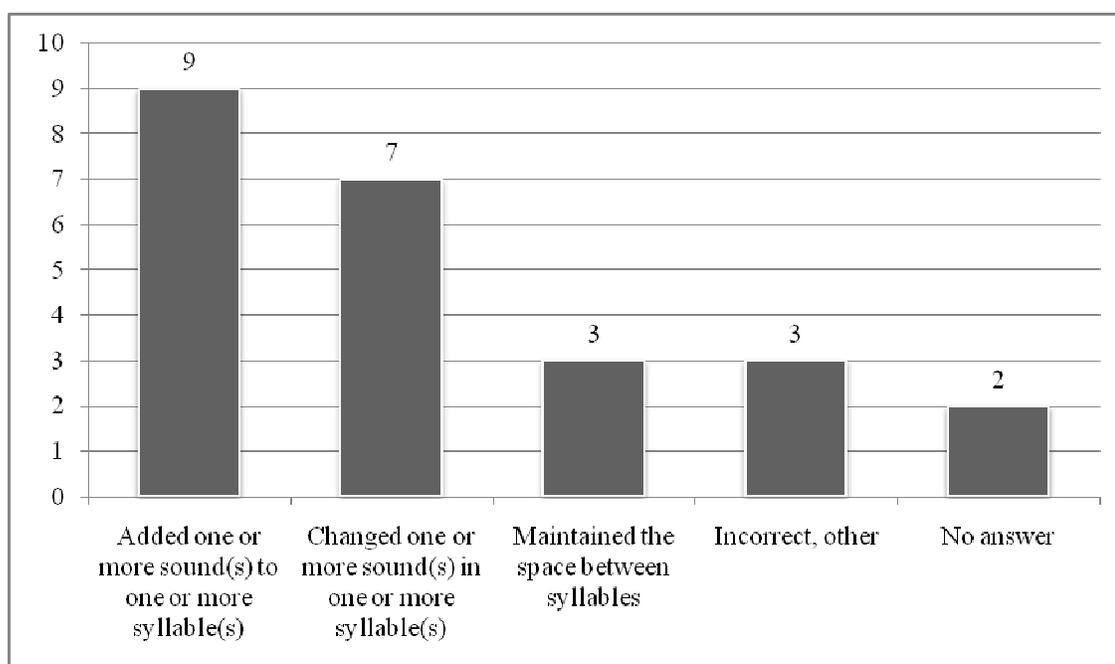


Figure 4.9. Syllable Addition Errors

Participants answered much more quickly and confidently on the syllable tasks than they did on the phoneme tasks. On the phoneme tests all participants required considerable more explanation and time, and most of them did not show any understanding of the tasks until halfway through the trial items. With the syllable tasks, most participants seemed to understand what they were to do within the examples—before starting the trials, whereas during the phoneme tasks, some participants seemed to be still trying to understand the task during the experimental period. The phoneme trials being first may have had an effect on their relative ease of comprehending the syllable tasks, or it may just be easier for these participants to manipulate language on the syllabic level.

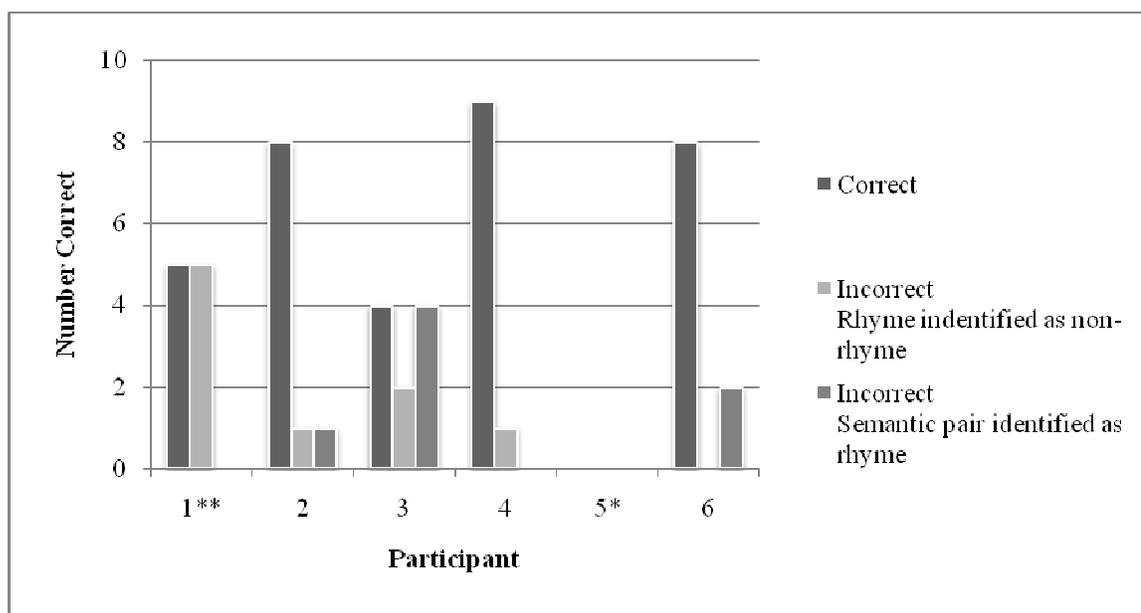
As in previous studies, (Morais, et. al, 1986; Adrian, et al., 1995; Young-Scholten & Strom, 2006) participants were more successful on the syllable tasks than the phoneme tasks. In this study, participants were better at syllable addition than phoneme addition (52 percent to 41 percent correct) but they were even more successful at syllable deletion than phoneme deletion (70 percent to 47 percent correct). Within each category, participants were better at deleting than adding.

Only one participant, participant 6, answered incorrectly with a meaningful phrase on the syllable addition portion, answering the item /hɪ/ ... /mɪʃ/ first with “how much,” and then answering correctly. During this task, the interpreter noticed that participant 1 repeatedly searched for meaningful words in Somali as she tried to figure out the answer, and reminded her that the words had no meaning. Participant 1 was unable to answer any of the syllable addition items correctly.

Rhyme

The participants did not seem to have any prior knowledge of rhyme, yet they did not do poorly on this task (73 percent correct). They scored similarly to the illiterate subjects in previous studies (Adrian, et. al, 1995; Kurvers, et al., 2006). It seemed that they were learning about rhyme for the first time in the directions portion of this task. Rhyme was explained in English with English examples, and in Somali with Somali examples, yet they struggled with the trial items. Only participants 1 and 2 answered all trial items correctly, but participant 1 went on to answer “no” to all ten test items, giving her a score of five correct out of ten, which is clearly chance-level, so her score is not counted in the total percentage correct above. Two participants scored eight correct out of

ten and one achieved nine correct out of ten. Only eleven errors were made that can be analyzed and of those eleven errors, seven were a semantic pair identified as rhyme. This error pattern is similar to participants in a previous study, who were more able to identify that two rhyming words rhymed than that two semantically-related words did not rhyme (Kurvers, et al., 2006).



*Participant 5 did not perform this task.

** Participant one's chance-level score was not included in the overall percentage correct for this task.

Figure 4.10. Rhyme Test Results by Participant

Phonological and Semantic Fluency

In this section of the test, participants were given two minutes to say all the English words they know which start with the sound /k/ and given one example, cat. Following that, they were given two minutes to say all the English words they know for food and given one example, meat. The results are found below in Table 4.3.

Participants were particularly reluctant to speak and gave up easily and quickly on these two tests. Scores on the semantic fluency test were almost double those of the phonological fluency test, aside from participant 3, whose scores were almost equal on both. This result matches the results of the study by Reis & Castro-Caldas (1997).

On the phonological fluency task, participants were encouraged first to produce English words, but since all but one participant also began to produce Somali words beginning with /k/, these were allowed and counted (after being confirmed by the interpreters to be meaningful Somali words). Only one participant produced a word beginning with a phoneme other than /k/--participant 4 said “green.” This makes sense, since word-initial /g/ is de-voiced in Somali and resembles /k/ (Conway, 2008). This was not counted correct, but noted in (see Table 4.3). One participant produced an incomprehensible word on the phonological fluency task and asked the researcher and interpreter if what she had said was a word in English (noted in table 4.3 as well).

Table 4.3
Phonological and Semantic Fluency Results by Participant, with Totals

Participant	Phonological Fluency	Semantic Fluency
1	0 English 2 Somali	4 English
2	5 English	10 English
3	5 English 2 Somali 1 unclear	6 English 1 slightly related word (kitchen)
4	3 English (1 /g/) 2 Somali	9 English 2 Somali
5	--	--
6	2 English 2 Somali	7 English
Totals	15 English 8 Somali 1 unclear	36 English 2 Somali 1 slightly related word

It is possible that the participants simply didn't know many English words beginning with /k/, but they also were unable to independently produce two of the words from the previous task which began with /k/: cook and kitchen, which they were very likely to have known. Only two participants independently produced the word "come" which had been used on the previous task. Participant 3 said "carrot" and "cabbage" in the semantic fluency test, but had not thought of those words on the phonological fluency test just prior.

In the phonological fluency section, participant 1's first response was to say the example word "cat" in Somali, rather than a word beginning with /k/. She said that this word begins with /k/ in Somali, but it does not. When she couldn't come up with any words, she was given one more example, /kʌm/, because that word had been used in the previous exercise. After this she said, "c'mon boy," several times, and then said two words in Somali which begin with /k/. This may be evidence that this participant lacks a full understanding of word boundaries.

Overall Metaphonological Ability Test Results

Compiling the totals for all participants on each task reveals that the task the participants are best at is Phonemic Identification, which is similar to the results of previous native-language studies where non-literate adults performed well on phonemic discrimination tests (Adrian, et al., 1995; Loureiro, et al., 2004). The total scores fall into the following order:

1. Phoneme identification, 90%
2. Rhyme identification, 73%

3. Syllable deletion, 70%
4. Syllable addition, 52%
5. Phoneme deletion, 47%
6. Phoneme addition, 41%

The information above is also presented in Figure 4.11 below. Like the Somali participants in the Young-Scholten & Strom (2006) study, the participants in this study demonstrated greater awareness of rhyme and onset than syllable, unlike the Vietnamese participants in that study and children in previous studies. In this study, however, the phoneme identification task was really more onset identification than phoneme identification.

It is clear that the participants are better at thinking of semantically-related words than phonologically-related words in their second language. Combining this with the fact that the participants repeatedly searched for a meaningful response in both Somali and English as they attempted the other metaphonological tasks, particularly the phoneme addition task, provides significant evidence that these low-literate adult second-language learners naturally default to focusing on meaning over phonology. The results of this study also support the notion that low-literate adults (as well as non-literate adults) lack a “visuographic dimension” to the processing of oral language (Castro-Caldas, et al., 1998), which would allow them to more easily hold meaningless phonological strings in their short-term memory for manipulation (Adrian et al, 1995).

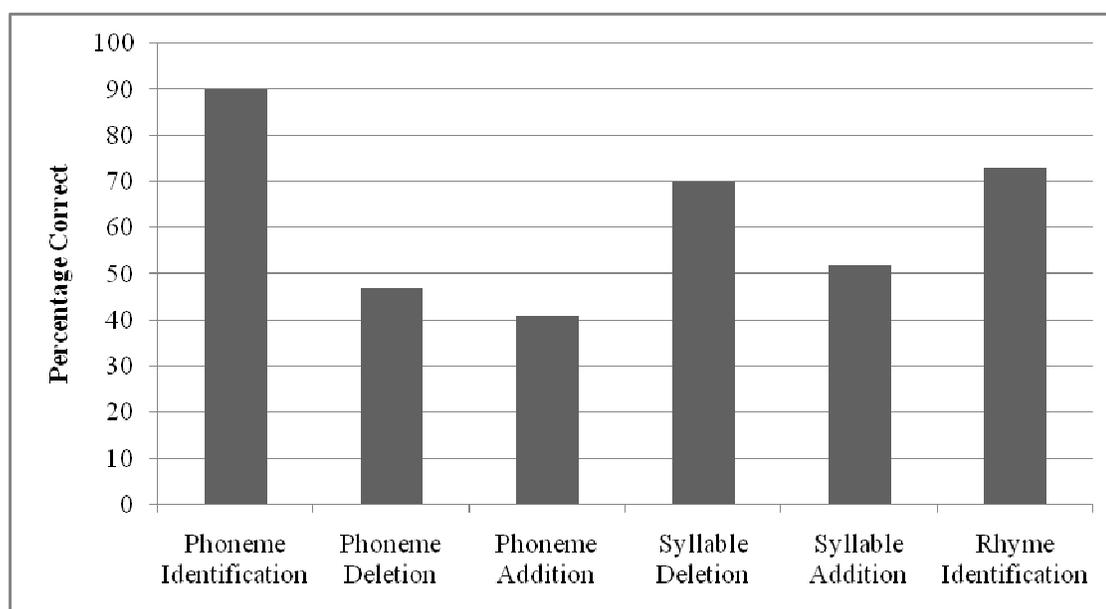


Figure 4.11. Overall Metaphonological Ability Test Results

General Findings and Review of Research Questions

The low-literate adult Somali participants in this study are able to identify word-initial phonemes, but they tend to couple that with a vowel sound. They tend to perceive “sounds” as phoneme + vowel sound. It is questionable, therefore, whether they truly possess phonemic awareness. They are concerned with meaning and they struggle to focus purely on sound rather than meaning.

Research question one: To what extent are low-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables?

The participants in this study are able to identify word-initial phonemes, but they may view the initial sound as phoneme + vowel rather than a pure phoneme. Slightly more than one-third of correct responses included a vowel sound tacked onto the initial phoneme. They are able to add and delete a phoneme from the beginning of a word

slightly less than half the time. They are slightly better at manipulating word-initial syllables.

Research question two: To what extent do they identify rhyme, especially when juxtaposed with semantically-related content?

The participants in this study are able to identify rhyme when specifically taught to listen for it, but they may not have any background experience with rhyme and it is not obvious or easy for them. They identified some semantically-related, non-rhyming pairs of words as rhyming. Even with training in rhyme, semantic connections may still be more obvious than rhyme for them.

Research question three: Will they perform differently on a phonological fluency task than on a semantic fluency task?

The participants in this study are more able to produce words which are semantically-related than phonologically-related.

Effects of Childhood Education

Despite the small number of participants, it is possible to identify some patterns in the data. While it is unclear whether or not there was any effect for age or decoding ability, there does appear to be an effect for length of schooling in childhood. Evidence of this will be analyzed in this section.

The two participants who scored highest overall on the metaphonological ability tests, participant 4 with 50/60 and participant 2 with 46/60, were 28 and 31, respectively. However, the youngest, participant 6, was 22 years old, had lived in the US longer than the other two, and scored only 33/60. Participant 4 had the second lowest English reading

score, did not demonstrate English decoding skills on the English literacy assessment, and only read one out of ten Somali words (the one Somali word that everyone who read at least one Somali word read correctly), whereas participant 6 demonstrated decoding ability on the English literacy assessment (though not on the Somali assessment). These results indicate no apparent effect for age or decoding skills in this study.

All participants had attended school in the U.S. for a similar and short period of time (2 months to 7 months), making it impossible to determine if there is an effect for time in adult ESL classes on their performance. There does appear to be an effect of length of school in childhood. The two who scored the highest also both indicated having attended Qur'an school for five years in childhood. The participant with the next highest score (of those who completed all tasks, i.e., excluding participant 5) attend three years of Qur'an school, as opposed to the two lower scores of participants 1 and 6 who attended Qur'an school for two years and one year, respectively. However, there is very little difference between the scores of participant 3 (37/60) and participant 6 (33/60), though participant 3 had two more years of schooling in childhood than participant 6. There may not be an effect for schooling unless an adult has had more than three years of schooling in childhood, although this sample is too small to be certain of this. These results are presented in Table 4.4 below.

Table 4.4
Overall Metaphonological Ability Test Results by Participant with Number of Years of Childhood Education

Participant	1	2	3	4	5	6
Years of school in childhood	2	5	3	5	2	1
Total score	16/60	46/60	37/60	50/60	17/24	33/60

This is notable for two reasons: The participants in this study can read very little if any in their native language or English, and they do not view themselves as having been educated in childhood. In fact, when asked, they say they did not attend school in childhood, and only mention their Qur'an school attendance when pressed. They do not view themselves as literate in any language.

The percentages of correct responses on the phoneme and syllable addition and deletion tasks in this study are higher than those of non-literate adults in previous native language studies (Morais, et. al, 1979; Morais, et. al., 1986; Read, et al., 1986; Adrian, et al., 1995). This could be partially because of the relatively low number of items in each section. However, each participant in this study had also received some, if very little, literacy training in childhood (in a non-Roman alphabet script), and each were engaged in literacy training at the time of the testing.

Childhood and present L2 literacy training could be one possible explanation for the slightly higher performance of the participants in this study on phoneme and syllable addition and deletion tasks than that of the participants in previous native language studies who were determined to be completely non-literate. The teacher of this class practices initial phoneme identification with the students on a very regular basis, especially when new vocabulary is introduced, and this could contribute to their better performance. The overall phoneme deletion and addition scores are almost the same as the phonological awareness (phoneme tapping, phoneme blending, and adding and deleting phonemes) posttest scores (47 percent correct) of the participants in another

native language study where participants received literacy training during the testing period (Durgunoğlu & Öney, 2002).

It is noteworthy that the participants in this study seemed to be searching for meaning more in the addition tasks than the deletion tasks, which could be one explanation for their lower scores on the addition tasks. The process of decoding is more similar to the addition task than it is to the deletion task. Therefore, it may be that as learners attempt to decode or “sound out” words, they are more focused on searching their lexicon for meaning than they are with simply reading an unknown word based on their knowledge of sound-letter correspondence.

Finally, although comprehension of word boundaries was not measured in this study, two participants provided anecdotal evidence of a lack of understanding of word boundaries which is notable. These occurred in the phonological fluency task, when participant 1 said, “c’mon boy” as a word beginning with /k/ after receiving the prompt “come,” and on the syllable addition task, when participant 6 answered the item /hi/ ... /miʃ/ first with “how much.” It is notable that participants 1 and 6 also scored the lowest on the metaphonological ability tests and had two years and one year of schooling in childhood, respectively.

In this chapter, all data have been presented and analyzed, from the demographic interview, English and Somali literacy assessments, and the metaphonological ability test. The similarities and differences of this study and previous studies have been highlighted and all general findings have been summarized. The following chapter will conclude the

study with a final summary, an explanation of the study's limitations, suggestions for further study, and final comments.

CHAPTER 5—CONCLUSION

This purpose of this study was to answer the following questions: To what extent are non-literate Somali adult English language learners able to identify and manipulate word-initial phonemes and syllables? To what extent do they identify rhyme, especially when juxtaposed with semantically-related content? Will they perform differently on a phonological fluency task than on a semantic fluency task?

In chapter four, all data were analyzed quantitatively and qualitatively. The areas of intersection with the data of previous, similar studies were laid out and patterns in the data were highlighted. This final chapter begins with a short review of the literature reviewed in chapter two, followed by a study summary, an analysis of its limitations as well as the suggestions for further study, and final comments.

Previous Studies

Research from native-language studies with non-literate adults has demonstrated significant differences in metaphonological ability non-literate and literate adults. Non-literate adults are less able than literate adults to add and delete word-initial phonemes (Morais, et al., 1979; Read et al., 1986; Adrian, et al., 1995). They are less able to repeat meaningless words (Reis & Castro-Caldas 1997; Castro-Caldas, et al., 1998; Loureiro, et al., 2004) and even activate different areas of their brains while attempting to do so than

literate adults (Castro-Caldas, et al., 1998; Castro-Caldas, 2004). Second language studies also reveal differences. In their second language, adults with low-literacy fail to integrate function words into speech after hearing grammatical recasts (Tarone & Bigelow, 2006). Their ability to identify syllables, onsets, and rhyme is similar to that of children who have not yet learned to read (Young-Scholten & Strom, 2006).

Study Summary

This study was conducted with six participants, all female Somali ELLs, ages 22-60, from a beginning-level adult ESL classroom in Minnesota. It was a quantitative, one-shot design study with the purpose of revealing the metaphonological ability of low-literate adult Somali ELLs through a series of oral tasks testing their ability to identify word-initial phonemes, add and delete word-initial phonemes and syllables, identify rhyme, and produce phonologically-related words versus semantically-related words.

The participants in this study were able 90 percent of the time to identify word-initial phonemes, but tended to add a vowel sound (one-third of all correct responses) or answer with a letter name (nearly one-fourth of all correct responses). They were much less successful (40—50 percent correct) at adding and deleting word-initial phonemes and adding word-initial syllables, and struggled considerably with these tasks and tended to search for meaningful responses. They were considerably more successful at deleting word-initial syllables (70 percent correct). They were able to identify rhyme (73 percent correct), but they were at times more focused on meaning relations than rhyming. That is, they identified some semantically-related non-rhyming pairs as rhyming pairs. They performed better (twice as many words) on the phonological fluency task than on the

semantic fluency task. The only pattern that clearly emerged from the data was a relationship between length of schooling in childhood and overall performance on the metaphonological ability test.

Implications

Although the participants in this study performed better on some phoneme and syllable addition and deletion tasks than some non-literate adult participants in previous studies, the tasks were not natural or simple for them. They struggled to manipulate meaningless sounds. It appeared that the participants were on a nearly constant search for meaning, that this is their default processing strategy. Therefore teachers should avoid presenting meaningless phonological information, even when the words are very simple. When a teacher says “b, /b/ boy,” be aware that low-literate adult students are not by default thinking phonologically. They may not understand at all.

Because the participants scored similarly to non-literate adults who were also receiving training in literacy and/or phonemic awareness (Gombert, 1994; Durgunoğlu & Öney, 2002), the participants appear to be acquiring phonemic awareness as they gain literacy, (and likely literacy as they gain phonemic awareness since the two have been found to have a reciprocal relationship). Yet their metaphonological ability is still extremely weak. They exhibit heavy reliance on semantics which indicates that any attempt to instruct them devoid of meaning may fail. Non-literate and low-literate students are at times presented with unfamiliar but simple words like “tin, pin, fin, bin,” in order to help them learn to read through phonics. In light of this study, it would seem that the learners would be distracted by their lack of understanding of these low-

frequency simple words. Allowing them to rely on their stronger semantic processing skills may help them learn more efficiently.

The participants' reliance on meaning for language processing supports the use of whole-part-whole literacy teaching method, which focuses learner attention first on meaning, then on the phonemes, onsets, and rimes, then back on meaning. Using the whole-part-whole method has improved both decoding and phonemic awareness specifically on the tasks of identifying initial sound and same sound, and blending (which is similar to the phoneme addition task in this study) with low-literate adult language learners (Trupke, 2007). Using this method specifically focused on onsets and rimes has also improved reading/decoding ability in adult language learners (Evans, 2008).

Given the significant differences discovered between not only literate adults and non-literate adults but even semi-literate adults and non-literate adults, it is clear that as language learners, they need unique attention with classrooms, methods, and materials uniquely designed for them. This has also been found to be true in light of a broad review of all the factors, features, and needs of adults with limited literacy. A recent review of pertinent literature concludes the following: "Within a relatively small body of literature produced over the last four decades about adult ELLs with no print literacy, there is one consistent observation: The instructional needs of these learners are clearly different from those learners with even basic literacy," (Lovrien Schwarz & Bigelow, in press, p. 27).

This study has also informed how I personally will teach low-literate adult ELLs in the future. Non-literate and low-literate adults have language acquisition strengths that SLA researchers have not fully uncovered yet. Many are multi-lingual, and many achieve

astounding verbal English fluency without literacy. They are capable of committing a vast amount of meaningful language to memory. Teachers should teach to the students' strengths first, and then help them build on their weaknesses.

Knowing that low-literate adults struggle to remember meaningless phonological segments, and having experienced them struggling to do so with very small segments, I will be careful to only use meaningful language in literacy instruction and avoid abstract language and topics as much as possible. I will provide phonemic awareness training also with meaningful language only, since this awareness will help them develop literacy, and since this skill has been proven to be something adults can yet acquire.

Adult learners need to learn as much as possible as quickly as possible. When designing meaningful lessons, I will ask myself two questions: *What do they need to know?* The answer to this will be the new words I teach them. And, *What do they already know?* The answer to this will be words that can be used for phonemic awareness training and literacy instruction.

Limitations and Suggestions for Future Research

The implications of this study are limited by its size. The number of participants is small and they are highly homogenous. There were also a fairly small number of items in each task. Future studies should include a greater number and more diverse participants as well as longer tasks.

This study revealed a correlation between length of schooling in childhood and metaphonological ability, but it did not test the participants' literacy level in the language in which they were educated in childhood (Arabic). This limits the revelation of patterns

in the data. In the future, researchers should create literacy tests for every language they discover the participants have been educated in.

Task Design

There are some task items in this study which may have caused some skewing of results. In spite of the attempt to use only English pseudo-words, some words were meaningful, or may have seemed meaningful to the participants. This may have significantly distracted them. In the future it would be best to avoid using any items which sound like English words the students may know. With these items, it becomes impossible to tell if participants are answering correctly, or saying the English word that is close in sound. For example, in the phoneme addition section, there were two words that sounded like meaningful words to students, /sob/ (in the trial section) and /kɛʃ/ (in the test section). On these, it was impossible to tell if they were saying the English words “soap” and “cash,” or simply answering correctly. Most participants answered these items more quickly than others and “correctly,” while they struggled to get any others correct. Further reasons these two items in particular provided unclear results is the tendency of Somali-language speakers to devoice /b/ word-finally, making it often sound like /p/, and the fact that the word “cash” is frequently used even in Somali, so they were more than likely associating the sounds of /k/ ... /ɛʃ/ with “cash.” Pseudo-words which sound like meaningful words in the participants’ native languages should also be avoided.

On phoneme deletion, students generally got /rɛb/ wrong and /fin/ correct. These items should be avoided in future tests like this, as it was difficult even for the researcher

to articulate a pure /r/ and very difficult for participants (apparently) to hear the /ε/. With /fn/, it was impossible to tell if the participants were saying /m/ or just /n/ or the letter “n.”

In the phoneme addition section, the first example was adding /k/ to /æɪn/, which creates the word, “can.” This is a meaningful and fairly high-frequency word, and its use as an example could have caused the participants to begin to focus on meaning. In previous studies (Morais, et al., 1979; Gombert, 1994) words and non-words were used purposefully to determine if participants would respond differently on these items, which they did, performing significantly better with meaningful words. It seems that more transparent results could be obtained from entirely avoiding items that could be perceived as meaningful, to “force a phonological route” (Reis & Castro-Caldas, 1997) and to avoid distracting or confusing the participants who will all too easily start mentally walking down a semantic path.

It may also be revealing for future researchers to vary the order of the tasks. In this study, participants struggled considerably less with the syllable tasks than the phoneme tasks. This may be because syllable tasks are simpler for them, or it may be that the phoneme tasks served as a training period. If syllable tasks are given first in some studies, or if the order is varied within one study, it may provide clarification on this point.

In Young-Scholten & Strom (2006), participants were asked to delete word-initial, word-medial, and word-final phonemes. Future studies should employ this kind of testing to more accurately measure phonemic awareness rather than onset awareness.

The English literacy assessment should contain more simple but low-frequency words to more accurately measure the participants' decoding ability, in order to see how much decoding ability and metaphonological ability correlate. It was possible to determine if the participants in this study were using some decoding in order to read the words, but this would be more obvious with much lower-frequency words.

Many other tasks, such as word and non-word repetition, lexical segmentation, and phonological judgment, performed in previous studies should also be replicated with non-literate and low-literate adult second language learners. It would be very beneficial to perform these tests as pre-tests and post-tests with a period of treatment with various teaching methods as well.

Dissemination

This study may inform teachers in the design of their lessons and research in the design of their study. This study is available to adult ESL teachers and researchers electronically on the Hamline University website as well as in hard copy format in the Hamline Bush library. The school where the research was performed also received a copy, so that teachers of beginning literacy level classes there may benefit from the findings. It has also been added to the ERIC database and the researcher will also seek to publish a condensed version in journals and present the information at conferences.

Final Comments

This study revealed to the researcher, more than anything else, how much more research must be performed with low-literate adult second language learners. It is clear that there are great differences in non-literate and literate adult language learners. Non-literate and low-literate adult language learners do not view language as something to be studied abstractly and parsed into discrete units (Olson, 2002) and they do not possess prior experience in linguistic analysis (Kurvers, et al., 2006). This means doing the sort of research that asks them to perform such tasks is met with some confusion on the participants' part and difficulty. In order to provide the most appropriate and effective teaching methods and language learning materials for them, we must not only perform a great deal more research, but also continue to learn how to most accurately represent the research tasks to participants who have likely never analyzed language in the way they are being asked.

I have visited many beginning literacy level classrooms in Minnesota which were highly multi-level. Very rarely have I seen programs which are actually able to separate non-literate learners from literate learners, and very few teachers have been trained in how to teach non-literate or low-literate adults. The learners grow frustrated quickly and do not improve quickly. It is my great hope that with more research similar to this study and the efforts of the LESLLA forum, policymakers will begin to see the value and necessity of funding classes uniquely designed for non-literate and very low-literate adult language learners, and encourage more appropriate teacher training as well.

APPENDIX A

Demographic Interview

Background Interview

Name: _____ Participant #: _____

1. Where are you from?
2. How old are you?
3. What is your first language?
4. Do you speak other languages? If so, which languages?
5. How long have you been in the US?
6. How long have you been attending school in the US?
7. Did you go to school as a child?
 - 7a. If so, for how many years?
8. Did you learn to read and write in your first language?
 - 8a. If so, who taught you?
9. If not, then did you learn to read and write in a second or third language?
10. In your lifetime, have you relied on reading to help you find things you need in the market, at appointments, while driving reading signs?
11. Did you have books or newspapers in your home?
Did your parents or caregivers read?
Did anyone in your family try to teach you to read?
****If all are "no" skip down to 14
12. How did you feel about reading?
Did you enjoy reading?
What is easy about reading? What is hard?
13. Do you ever make notes to yourself to remember something? How do you do that?
In what language?
14. Can you recognize letters or read simple words in your first or second language?
15. Can you recognize letters or read some words in English?

APPENDIX B

English and Somali Literacy Assessments

English Literacy Assessment

Directions: Students will be given ten seconds to read each word. If the students fail at reading the first five correctly, they will be directed to the letter recognition test below.

1. cat
2. go
3. am
4. no
5. man
6. sun
7. day
8. tall
9. book
10. fish

Letter Recognition Test

1. m
2. b
3. l
4. g
5. a
6. s
7. e
8. y
9. w
10. o

Somali Language Literacy Assessment

Directions: Participants will be given ten seconds to read each word, each typed on a separate blank card *without* the English translation as below. An interpreter will verify their success or failure to read the words accurately.

1. buluug
(blue)

2. cun
(eat)

3. guduud
(red)

4. wiil
(boy)

5. kulayl
(hot)

6. qaboow
(cold)

7. seetahay
(how are you)

8. kaalay
(come here)

9. jaalle
(yellow)

10. gabar
(girl)

APPENDIX C

Metaphonological Ability Tests

Phoneme Identification

Directions: The researcher will ask, with the help of an interpreter, *What sound does _____ begin with?* Participants should answer with a sound, not a letter. Participants will be given three examples then five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given for correct or incorrect answers. In the two-syllable items, the syllable that is bold and underlined is stressed.

Examples: What sound does kil begin with?

Repeat with mir, bɛn

trials:

1. hɪl
2. mɪʃ
3. sɒn
4. ʌ**dɛ**l
5. **bɛ**lə

experiment:

1. gar
2. dal
3. ʌ**kon**
4. ʃʌd
5. ʌ**mei**
6. nʌb
7. læg
8. sæʃ
9. mʌl
10. tog

Phoneme Deletion

Directions: The researcher will ask, with the help of an interpreter, *What do you have if you take _____ away from _____?* Participants will be given three examples then five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given to correct or incorrect answers. All items will request word-initial deletion.

Examples:

What do you have if you take /t/ away from /tɪn/? Answer: /ɪn/

Or, take /t/ away from /tɪn/, what do you have?

Same thing with: gair-g, baʊs-b

trials:

1. nɪl
2. lɑd
3. ʃɑ
4. kɑl
5. hɪg

experiment:

1. nɪʃ
2. rɛb
3. hɑl
4. fɪn
5. ʌkɛf
6. gɪs
7. lɒd
8. ʃɪf
9. ʌmæʊs
10. tʌl

Phoneme Addition

Directions: The researcher will ask, with the help of an interpreter, *What do you have if you add ___ to _____?* Participants will be given three examples then five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given to correct or incorrect answers. All items will request word-initial addition.

Examples:

What do you get if you add /k/ to /æn/? Answer: /kæn/

Repeat with n + ʌg, f + ʌl

trials:

1. mɪn
2. bɒs
3. sɒb
4. ʌlɪg
5. lɛɪn

experiment:

1. nol
2. kair
3. keʃ
4. ʌmæg
5. dæs
6. geb
7. ʌlæs
8. tʌn
9. sol
10. lɛd

Syllable Deletion

Directions: The researcher will ask, with the help of an interpreter, *What do you have if you take___ away from_____?* All task items are two-syllable pseudo-words with the stress on the first syllable. Participants will be given three examples then five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given to correct or incorrect answers. All items will request word-initial deletion.

Examples:

What do you have if you take /ba/ away from /bara/ ? Answer: ra

Same thing with /kepə/-/ke/, /folɪn/-/fo/

trials:

1. mɪ ʃɪn
2. mu ba
3. gɛ ni
4. ke li
5. so da

experiments:

1. ʃɪ mɪn
2. gɛn sɪl
3. lu fa
4. na la
5. dɪ ʃəf

6. ki nə
7. ʃɪ kəl
8. mo lɛg
9. tæ ni
10. lu nə

Syllable Addition

Directions: The researcher will ask, with the help of an interpreter, *What do you have if you add ___ to ___?* All task items are two-syllable pseudo-words with the stress on the first syllable. Participants will be given three examples then five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given to correct or incorrect answers. All items will request word-initial addition.

Examples:

If you add /bo/ to /sa/, what do you have? Answer: bosa

Same thing with /so li/, /ma rɪg/

trials:

1. naʊ mə
2. fu bə
3. nɪ so
4. lʌ kɪʃ
5. gɛ di

experiments:

1. tʌ sa
2. hɪ mɪʃ
3. kæ do
4. lo tɪn
5. ga fə
6. su ni
7. kaʊ ti
8. nei lə
9. ʃɪ nəb
10. ma ko

Rhyme Identification

Directions: The researcher will ask, with the help of an interpreter, *Do ___ and ___ rhyme?* Participants will be given four examples of rhyming and rhyming will be explained in their native language, with four native language examples from the interpreter as well. Then they will be given five trials, in which if they do not answer, the correct response is given. Then, in the ten experimental trials following, no feedback will be given to correct or incorrect answers.

Examples: taim—daim, taim--wen, hat—kold, hat—gat

trials:

1. kæt--hæt
2. mæn--pæn
3. kæt--dag
4. mɪl--sɪl
5. pat--pæn

experiments:

1. go--ʃo
2. sʌn--fʌn
3. kʊk--kɪtʃ^on
4. nu—blu
5. bʊk--kʊk
6. nu—old
7. it--fit
8. go--kʌm
9. it--fud
10. sʌn--mun

Phonological Fluency

Directions: The researcher will ask, with the help of an interpreter, *please say all the English words you know which begin with the sound /k/. Here's an example: /kæt/. You have two minutes.*

Semantic Fluency

Directions: The researcher will ask, with the help of an interpreter, *please say all the English words you know for food. Here's an example: meat. You have two minutes.*

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