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FIRST-TIME L2 READERS: IS THERE A CRITICAL PERIOD?

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1 Introduction

The view in post-industrial countries that immigrants are the main source of economic growth rests on the misguided assumption that the typical immigrant has spoken and written second language skills (see Dustman & Fabbri, 2003).[6,7] That at least literacy skills may not support such growth is suggested by 1990s statistics from the USA which reveal that the education level of 40% of post-compulsory-school age, employable immigrants (i.e. 18-64 year-olds) is primary or lower (Coulombe *et al.*, 2004; Mace-Matluck *et al.*, 1999). Worldwide statistics on literacy show 20 million refugees (Oxford Brookes University Development and Forced Migration Research Unit) and 861 million adults unable to read in their native language or any other language (UN Literacy Decade Project). It is thus unsurprising that this 40% includes adult immigrants without any schooling whatsoever. Do educators and policy makers know what prognosis is for immigrant adults confronted with the challenge of learning to read for the first time in a second language (L2)? While reports from teachers of English as a second language point to the consensus that learning to read is extremely laborious for such individuals, the dearth of empirical studies makes it impossible to know whether unschooled L2 adults have the same potential to become readers as do pre-school children. The answer to this question has important implications: if the evidence indicates the potential exists, then the case can be made for the allocation of sufficient pedagogical resources to support unschooled immigrant adults' development of literacy.

The issue of potential can usefully be considered from a biological perspective, where the relevant question is whether the same sort of 'critical period' exists for learning to read as has been proposed to exist for spoken language acquisition (Lenneberg, 1967).[8] For example, in their discussion of how literacy affects cognitive development, Reis & Castro-Caldas (1997:444) begin with the statement that "if one of

[8] Note that Lenneberg's attempt to connect the end of the critical period with the completion of cerebral lateralization was quickly met with alternative proposals and challenges to this conclusion; see e.g. Seliger (1978) and Krashen (1973), respectively.

the basic skills is not acquired, in the proper moment of the developmental process, the final function will be distorted". It is not unreasonable to entertain the notion that a critical period exists for reading, given the evidence from Reis and Castro-Caldas and others (e.g. Kurvers *et al.*, this volume; Olsen, 2002; Tarone & Bigelow, 2005) that literate and non-literate minds fundamentally differ. This alone does not entail a critical period since learning, by definition, alters the mind/brain.

Evidence for the end of a critical period for the acquisition of spoken language around puberty comes from various sources, including the tragic case of Genie, whose deprivation of linguistic stimuli until nearly age 14 seems to have led to atrophy of the mechanisms responsible for the acquisition of syntax (Fromkin *et al.*, 1974). Research on American Sign Language users whose exposure began in infancy, childhood or adolescence (Newport, 1990) provides further evidence in support of a critical period. In L2 acquisition, large group studies such as Johnson & Newport's (1989) and Patkowski's (1982; 1990) indicate that the critical period also applies to L2 acquisition. Age of closure of the critical period, the role of exposure to the L2, and indeed the existence of a critical vs. sensitive period have been questioned by L2 acquisition researchers (Long, 1990; Moyer, 2004; Flege, 1987 and Bialystok & Hakuta, 1999, respectively). However few contest the observation that native attainment is far more likely for those exposed to an L1 or an L2 before puberty.

Investigation of a critical period for the development of L2 reading is complicated by the age factor in its connection to the development of second language proficiency/linguistic competence, which in turn involves variation in exposure to the target language. VanPatten (1988:251), for example, notes the disadvantage older immigrants may have due to background profiles which limit their interaction with native speakers of the L2. Cause and effect become entangled when one considers how non-literate adult immigrants' inability to access print further limits their exposure to the L2. Fortunately, in exploring whether adults with no experience of interaction with print are capable of learning to read for the first time in an alphabetic script, a straightforward avenue of investigation is possible. We can ask questions similar to those long asked by child reading development researchers.

2   *Research on Children's Early Reading*

In comparison to the vast volume of research on how young children learn to read for the first time in their native language, the evidence base on adults is nearly non-existent, as noted in Comings *et al.* (2003), in Hawkins (2004) and in Ogle (2001). Kurvers (2002, and this volume) is one of the few to investigate with an unschooled immigrant population the same sort of cognitive and linguistic issues as those who study children's reading. More common have been studies addressing the interplay between learners' development of reading in their native language and in their L2. For example, Burtoff's (1985) study of Haitian learners of English showed adults who first learned to read in their native language using the Roman alphabet transferred these skills to English. Robson's (1982) study of the development of English literacy by US Hmong refugees indicated that it is native language alphabetic skills that lead to L2 reading progress and

not education *per se*. (See also Brown & Tavares, 2004.)[9] Research on L2 reading by non-literate adult immigrants has thus far understandably focused on the classroom (Burt *et al.*, 2003; Condelli *et al.* 2003, and this volume; Cunningham Florez, 2003; Huntley, 1992; Shameem *et al.*, 2002) rather than on the internal cognitive processes involved when adults with no schooling attempt to learn to read in an L2.

2.1   Phonological Awareness and the Development of Reading

With mere exposure, few children fail to develop adult linguistic competence in the language to which they are exposed; even exceptional circumstances pose few obstacles (Bishop & Mogford, 1988). Reading not only typically requires instruction for mastery, but it is also not uniformly successful (1% to 10% of all children experience problems, depending on language/writing system; Muter, 2003). While the precise nature of the relationship between these steps remains unclear, findings on the cognitive prerequisites for children's development of reading in an alphabetic script converge on stages of phonological awareness children pass through prior to and during the successful development of reading. Problems at initial stages are a harbinger of later reading difficulties, but these can be successfully addressed by instruction targeting phonological awareness (Rayner *et al.*, 2001).

By at least age three, children begin to develop metalinguistic (or *epilinguistic*; Gombert, 1992) awareness of phonologically defined units of speech. Pre-schoolers can identify and manipulate syllables and sub- or intra-syllabic constituents, and with the development of reading in an alphabetic script, metalinguistic awareness of phonemes emerges (Bryant & Bradley, 1983; Goswami & Bryant, 1990). If a critical period for learning to read does not exist, we should expect to see the same patterns of development for unschooled adult immigrants who have had the opportunity to start learning to read, through participating in English as a second language (ESL) classes.

2.2   Research on Phonological Awareness

Rather than review the sizeable body of research on children's phonological awareness, we limit discussion here to the studies deemed appropriate for replication with an adult immigrant population. This discussion also provides examples of typical studies of young children.

2.2.1   Awareness of 'Word'

As a large phonological unit (relative to the syllable, onset and rhyme), one might expect children's awareness of *word* to emerge earliest. Karmiloff-Smith *et al.* (1996) explored children's sensitivity to this unit in a study involving 48 middle class children in London between the ages of four years ten months and six years five months. Children listened to a story consisting of 'easy' words in which 32 of these were

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[9] The reader may query the omission here of reference to the body of work on children learning to read first time in a second language (some of which cover the issue of late native vs. second language reading). Discussion of this research is, however, beyond the scope of a paper dealing with individuals who have the disadvantage of being both past the age at which the critical period for spoken language is assumed to end (puberty) and beyond the age of compulsory schooling (age 16).

selected as targets and were balanced in phonological composition. The experimenter read the story, and after each of the 32 mid-sentence words, s/he paused and asked "What was the last word I said?" After the child's response, the experimenter backtracked to a natural restarting point and read until after the next target word. Although the children received no information on what was meant by *word*, when also asked "What was the last *thing* I said?" their responses differed, confirming that they knew what *word* meant. Rejecting conclusions from earlier work that children under seven were better on content than function words, Karmiloff-Smith *et al.* found no significant difference between them. Pilot testing demonstrated little word awareness by pre-schoolers (three-year olds performed very poorly) and fully developed awareness for older children (six- to seven-year olds performed at ceiling). The authors concluded that age four is the transition for children's metalinguistic awareness of *word* as an entity. (However, these conclusions must be interpreted cautiously given a recent replication of this study by Kurvers & Uri (2006) that points to poor performance by Dutch and Norwegian 4- and 5-year olds, whose accuracy rate was only 25%).

Table 1:   Young children's awareness of word (Karmiloff-Smith et al., 1996)

Word type	4-year old group	5 year-old group
Function/closed class words	73.70%	95.31%
Content/open class words	76.82%	97.14%

2.1.2   Awareness of Syllable, Onset/Rhyme and Phoneme

Burt *et al.* (1999) looked at units smaller than *word*, i.e. *syllable*, *onset*, *rhyme* and *phoneme*. In their study of 57 normally developing children in Northeast England between the ages of three years and ten months and four years and ten months, the researchers not only rejected social class as a significant factor but also confirmed the order of emergence of phonological awareness observed by numerous others who have shown that children's awareness is of increasingly smaller phonological units. Prior to schooling, the child is aware of the syllable, then of the sub-syllabic units onset and rhyme, and with training in learning to read in an alphabet script, the phoneme. Burt *et al.* measured children's awareness using a range of tests. The results shown in Table 2 represent combined social class scores, confirming the pattern found in studies by others: phonological awareness emerges first for syllables and last for phonemes, with awareness of the sub-syllabic units onset and rhyme a mid-way point. On the basis of theirs and others' studies, Burt *et al.* suggest that prior to schooling onset awareness is less well established than rhyme awareness. Similarly, Burt *et al.* note that others' results on phoneme segmentation are in line with theirs.

Table 2:   Pre-school children's phonological awareness (Burt et al., 1999)

Task	3;10 – 4;3	4;4 - 4;10
Syllable	55.6%	64.9%
Rhyme	39.3%	41.3%
Onset	25.6%	45%
Phoneme	8%	24.9%

Burt *et al.* administered standard tasks to collect their data. A syllable segmentation task involved 12 low-frequency two-, three-, four- and five-syllable words where the child had to tap or clap out the number of syllables. They further included both mono- and multi-syllabic words. An onset and a rhyme awareness task each involved an 'odd-one-out' technique where the child heard a set of several words and had to say which of the four did not match in terms of its initial sound or its rhyme. For both tasks, 12 sets of familiar words were used. Finally, a phoneme segmentation task required the child to listen to 12 individual words and say the individual sounds in each; children found this task very challenging, with no child attaining a score of 100%.

Karmiloff-Smith *et al.*'s and Burt *et al.'s* studies combined point to an order of emergence for phonological awareness (word > syllable > rhyme > onset > phoneme) about which we can ask: are the same patterns found for adult first-time L2 readers? By replicating Karmiloff-Smith *et al.*'s and Burt *et al.*'s phonological awareness tasks, we can refine the question posed in Section 1 above: Do non-literate adult immigrants follow these same developmental patterns of phonological awareness as they grapple with reading in English? First let us take a look at additional, relevant research on reading.

3   Studies of Adults

3.1   Reading

As noted above, the phonological awareness of adult first-time *second language* readers has hardly been probed, but we can extrapolate from Morais *et al.* 's (1979, 1987, 1988) research on Portuguese illiterate adults and similar studies by others (see also Gombert 1994 and Lukatela *et al.,* 1995). Similar to what has been found for children, first-time adult native language readers display only awareness of syllable, onset and rhyme prior to reading/schooling. Phonemic awareness emerges only with instruction in alphabetic script reading or phonemic awareness training. These findings point to the conclusion that emergence of phonemic awareness is dependent on experience rather than on biological, maturational factors. Research further indicates that literacy in an alphabetic script and concomitant phonemic awareness are necessary for transfer of reading skills. An otherwise literate adult learning to read in an alphabetic script for the first time faces some of the same cognitive challenges as the pre-school child. For example, Ben-Dror *et al.* (1995) found that Hebrew speakers/readers were worse than English speakers/readers on phoneme segmentation tasks (graphemes in unpointed Hebrew correspond most often to whole/CV syllables). Similarly, studies of L2 English readers from a logographic script background (Chinese) without exposure to Roman alphabet Pinyin reveal that mere exposure to written English is insufficient for the development of phonemic awareness (Ng, 2000; Read *et al.*, 1986; Su & Huang, 2004). Read *et al.* however, found that early Pinyin exposure without sustained use still enabled Chinese logographic readers to manipulate phonemes comparable to those literate in an alphabetic script.

3.2   Linguistic Competence

We can conclude from the studies of children and adults learning to read in their native languages that with appropriate training, individuals of any age can acquire the phonemic awareness required to support the development of reading in an alphabetic script. This points to absence of a critical period for reading. However, adults learning an L2 and learning to read for the first time in that language face a dual challenge, and that challenge is compounded if the complete acquisition of spoken language is no longer possible, i.e. if there is a critical period for the acquisition of spoken language. Unlike many non-literate adult immigrants, the child will have internalized his/her native language phonology, morphology and syntax and will have acquired a vocabulary of thousands of words prior to starting to learn to read (Gough, Juel & Griffith (1992:36). What level of linguistic competence is necessary to support reading in a second language? The idea of 'linguistic threshold' or 'language threshold' (Alderson, 1984, 2000; Bernhardt & Kamil, 1995; Bernhardt, 2005) addresses the question of how interlanguage competence interacts with native language reading skills to enable the development of a range of L2 reading skills, including comprehension. Earlier work by Cummins (1979) indicates a common L1/L2 cognitive/academic language (CALP) which allows proficient native language readers to straightforwardly transfer their skills to the task of reading in a second language (see also Saville-Troike, 1991). When the L2 learner has no such skills to draw on, the notion of threshold assumes greater importance. Unlike a beginning-level native-language-literate learner who can read L2 text without comprehending it, a non-literate learner at the same level of oral proficiency can do neither. With no L1 metalinguistic skills to transfer and little L2 linguistic competence upon which the development of metalinguistic awareness can 'piggyback' (Gombert, 1992), such a learner is more like a baby than a pre-school child. What then, are the components of the linguistic threshold? While the threshold straightforwardly implicates vocabulary (perhaps due to ease of measurement), Alderson (2000:37) notes that 'the ability to parse syntax into its correct structure appears to be an important element in understanding text', referring to Berman's (1984) earlier work on the effect of complex syntax on written text processing. In addition, work on native-speaking children's reading problems suggest that phonological competence is an important component of the linguistic threshold. Children who fail to form 'stable and highly discriminable representations' of aural input have problems developing phonological awareness and learning to read (Foy & Mann, 2001:319). If a non-literate adult's phonological development is incomplete in the L2, this can be expected to have a similar effect on the development of phonological awareness and reading.

　　Vocabulary has received attention in second language acquisition, including in its relation to reading. However, the focus has primarily been on educated L2 learners (e.g. Laufer, 1992; Nation, 2001). As we shall see, lack of research on adult learners with little or no schooling presents problems for inclusion of vocabulary in any study of their development of reading. This is unfortunate, as vocabulary is a component of the linguistic threshold that seems immune to a critical period. The idea of a critical period for spoken language acquisition of course does not entail failure by adults to make any progress in the acquisition of other aspects of a second language, as is routinely noted by those who address this issue. Controversy regarding the operation of linguistic

mechanisms in the adult L2 acquisition of syntax notwithstanding,[10] research over the last three decades on adults' acquisition of morpho-syntax in a naturalistic context – without L2 instruction - points to post-puberty learners' ability to attain very high and even native levels of competence (e.g. Ioup *et al.*, 1994; Vainikka & Young-Scholten, 2002). In fact, data from the large-scale cross-sectional and longitudinal studies of adult immigrants' oral production discussed in the introductory chapter in this volume were key in arguing that adult L2 learners make use of the same linguistic mechanisms as children do in acquiring language. While many – but not all - of the adult immigrants in the longitudinal studies in Europe and in the USA failed to attain high levels of oral proficiency, this may have been due to limited L2 exposure (VanPatten, 1988; Moyer, 2004). Relevant to the present study is not whether it is possible for an adult to attain native-like competence in an L2, but rather the extent of morpho-syntactic competence necessary to support a non-literate adult's reading development in a second language.

Research also shows that while a second language learner's native language exerts a strong influence, particularly at the early stages, with sufficient input from native L2 speakers, even post-puberty learners can develop high levels of phonological competence in their L2 (Major, 2001; Moyer, 2004). The problems less successful learners have are with those very aspects of phonology the awareness of which precedes and accompanies learning to read, namely with the consonant clusters that constitute complex onsets and rhymes and with new phonemic distinctions (Young-Scholten & Archibald, 2000; Brown, 1993, respectively).

4   The Study

Bearing in mind discussion of the two studies of children in Section 2.2. above, we now turn to a study of the reading ability, phonological awareness, and linguistic competence of adult immigrants learning English. Pre-school children succeed on word, syllable and sub-syllabic awareness tasks, but it is not until after a year or two of schooling - when they begin to read - that they score well on phonemic awareness tasks. This leads to the prediction that adults with little or no schooling will score well on phonemic awareness tests only once they have had comparable reading instruction *and* if they demonstrate the ability to read. When it comes to the interaction of linguistic competence with the development of phonological awareness and reading by non-literate adults, no directly relevant studies exist. On the one hand, the studies by Morais and colleagues discussed in Section 3.1 involve adults not literate in their *native* language. On the other hand, Alderson's linguistic threshold introduced in Section 3.2 refers to *educated* adults who are in the process of developing linguistic competence in a second language.

4.1   Subjects

Immigrants with no schooling come from a variety of language backgrounds and live in a variety of countries, but we selected Somali and Vietnamese adults learning English due to their representation among 'literacy-level' learners in Seattle, where we had the resources to carry out the study. Somali and Vietnamese both use the Roman alphabet, with additional diacritics. Because we decided to include in our sample learners with

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[10] See e.g. White (1989).

some primary schooling, the shared alphabet is fortuitous given the likelihood that any schooling in an alphabetic script will have led to phonemic awareness and thus the expectation that phonemic awareness and any associated reading skills will transfer.

Table 3 shows a sample including 17 adults with a range of native language (NL) schooling, length of residence (LoR) and ESL instruction. Eight of the 17 experienced no native language schooling, while the other 11 were attending school from one to five years. Two of the Vietnamese learners experienced schooling in Chinese (which they also spoke), where a logographic rather than alphabetic script was involved. Of these two learners, V2 attended an exclusively Chinese-medium school. If prior schooling in native language confers an advantage in the learner's development of phonemic awareness only when an alphabetic script is involved, we might expect V2 to pattern similarly to the learners without any schooling, rather than to the learners with some schooling in Vietnamese or Somali.[11] All but one of the 17 had native language (NL)- or English-literate children, siblings or partners.

Table 3:   The learners

	Sex	Age at testing	NL schooling prior to immigration	ESL instruction	Length of US residence
S3	M	30	0 yrs	2 wks	2 yrs
V1	F	51	0 yrs	1 yr	20 yrs
V6	F	70	0 yrs	1 yr	2.5 yrs
S8	F	31	0 yrs	4 mns	9 yrs
S9	F	54	0 yrs	1 yr	4 yrs
S10	F	66	0 yrs	1.5 yrs	3 yrs
S2	F	47	0 yrs	2 yrs	5 yrs
S4	F	38	0 yrs	3 yrs	9 yrs
S6	F	24	2 yrs	1 yr	2 yrs
S5	F	32	2 yrs	1 yr	2 yrs
V2	F	64	2 yrs (Chinese)	2 yrs	8 yrs
V4	F	43	3 yrs	0.5 yr	13 yrs
V3	F	31	3 yrs	4 yrs	12 yrs
S1	M	26	4 yrs	none	1 yr
V5	M	34	4 yrs+1 yr (Chinese)	0.5 yr	0.75 yr
V7	M	53	5 yrs	0.5 yr	3 yrs
S7	F	30	5 yrs	1.5 yrs	9 yrs

Somali and Vietnamese also share several linguistic characteristics (for Somali see Heine & Nurse, 2000; for Vietnamese Hoa, 1965). Neither allows consonant clusters (Vietnamese orthography can obscure this fact: <tr> is not a cluster, but a voiceless stop), and both allow final singletons. Somali has geminates and allows medial consonant sequences. Lexical tone exists in both, but is pervasive in Vietnamese where words are also primarily monosyllabic. Syntactically, Somali is a consistently head-final language, while Vietnamese is head-initial.

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[11] V2 may well have been exposed to Pinyin in its role in kick starting the learning of Chinese characters. In this respect, she would be similar to those studied by Read *et al.* (1986) who exhibited phonemic awareness even after years of non-use of Pinyin.

4.2   The Test Battery

Table 4 provides an overview of the tasks in our battery. To measure reading and
writing skills, we used a combination of tests designed for this adult population. For
phonological awareness testing, we drew on the two studies described in Section 2.2,
and together with bilingual interpreters, we created Somali and Vietnamese versions of
these tests. To measure linguistic competence, we relied on procedures commonly used
to elicit production data.

Table 4:   The test battery

	Tasks in native language	Tasks in English

Literacy	- read part of a story
	- write personal details
	  (to confirm schooling)
		- read 12 varied single letter
		  identification
		- read 4 survival signs
		- fill in 6 blanks (multiple choice)
		- read a paragraph
		- read 10 isolated words from spoken
		  lexicon
		- write personal details

Awareness	- word: repeat 25 words in a story
	- syllable: count syllables of 21 words
	          Somali: salomonka
	- rhyme: 12 sets odd-one-out
	          Somali: albaab hab <u>dam</u> anab
	- onset/alliteration:
	          12 sets odd-one-out
	          Vietnamese: danh dung do <u>cao</u>
	- phoneme: 12 words segment removal
	   Somali:
	   first sound: <u>sh</u>ay ay
	   last sound: kari<u>n</u> kari
	   middle: al<u>b</u>aab alaab
		- word: repeat 25 words in a story
		- syllable: count syllables of 21 words
		          English: supermarket
		- rhyme: 12 sets odd-one-out
		          English: car jar <u>fan</u> star
		- onset/alliteration:
		          12 sets odd-one-out
		          English: cage cup <u>sun</u> cow
		- phoneme: 12 words segment removal
		   English:
		   first sound: <u>b</u>room-room
		   last sound: for<u>k</u> - for
		   middle sound: f<u>r</u>og fog

Linguistic competence		- morpho-syntax
		          describe a photograph (of an
		          accident) for five minutes
		- syllables: name 19 depicted objects
		          (10 w/onset and 11 w/coda
		          clusters)
		- segments: name objects in a set of 16
		          pictures with non-NL
		          contrasts

4.2.1.   Tests and Testing Procedures

With the exception of the reading tests, testing was entirely aural/oral, with the
assistance of a bilingual interpreter. S/he also interpreted the participation agreement
and the background information questionnaire, which yielded the information shown in

Table 3. After collecting this information, we next sought to determine whether the learner could actually read or write in Somali/Vietnamese by asking her/him to read the first few lines of the story used for the word awareness task, and then to write basic personal details and if possible a bit more about life in Seattle. The English reading component, which was administered last, comprised a set of tests adapted from other tests to measure a range of basic reading sub-skills. From the Woodcock Johnson Revised (1989) test, we borrowed the idea of presenting letters of the alphabet unordered and in different fonts. We slightly adapted the ESL BEST Form B to test learners' survival sign/environmental print reading. From the Spokane Community Colleges ESL Literacy Level assessment, we adopted a fill-in-the-blank multiple choice sentence completion task. For paragraph reading, we used the English version of the word awareness story. To assess decoding skills, we asked learners to read a list of ten high and low-frequency mono- and multi-syllabic words they would have been exposed to in their daily lives, ranging from high frequency words such as *table* and *community* to lower frequency (but nonetheless survival words) such *penicillin*. Lower-frequency words were included based on the assumption that these would not be part of low-literacy ESL students' sight word repertoires and would therefore reveal whether learners possessed decoding skills. Reading comprehension was not measured given our focus on phonological awareness and basic reading skills.

After the native language reading/writing test, the interpreters assisted in the administration of the native language versions of the phonological awareness tasks. Carrying out the first half of the test battery in the learner's native language not only reduced the learner's anxiety, but also increased the learner's grasp of the testing procedures. Several additional factors were considered in the administration of these tasks, the most central of which was time. Three hours was the most these adults could spare, and token number was adjusted accordingly on those tasks we anticipated would be time-consuming. Next administered were the English phonological awareness tests, identical versions of which learners had just taken in their native languages. For the word awareness task, we did not use Karmiloff-Smith *et al.*'s (1996) original story, but rather constructed a story using topics familiar to adult immigrants in Seattle, with simple syntax, a restricted lexicon and slightly fewer target words. As noted in Section 2.2., they found no significant difference between children's successful repetition of content vs. function words. However, roughly half of the words in this test (14 of the 25 for the English version) were function words due to the expectation that the linguistic competence of some of the adults in our study might be at stages where functional morphology is absent or sparse. 25 pauses were inserted after every 15th to 20th word, after which the experimenter asked the learner to repeat the last word s/he had read.

The syllable counting task involved 21 two-, three- four- and five-syllable words in the English and Somali versions (no Vietnamese version was used due to the mono-syllabic nature of Vietnamese words). In both versions, these were actual words, and in the English version, nine of these were high frequency, familiar words such as *supermarket*, and 12 were low frequency words such as *magnitude* and *chaos* (therefore treated by learners as nonsense words).

The English versions of the rhyme and onset 'odd-one-out' tasks and the phoneme deletion/segment removal task used the same 12 sets of words Burt *et al.* used. For the rhymes, all four words in each set were mono-syllabic with VC or V rhymes. For the onsets, eight of these sets involved mono-syllabic words, two sets used words with two syllables and two sets words with three syllables. The words were those high frequency

words assumed to be in the lexicon of three- to five-year-olds. Although this assumption might not hold for our adult sample, we found no alternative but to use the same words given the lack of a ready description of the words the typical low- literate/low-level adult L2 learner knows. The phoneme deletion task involved four words with coda clusters from which learners had to remove the final segment to create a real word and eight words with onset clusters, from half of which the first segment could be removed to create an actual word and half of which the second segment could be removed to create a word. These words were not from Burt *et al.*; we chose these based on the parameters that both the original and the created words were real, high-frequency words.

Morpho-syntax data were obtained using a now standard technique to elicit spontaneous oral production: picture description. The phonology tasks also involved pictures where only naming was required. As is common in the study of L2 phonology (Young-Scholten & Archibald, 2000), we elicited oral production for onset and coda data. Although we also administered a picture pointing task to measure these adults' ability to aurally discriminate phonemes, the validity of results from this task is questionable. To demonstrate their ability to discriminate between /p/ and /b/ (a distinction non-existent in Somali and Vietnamese), learners had to point to a picture of a *cop* in an array that showed a policeman along with a corn *cob* and a distracter. In administering the test, it was evident that learners did not know these words or indeed a good many of the nouns which were used in this minimal pair discrimination task. We were therefore forced to rely only on the production task to draw conclusions about phonological competence.

4.3.   Data Analysis

Before discussing our results, we detail our data analysis where it differs from Karmiloff-Smith *et al.*/Burt *et al*. Reading can be seen to develop in stages (Ehri, 1994).

4.3.1.   Reading Levels/Stages

Table 5 :   Reading level scoring, based on % correct on English reading tests

Level	Varied single letter identification	Survival signs	Fill-in-blanks	Paragraph reading	Decoding of familiar words in isolation
1	75% +	25%+	0%	no ability	0%
2	75% +	75%+	20%	attempt, w/guessing	20%+
3	100%	100%	20%	slow, sometimes accurate	20%+
4	100%	100%	80%+	halting, mostly accurate	60%+
5	100%	100%	100%	fluent	100%

Based on their performance on the five reading sub-tests for English shown in Table 4, we placed each learner at the implicational reading levels or stages shown in Table 5. All learners scored highly on varied single letter identification; scores below 100% were due to native-language-phonology-based confusion of <p> and <b>. Next-highest scoring

was the survival/environmental sign task, followed by fill-in-the-blanks, paragraph reading and finally, decoding. We assumed that when a learner scored 100% in decoding, s/he was drawing on sight word knowledge, guessing from context and using emerging or transferred decoding skills to tackle the fill-in-the-blanks and paragraph reading tasks.

4.3.2   L2 Linguistic Competence

Dating back to Brown (1973) for L1 acquisition and to Bailey *et al.* (1974) for L2 acquisition is the idea that inflectional morphemes emerge in a predictable order, as shown by learners' oral production in obligatory contexts. Subsequent studies have pointed to the need to consider the overall production of functional morphology and, more importantly, the associated syntax. Disagreement on details notwithstanding (see White, 2003), there is a general consensus that adult L2 learners' non-target morpho-syntax is systematic. A range of studies on the acquisition of English and related languages supports the order of emergence of inflectional morphology and syntax (regardless of learner's exposure type, education, background and to a great extent, native language (Hawkins, 2001; Young-Scholten, Ijuin & Vainikka, 2005). The five Organic Grammar stages (starting with a stage where the L1 exerts its only influence) in Table 6 translate into five proficiency levels at which we placed the learners of our study.[12]

Table 6:   Organic Grammar stages (= levels) of morpho-syntactic development in English

Level	Word order in declaratives	Types of verbs	Agreement and tense	Pronouns	Questions and clauses
1	L1 word order	thematic verbs only	none	absent	None
2	L2 word order	copula 'is' appears	none	some pronouns	Qs formulaic or intonation
3	L2 word order	copula forms beyond 'is'; modals emerge	none	new forms; but not obligatory	Qs w/o inversion; coordination
4	L2 word order	auxiliary 'be' forms emerge	tense, aspect; agreement for 'be' forms	pronouns obligatory, and 'it' 'there' emerge	Qs may lack inversion; simple subordination
5	L2 word order	all complex	additional forms; passive forms	'it' and 'there' productive	inverted Qs; complex subordination

To provide data for their placement at one of the levels shown in Table 6, learners were required to talk for five minutes about a photograph which showed a bystander and a stopped car, its driver looking down at an unconscious boy lying on the ground with his bicycle. As shown in (1), this picture prompt served to elicit a range of

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[12]The idea of such implicational stages is similar to Crystal *et al.*'s (1976) and Scarborough's (1990) in first language acquisition, and to Pienemann *et al.*'s (1988) in second language acquisition.

constructions. Learners who produced only single-word utterances were placed at Level 1. Their spontaneous utterances during the two or more hours the experimenter spent with them confirmed the conclusion that they were at this level or below. It is possible that given more time and a more relaxed, communicative setting, they would have produced two-word utterances with both nouns and verbs as well as longer utterances; we suspect the former would demonstrate native language declarative word order and the latter the formulaic chunks discussed in Myles (2005).

(1)

Stage 1:	L1 order/thematic verbs	Car. Bicycle. One boy.
Stage 2:	Thematic verbs; copula *is*	You my car hit here teacher. This is car.
Stage 3:	New functional morphology coordination	The woman is cry. Someone's die because he have accident.
Stage 4:	Subordination emerges	Car hit the kid that's lie down on the street.
Stage 5:	Nearly target-like	The young boy was having fun with his bike. He doesn't did that.

In our study, the assessment of phonological competence in an L2 involved the straightforward comparison of the learner's production of non-target onsets, codas and segments with required target language forms. With respect to vocabulary, we were unaware of an appropriate test. We attempted to test vocabulary, given Alderson's (2000) observation that a 5,000-word vocabulary is required for basic reading – whether in an L1 or an L2. Standardized instruments that do not require reading such as the native-speaker-validated Peabody Picture Vocabulary Test are unlikely to accurately tap the word knowledge of immigrant adults. On the other hand, tests designed to measure adult L2 learners' vocabulary typically assume secondary education and are in written form. We opted to administer the lowest level of Meara's (1992) instrument to determine whether our learners had a core vocabulary of 2,000 words required for understanding what is heard/read in predictable situations. Unfortunately, two necessary alterations made in the instrument - shortening and oral administration - rendered the results invalid.

5   Results

5.1   Overall Individual Performance

Table 7 repeats in a more condensed form the background information on the learners in the study (cf. Table 3), again arranged by amount of native language (NL) schooling, showing these individuals' ESL participation and length of US residence (LoR) together with their performance on selected components of the test battery. The eight learners without any native language schooling are followed by V2, whose exposure during schooling was only to logographic Chinese. Scores only on the English language test

versions are given here. For the unschooled learners, performance on the Somali / Vietnamese versions of the tasks was highly variable and often worse than their performance on the English language versions, suggesting that they were still grappling with understanding the testing procedures at the start of the testing session. The schooled learners' performance on the native language versions of the tasks was, however, comparable to their performance on the English language versions.

In addition to showing learners' performance only on the English language task versions, scores from some of the tasks have also been combined. The 'phonology' column in Table 7 shows learners' performance on the onset, coda and segment production task combined. A breakdown of their scores shows that the Vietnamese were worse overall in producing both initial and final consonant clusters. They produced target complex onsets 47% of the time, while the Somalis did so 85% of the time. Echoing others' findings (see Young-Scholten & Archibald, 2000), both groups were far better at producing onsets than codas, where Somalis produced codas 51% in a target-like manner but the Vietnamese learners only did so 5% of the time. The 'awareness' column in the table also presents combined scores for the English syllable, rhyme and onset awareness tasks under 'syll'. Scores across the three sub-tasks did not differ appreciably, but where they did – on the phoneme/segment awareness task – these are presented in a separate column ('seg').

Table 7: Overview of learner profile and performance on subtests

	sex/ age	NL school	Years ESL/ LoR *)	Phonology (% target)	Syntax Level	Awareness % correct		Reading level
						Syll	seg	
V1	F 51	0 yrs	1/20	29%	2	51%	0%	1
V6	F 70	0 yrs	0.5/2.5	3%	1	34%	17%	1
S8	F 31	0 yrs	0.33/9	69%	2	61%	8%	1
S9	F 54	0 yrs	0.25/4	56%	2	56%	17%	1
S10	F 66	0 yrs	1.5/3	63%	2	37%	0%	1
S2	F 47	0 yrs	2/5	54%	1	20%	16%	1
S4	F 38	0 yrs	3/9	81%	2	36%	0%	2
S3	M 30	0 yrs	2 wks/2	71%	5	68%	42%	4
V2	F 64	2 Ch.	2/8	25%	1	50%	17%	3
S6	F 24	2 yrs	1/2	76%	2	55%	67%	2
S5	F 32	2 yrs	1/2	63%	1	58%	25%	3
V4	F 43	3 yrs	0.5/13	66%	2	44%	17%	3
V3	F 31	3 yrs	4/12	45%	5	77%	58%	4
S1	M 26	4 yrs	0/1	80%	5	97%	100%	5
V5	M 34	5 yrs	0.5/0.75	50%	1	57%	25%	3
V7	M 53	5 yrs	.5/3	25%	1	73%	50%	3
S7	F 30	5 yrs	1.5/9	73%	3	65%	25%	3

*) LoR = Length of residence in US

ESL course participation – which varies considerably for this group - does not appear to be connected with variation in learners' test performance (although without information on content of instruction and actual hours and regularity of attendance, we

cannot dismiss the possibility of a relationship between ESL participation and achievement; see Condelli, this volume). The table shows that Low Syntax Level scores (1 or 2) are exhibited by all the learners with the lowest Reading Level scores (1 or 2), as well as by seven of the eight unschooled learners. Anecdotal evidence from ESL teachers indicates a population of adult learners who are able to communicate effectively yet who are unable to read. If this is indeed so, learners' oral fluency may well be the result of their high use of memorized chunks and stock phrases (Myles, 2005) and a communication system along the lines of Klein & Perdue's (1997) Basic Variety which masks a morpho-syntactic competence that is simply too low to support the development of reading. The achievements of the 30-year old Somali male (S3), the one unschooled learner with a much higher Reading Level - '4' – can be seen as a consequence of his '5' Syntax Level. His score of 71% on phonological competence measures, 68% on syllable/onset/rhyme awareness tasks and 42% on the segmental awareness task after only two weeks' ESL participation (occurring immediately before he was tested) points to a highly motivated, naturalistic learner of the sort of that certainly ought to be studied in greater numbers.

Table 7 shows that the sole Level 1 readers in the group were those without any schooling, and that their 'seg' awareness is always inferior to their 'syll' awareness, as is the case for nearly all others learners. While Syntax Level and Reading Level scores are on par for the unschooled learners, five of the learners with some native language schooling have lower Syntax Levels than Reading Levels (V2; S5; V4; V5 and V7). This indicates the threshold for morpho-syntactic competence is lower for those who have at least some alphabetic reading skills to transfer. Contrary to predictions based on her schooling in a logographic rather than alphabetic script, V2 does not pattern with the unschooled learners: she is at Level 1 in her morpho-syntactic development, but at Level 3 in reading. However, a reading level of '3' does not indicate she is able to decode, and her score of 17% on segmental awareness task supports the conclusion that she does not possess phonemic awareness. Her schooling appears to have benefited her only to the extent that she understands the process of reading.

5.2   Phonological Awareness Sub-tests

The learners in our sample might have been expected to perform better on the native language versions of the sub-tests, but this was not the case. As noted above, native language vs. English language performance revealed no clear trends. Moreover, superior performance in one language vs. the other could not be traced to amount of native language schooling or to ESL classes. Certainly some of the variation observed might be accounted for by individual learners' exposure to specific classroom training in English or in their native language, but we have no information on the actual details of learners' classroom experiences. As already noted, a testing order where administration of the native language versions preceded the English versions seemed to contribute to better performance on the latter, particularly for those less familiar with meta-linguistic tasks, i.e. the unschooled learners.

5.3   Adults' Development of Phonological Awareness

Looking first at the word awareness task performance, our learners' scores suggest adult second language learners are operating differently from children: all seven Vietnamese

learners correctly repeated the 11 content words more often than the 14 function words in the task (83% for content words vs. 58% for function words). Seven of the ten Somali learners also followed this trend, with three (S7, S8 and S9) repeating function words more often than content words. Similar to the overall trends noted above, this variation appears to be unrelated to native language and ESL schooling or to reading level and linguistic competence.

Figure 1 shows how our adults compare to children (see Tables 1 and 2 above), in terms of mean scores from each phonological awareness task, from Karmiloff-Smith *et al.* for *word* (function/content words combined) and from Burt *et al.* for *syllable*, *onset*, *rhyme* and *phoneme* (segment). While there are some differences worth pursuing in future research (the Somalis' superior onset/rhyme vs. syllable awareness), the overall pattern of lagging phonemic awareness and superior word awareness is similar to children's.
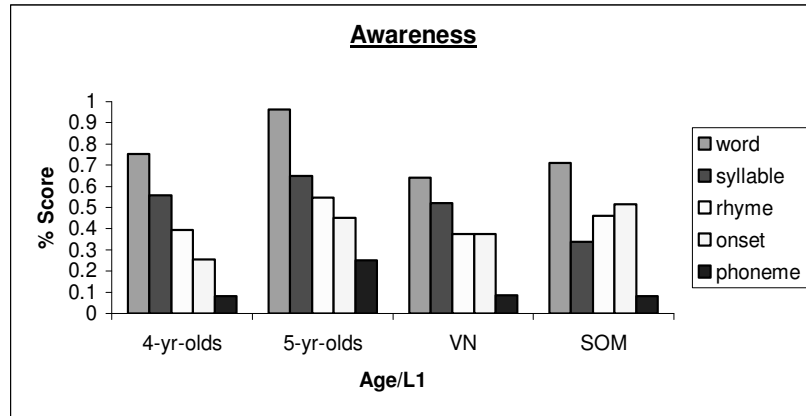

Figure 1:   Adult L2 learners in comparison to Karmiloff-Smith et al. and Burt et al.'s children

5.4.   *Relationships between Sub-test Scores*

Here we further explore relationships between factors discussed above. When we look for correlations between phonemic awareness with isolated word reading (see Table 8), we indeed find a relationship similar to that found for children (Goswami & Bryant, 1990).

Table 8:   Phonemic awareness and single word decoding scores (Pearson correlations)

Learners	Correlation	
Vietnamese	0.915	p <.01
Somalis	0.881	p <.01
Overall	0.886	p <.01

Onset/rhyme awareness scores and decoding (single word reading) show slightly weaker correlations, but these are nonetheless significant (see Table 9). As discussed in Section 2, this is expected if onset/rhyme awareness emerges naturally, where all individuals regardless of additional, phonemic awareness display the former, and all those who demonstrate the ability to read have both onset/rhyme and phonemic awareness.

Table 9:   Rime/onset awareness and single word decoding (Pearson correlations)

Learners	Correlation	
Vietnamese	0.711	p<.05
Somalis	0.746	p<.05
Overall	0.720	p<.01

Table 10 addresses one component of the linguistic threshold, namely, phonological competence. The correlation between onset/coda production and onset/rhyme awareness is significant for the Somalis but not for the Vietnamese (whose numbers are, in any case, lower at seven learners vs. ten learners). A problem not mentioned earlier is the likelihood that the production task and awareness tasks did not measure precisely the same units. The production task looked at final consonant clusters, i.e. only the syllable coda. However, the rhyme awareness task tapped learners' awareness of the entire syllable rhyme, including the vowel(s) preceding final consonants. The need to treat rhyme and coda production and awareness separately is yet another issue for future consideration by researchers.

Table 10:   Onset/coda production and onset/rime awareness (Pearson correlations)

Learners	Correlation	
Vietnamese	0.538	Ns
Somalis	0.703	p<.05
overall	0.537	p<.05

Looking at the morpho-syntax competence that might be required as a foundation for understanding the phrases and clauses in a text and its relation to reading skills, the correlation calculated between Syntax Level and Reading Level was significant for the Somalis, but not for the Vietnamese, as shown in Table 11. Note that six of the eight unschooled learners were Somalis. In the discussion of the results shown in Table 7, it emerged that the unschooled and schooled learners constitute two separate populations, where Syntax Level only matters for the former, when there are no native language reading skills available to transfer.

Table 11:   Syntax level and reading level (Spearman correlations)

Learners	Correlation	
Vietnamese	0.714	ns
Somalis	0.915	p <.01
Overall	0.942	p <.00

6   Discussion

The results from this small-scale study reveal phonological awareness profiles of low-literate adult readers that are similar to young children's, as well as to the older late-literate native language speaking adults studied by Morais and colleagues. As has been found for children and for late native language readers, there is compelling evidence for the emergence of word, syllable, rhyme and onset awareness prior to the development of reading, and for the emergence of phonemic awareness only with reading. As we have seen, none of the 17 adults in this study demonstrates the ability to read – specifically, to decode - without also displaying phonemic awareness, and none of them display phonemic awareness without also demonstrating the ability to decode. The one learner with only logographic script schooling demonstrates a greater ability to cope with written text than most of the unschooled learners (with a Reading Level of '3'); however, she is also unable to decode and has extremely limited phonemic awareness. For those who immigrated to the USA with some native language schooling, awareness of all five phonological units was likely the result of this schooling, especially since it was in an alphabetic orthography. The variable bidirectional nature of linguistic competence level/score and Reading Level shown in Table 7 for these learners suggests variability in transfer of native language reading skills. Apart from the short native language reading passage learners read to confirm basic native language reading ability, we lack the detailed information on our schooled learners' reading skills and on their schooling that might well account for this variability.

For those adults in the group who provide a direct comparison with young children - the eight unschooled learners - it is not clear to what extent the phonological awareness patterns found are the result of ESL course participation, since all had attended ESL classes for between two weeks and three years. However, it is highly unlikely that all learners were receiving ESL instruction that solely focused on the supra-phonemic units that most of them only displayed awareness of. Morpho-syntactic competence (Syntax Level) turns out to be most clearly connected to unschooled learners' ability to read. And while we find significant correlations between onset/coda production and onset/rhyme awareness, we have noted above one problem with these results. An additional problem is that the production data upon which we have based conclusions regarding learners' phonological competence may under-represent their competence; a comprehension task would reveal whether learners perceive phonemes they cannot produce.[13] However, as also noted above, it is impossible to construct comprehension tasks for low-level learners whose lexicons are limited (this is not a problem confronting those who work with native-language speaking children). As we have seen, the current state of research on low-literate adult second language learners does not provide many options for the testing of vocabulary in the first place. A measure of these learners' vocabularies would have completed the picture of their linguistic competence to allow comprehensive consideration of the linguistic threshold for L2 reading. As with several other issues already mentioned, this, too must await future research.

We can have confidence in our results to the extent that - despite some problems in data collection and interpretation - they resemble what has been found for children

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[13] The same might be pointed out with respect to the determination of morpho-syntactic competence.

with respect to phonological awareness. The study has also uncovered several ways in which adults appear to differ from the children who have been studied. First, our adult learners patterned differently from children in their repetition of words: they repeated function words at a lower frequency than content words. This is unsurprising when one considers that a low Syntax Level means function words are absent from learners' L2 grammars. That this pattern also held for learners at the highest ('4' and '5') Syntax Levels suggests lack of a straightforward relationship between acquisition of functional elements and the ability to isolate and repeat them from the stream of speech. Our results also show different patterns of awareness for smaller units. With respect to syllables vs. onsets and rhymes, unlike children, the Somali adults demonstrate greater awareness of the latter. In fact, the Vietnamese learners demonstrate greater syllable awareness than the Somalis, an unexpected result given the monosyllabic vs. polysyllabic nature of the two languages. This pattern does not hold for every individual Vietnamese or Somali speaker, indicating additional factors at work, the simplest of which is learners' ability to grasp the demands of a task. A final difference between children and our adult learners is the relationship between alphabet knowledge and reading. Barron (1991, 1994) claims that alphabet letter knowledge rather than decoding ability is what triggers phonemic awareness. Although phonemic awareness exists for those learners in our sample who both know the alphabet and who can decode, we find little evidence for any sort of triggering effect. All 17 adults demonstrated solid knowledge of the alphabet in their ability to read letters in different fonts and out of order, but as we have seen, many demonstrated no phonemic awareness and no decoding ability.

7   Conclusion

Is there a critical period for learning to read? The findings from this small-scale study clearly indicate unschooled adults are fundamentally similar to preschool children in this respect. Indeed it would be odd if the unschooled learners in our sample displayed patterns of awareness and reading skills different from those late literate native language adults studied by Morais and colleagues. Given our conclusion, it is not surprising that one of the eight unschooled adults in our sample had learned to read/decode (S3). It is surprising that he was able to do so without the support of ESL classes. With the rest of his family literate in Somali and/or English, he would have understood what literacy entails and may have been motivated to seek out willing teachers in his family and community.

Adult second language learners do differ from native speaking adults learning to read for the first time. If they have not mastered the phonology, morphology and syntax of their second language when they begin to learn to read, their ability to develop phonological awareness and to decipher text will be compromised. Future research will need to determine precisely how development of these aspects of spoken language – as well as vocabulary – relates to the development of meta-linguistic awareness and reading. It is not clear that the critical period for language acquisition is a contributing factor. S3 clearly developed sufficient linguistic competence to support reading. One might be tempted to conclude that the critical period for acquisition of spoken language accounts for the slow linguistic progress of the rest of the unschooled adults, yet limited exposure to English is a far more likely cause (Moyer 2004).

To examine the factors we have considered in more depth, a longitudinal study is required, where phonological awareness is tested in both languages prior to and during reading instruction. Such a study would allow the more rigorous examination of the relationship between various components of linguistic competence and reading.

As is the case for young children, the development of literacy in English by first-time adult readers requires considerable resources. Learning to read is not the only challenge facing low-literate adult immigrants. Many adults with no formal schooling are refugees from war-torn, non-industrialized societies who upon arrival in the USA must juggle ESL classes with family responsibilities and work. Our study of 17 Vietnamese and Somali adults points to the conclusion that with sufficient time and effort, even adults without any native language schooling can become literate in English.

References

Alderson, J. C. (1984). Reading in a foreign language. A reading problem or a language problem? In J. C. Alderson & A. H. Urquart (Eds.), *Reading in a Foreign Language*. London: Longman.

Alderson, C. (2000). *Assessing Reading*. Cambridge: Cambridge University Press.

Bailey, N., Madden, C., & Krashen, S. (1974). Is there a 'natural sequence' in adult second language learning? *Language Learning*, 24, 235-243.

Barron, R. W. (1991). Proto-literacy, literacy and the acquisition of phonological awareness. *Learning and Individual Differences*, 3, 243-255.

Barron, R. W. (1994). The sound-to-spelling connection. Orthographic activation in auditory word recognition and its implications for the activation of phonological awareness and literacy skills. In V. Wise-Berninger (Ed.), *The varieties of orthographic knowledge: I. Theoretical and developmental issues* (pp. 219-242). Dordrecht: Kluwer.

Ben-Dror, I., Frost, R., & Bentin, S. (1995). Orthographic representation and phonemic segmentation in skilled readers. A cross-linguistic comparison. *Psychological Science*, 6, 176-181.

Berman, R. A. (1984). Syntactic components of the foreign language reading process.In J. C. Alderson & A. H. Urquhart (Eds.), *Reading in a Foreign Language*. London: Longman.

Bernhardt, E. B. (2005). Progress and procrastination in second language reading. *Annual Review of Applied Linguistics*, 25, 133-150.

Bernhardt, E. B., & Kamil, M. L. (1995). Interpreting relationships between L1 and L2 reading: consolidating the linguistic threshold level and the interdependence hypotheses. *Applied Linguistics*, 16, 15-34.

Bialystok, E., & Hakuta, K. (1999). Confounded age: Linguistic and cognitive factors in age differences for second language acquisition. In D. Birdsong (Ed.), *Second Language Acquisition and the Critical Period Hypothesis* (pp. 161-182). London: Erlbaum.

Bishop, D., & Mogford, K. (1988). *Language Development in Exceptional Circumstances*. London: Lawrence Erlbaum.

Bryant, P. E., & Bradley, L. (1983). Psychological strategies and the development of reading and writing. In M. Martlew (Ed.), *The Psychology of Written Language: Developmental and Educational Perspectives* (pp. 163-178). Chichester: Wiley.

Brown, C. (1993). The role of the L1 grammar in the L2 acquisition of segmental structure. *McGill Working Papers in Linguistics*, 9, 180-210.

Brown, R. (1973). *A First Language*. Cambridge, MA: Harvard University Press.

Brown, K., & Tavares, T.. (2004). The effect of native language literacy on second language acquisition. Paper presented at the TESOL Conference, Long Beach, California. 1 April.

Burt, L., Holm, A., & Dodd, B. (1999). Phonological awareness skills of 4-year-old British children: an assessment and developmental data. *International Journal of Language and Communication Disorders*, 34, 3, 311-336.

Burt, M. (2003). *Issues in improving immigrant workers English language skills*. *ERIC* Brief. Washington, DC. Center for Applied Linguistics.

Burt, M., Kreeft Peyton, J., & Adams, R. (2003). *Reading and Adult English language Learners. A Review of the Research*. Washington, DC: Center for Applied Linguistics.

Burtoff, M. (1985). *Haitian Creole literacy evaluation study: Final Report. ERIC* Brief Washington, DC: Center for Applied Linguistics.

Comings, J. P., Beder, H., Bingman, B., Reder, S., & Smith, C.. (2003). *Establishing an evidence-based adult education system*. Occasional Paper, Cambridge, MA: NCSALL.

Condelli, L., Spruck Wrigley, H., Yoo, K., Seburn, M., & Cronen, S.. (2003). *What Works. Study for Adult ESL Literacy Students. Volume II: Final Report*. American Institutes for Research and Aguirre International. Washington, DC: US Department of Education.

Coulombe, S., Tremblay, J.F., & Marchand, S. (2004). *International Adult Literacy Survey. Literacy Scores Human Capital and Growth Across 14 OECD Countries*. Report no. 89552. Ottawa: Statistics Canada.

Crandall, J., & Peyton, J.K. (Eds.). (1993). *Approaches to Adult ESL Literacy Instruction*. Washington, DC: Center for Applied Linguistics and Delta Systems.

Crystal, D., Fletcher, P. & M. Garman. (1976). *The Grammatical Analysis of Language Disability: A Procedure for Assessment and Remediation*. London: Edward Arnold.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 49, 222-251.

Cunningham Florez, M. (2003). *Working with literacy-level adults English language learners. ERIC* Brief. Washington, DC: Center for Applied Linguistics.

Dustmann, C. & Fabbri, F. (2003). Language proficiency and labour market performance of immigrants in the UK. *The Economic Journal*, 113, 695-717.

Ehri, L. (1994). Development of the ability to read words. Update. In R. Ruddell, M. Ruddell & H. Singer (Eds.), *Theoretical Models and Processes of Reading* (pp. 323-358). Newark, DE: International Reading Association.

Flege, J. E. (1987). A critical period for learning to pronounce foreign languages? *Applied Linguistics*, 8, 162-177.

Foy, J. G., & Mann, V. (2001). Does strength of phonological representations predict phonological awareness in preschool children? *Applied Psycholinguistics*, 22, 301-325.

Fromkin, V., Krashen, S., Curtiss, S., Rigler, D., & Riger, M. (1974). The development of language in Genie: A case of language acquisition beyond the "Critical Period". *Brain and Language*, 1, 81-107.

Gombert, J. E. (1992). *Metalinguistic Development*. London: Harvester Wheatsheaf.

Gombert, J.E. (1994). How do illiterates react to metalinguistic training? *Annals of Dyslexia*, 44, 250-269.

Goswami, U., & Bryant, P. (1990). *Phonological skills and learning to read.* Hove: Psychological Press.

Gough, P., Juel, C., & Griffth P. (1992). Reading, speaking and the orthography cipher. In P. Gough, L. Ehri & R. Treiman (Eds.), *Reading Acquisition.* Hillsdale, NJ: Erlbaum.

Hawkins, M. (2004). Researching English language and literacy development in schools. *Educational Researcher*, 33, 14-25.

Hawkins, R. (2001). *Second Language Syntax: a Generative Introduction.* Oxford: Blackwell.

Heine, B., & Nurse, D. (2000). *African Languages. An Introduction.* Cambridge: Cambridge University Press.

Hoa, H. T. Q. (1965). *A Phonological Contrastive Study of Vietnamese and English.* Unpublished MA thesis. Texas Technology College.

Huntley, H. S. (1992). *The new illiteracy: A study of the pedagogic principles of teaching English as a second language to non-literate adults. ERIC* No. ED356685. Washington, DC: Center for Applied Linguistics.

Institute for Extended Learning (2000). *Community Colleges of Spokane ESL Level Quarter Assessment/Literacy Level.*

Ioup, G., Boustagui, E., El Tigi, M., & Moselle, M. (1994). Reexamining the critical period hypothesis: A case study of successful adult SLA in a naturalistic environment. *Studies in Second Language Acquisition*, 16(1), 73-98.

Johnson, J. & Newport, E. (1989). Critical period effects in second language learning: the influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21, 60-99.

Karmiloff-Smith, A., Grant, J., Sims, K., Jones. M.C., & Cuckle, P. (1996). Rethinking metalinguistic awareness and accessing knowledge about what counts as a word. *Cognition*, 58, 197-219.

Klein, W., & Perdue, C. (1997). The Basic Variety (or: Couldn't natural languages be much simpler?). *Second Language Research*, 13, 301-347.

Koda, K. 1999. Development of L2 intraword orthographic sensitivity and decoding skills. *Modern Language Journal*, 83, 51-64.

Krashen, S. (1973). Lateralization, language learning and the Critical Period: Some new evidence. *Language Learning*, 23, 63-74.

Kurvers, J. (2002). *Met Ongeletterde Ogen. Kennis van taal en schrift van analfabeten.* Amsterdam: Aksant.

Kurvers, J. & Uri, H. (2006). Metalexical Awareness: Development, methodology or written language? A cross-linguistic comparison. *Journal of Psycholinguistic Research.* 35, 4, 353 – 367.

Laufer, B. (1992). How much lexis is necessary for reading comprehension? In P. J. Arnaud & H. Béjoint (Eds.), *Vocabulary and Applied Linguistics* (pp. 126-132). London: MacMillan.

Lenneberg, E. (1967). *Biological Foundations of Language.* New York: Wiley.

Long, M. (1990). Maturational constraints on language development. *Studies in Second Language Acquisition*, 12, 251-285.

Lukatela, K., Carello, C., Shankweiler, D., & Liberman, I. (1995). Phonological awareness in illiterates: Observations from Serbo-Croatian. *Applied Psycholinguistics*, 16, 463-487.

Mace-Matluck, B.J., Alexander-Kaparik, R., & Queen, R.M.. (1999). *Through the Golden Door: Educational Approaches for Immigrant Adolescents with Limited Schooling*. Washington, DC.: Delta Systems.

Major, R. (2001). *Foreign Accent: The Ontogeny and Phylogeny of Second Language Phonology*. London: Erlbaum.

Meara, P. (1992). *EFL Vocabulary Tests*. University of Swansea, Centre for Applied Language Studies.

Morais, J., Cary, L., Alegria, J., & Bertelson, P. (1979). Does awareness of speech as a sequence of phones arise spontaneously? *Cognition*, 7, 323-331.

Morais, J., Alegria, J., & Content, A. (1987). The relationships between segmental analysis and alphabetic literacy: An interactive view. *European Bulletin of Cognitive Psychology*, 7, 415-438.

Morais, J., Content, A., Bertelson, P., Cary, L., & Kolinsky, R.. (1988). Is there a critical period for the acquisition of segmental analysis? *Cognitive Neuropsychology*, 5, 347-352.

Moyer, A. (2004). *Age, Accent and Experience in Second Language Acquisition*. Clevedon: Multilingual Matters.

Muter, V. (2003). *Early Reading Development and Dyslexia*. London: Whurr.

Myles, F. (2005). The emergence of morphosyntax in classroom learners of French. In Dewaele, J-M. (Ed.). *Focus on French as a Foreign Language: Multidisciplinary Approaches*. Clevedon: Multilingual Matters.

Nation, P. (2001). *Learning Vocabulary in Another Language*. Cambridge: CUP.

Newport, E. (1990). Maturational constraints on language learning. *Cognitive Science*, 14, 11-28.

Nurse, D. (Ed.) (2003). *The Bantu Languages*. London: RoutledgeCurzon.

Ng, Ch. (2000). English phonological skills in Chinese ELF learners with different L1 literacy experience. Paper presented at the AAAL conference,.Vancouver. Ogle, D. (2001). Conference address. Investigating Second Language Literacy Research. International Reading Association Conference. 17 July. Washington, DC.

Olsen, D. S. (2002). What writing does to the mind. In E. Amsel & J. Bymes (Eds.), *Language, Literacy and Cognitive Development. Mahwah*, NJ: Erlbaum.

Patkowski, M. (1982). The sensitive period for the acquisition of syntax in a second language. In S. Krashen , R. Scarcella & M. Long (Eds.), *Child-Adult Differences in Second Language Acquisition*. Rowley, MA: Newbury House.

Patkowski, M. (1990). Age and accent in a second language. Reply to James Emil Flege. *Applied Linguistics*, 11, 73-89.

Pienemann, M., Johnston, M., & Brindley, G. (1988). Constructing an acquisition-based procedure for second language assessment. *Studies in Second Language Acquisition*, 10, 217-243.

Rayner, K, Foorman, B.R., Perfetti, C.A., Pesetsky, D., & Seidenberg, M.S. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest*, 2, 2, 31-74.

Read, C., Zhang, Y.F., Nie, H.Y., & Ding, B.Q. (1986). The ability to manipulate speech sounds depends on knowing alphabetic writing. *Cognition*, 24, 31-44.

Reis, A., & Castro-Caldas, A. (1997). Illiteracy: A cause for biased cognitive evelopment. *Journal of the International Neuropsychological Society*, 3, 444-450.

Robson, B. (1982). Hmong literacy, formal education and their effects on performance in an ESL class. In B. T. Downing & D. P. Olney (eds). *The Hmong in the West: Observations and Reports* (pp. 201-225). Minneapolis: University of Minnesota.

Saville-Troike, M. (1991). Teaching and teting for academic achievement: The role of language development. NCBE FOCUS: *Occasional Papers in Bilingual Education*, 4, 1-11.

Scarborough, H. S. (1990). Index of Productive Syntax. *Applied Psycholinguistics*, 11, 1-22.

Seliger, H. (1978). Implications of a multiple critical period hypothesis for second language learning. In W. Ritchie (Ed.), *Second Language Acquisition Research*. New York: Academic Press..

Shameem, N., McDermott, K., Martin-Blaker, J., & Carryer, J. (2002). *A Report on the Literacy Gains of Low-level and Pre-literate Adult Learners in Literacy Classes. Executive Summary*. UNITEC Institute of Technology Centre for Refugee Education Auckland University of Technology. Auckland, New Zealand.

Su, F.H., & Huang, L.S. (2004). Chinese-speaking children's awareness of English phonological units. In M. Baynham, A. Deignan & G. White (Eds). *BAAL 2004. Applied Linguistics at the Interface. British Studies in Applied Linguistics*, 19, 47-61.

Tarone, E., & Bigelow, M. (2005). Impact of literacy on oral language processing: mplications for second language acquistion research. *Annual Review of Applied Linguistics*, 25, 77-97.

Vainikka, A., & Young-Scholten, M. (2002). Restructuring the CP in L2 German. In B. Skrabela, S. Fish & A. H.J. Do (Eds.), *Proceedings of the XXVI Boston University Conference on Language Development* (pp. 712-722). Sommerville, MA: Cascadilla Press.

VanPatten, B. (1988). Review essay. How juries get hung: Problems with the vidence for focus on form in teaching. *Language Learning*, 38, 243-260.

White, L. (1989). *Universal Grammar and Second Language Acquisition*. Amterdam: Benjamins.

White, L. (2003). *Second Language Acquisition and Universal Grammar*. Cambridge: CUP.

Wrigley, H. S., & Guth, G.J.A.. (1992). *Bringing Literacy to Life. Issues and Options in Adult ESL Literacy*. San Mateo: Aguirre International.

Young-Scholten, M. & Archibald, J. (2000). Second language syllable structure. In J. Archibald (Ed.*), Second Language Acquisition and Linguistic Theory*. Oxford: Blackwell.

Young-Scholten, M., Ijuin, C. & Vainikka, A. (2005). Organic Grammar as a measure of development. TESOL meeting. San Antonio, Texas 1 April.