PINYIN: AN IMPORTANT FACTOR IN LEARNING ENGLISH

by

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ABSTRACT

Extensive research in the fields of reading and linguistics has shown that the metalinguistic skill of segmenting the speech stream into discrete units of sound called phonemes is crucial to the development of reading and spelling skills in an alphabetic writing system. To investigate whether speakers whose first language is represented by a logographic script and who are enrolled in advanced levels of English as a Second Language classes have acquired the skill of phonemic segmentation, native speakers of English from Canada and nonnative speakers of English from the People's Republic of China and Hong Kong participated in a phoneme counting task. Subjects from the People's Republic of China had acquired alphabetic first language literacy since they had learned Pinyin prior to learning to read Chinese characters. Pinyin is a phonemic representation of the Chinese language in Roman characters and is a transitional alphabet used in literacy training. Subjects from the People's Republic of China with alphabetic first language literacy were expected to outperform subjects from Hong Kong with nonalphabetic first language literacy. As anticipated, the native speakers of Canadian English outperformed both Chinese groups. More importantly, the

subjects from the People's Republic of China significantly outperformed subjects from Hong Kong on three subtests which included words with one-to-one phoneme-to-grapheme correspondences, words with one-to-many phoneme-to-grapheme correspondences and nonwords. These three subtests were taken from a study by Holm and Dodd (1996), which indicated that students with nonalphabetic first language literacy had limited phonological awareness on phonological processing, reading and spelling tasks. The results of the present study and the Holm and Dodd study suggest that learning Pinyin has a beneficial effect on the performance of ESL learners in segmenting phonemes in English. Furthermore, the results clearly indicate that students who have nonalphabetic first language literacy can be enrolled in advanced levels of ESL courses and still not have acquired the metalinguistic skill of phoneme segmentation, which suggests that explicit training in segmenting the spoken language is required. The general conclusion of this study is that alphabetic literacy in L1 boosts phoneme segmentation skill.

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DEDICATION

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Chapter I

Review of the Literature

This interpretive literature review will explore the research in the area of phonemic awareness and highlight its significance for learners in these explicit ways: the importance of grasping the alphabetic principle, the explication of two competing theories which attempt to account for the degree of interaction between a language's phonology and orthography, the development of a child's linguistic system viewed within the framework of a model of metalinguistic development, and the benefits of training in phonemic awareness.

Over the past twenty-five years, extensive research in the fields of psycholinguistics and reading has provided evidence that phonemic awareness is a powerful predictor of reading achievement (Mann & Liberman, 1984; Mann, 1986; Lundberg, Frost, & Petersen, 1988; Liberman, Liberman, Mattingly, & Shankweiler 1980; Stanovich, Cunningham, & Cramer, 1984; Tumner & Bowey, 1984; Liberman, Shankweiler, Fischer, & Carter, 1974). Phonemic awareness encompasses "both the metalinguistic insight that words can be segmented into sequences of phonemes and the ability to separate the internal structure of a word into its phonemic constituents" (Koda, 1994, p. 9). This vast amount of research has

focused for the most part on children who are pre-readers, in the process of learning to read, or on accomplished readers.

The Alphabetic Principle

The alphabetic principle is the association between the sounds of the language and the graphemes that represent those sounds. Recognizing that speech is segmental in nature and that words are made up of sequences of phonemes allows the learner to grasp the alphabetic principle. This principle requires an explicit awareness of the internal structure of words; an awareness that is required for the processes of reading and writing. Bryne (1990) reported that the alphabetic principle is not an easy one to grasp, even for English speakers who have had some literacy instruction. In addition, the vast literature on reading development suggests that the one major identifiable obstacle that learning to read presents to beginning readers is the grapheme-phoneme correspondence problem (Gibb & Randall, 1988). Phonemes are "abstract categories of language" which are normally conveyed by sounds but are not by themselves sounds (Liberman & Shankweiler, 1991, p. 4). These investigators point out that it is not merely associating a letter with a sound but more importantly understanding how the visual shapes relate to the phonology of a word. Furthermore, grasping the alphabetic principle

can be difficult even in an alphabetic language that uses an alphabetic orthography where the alphabetic transcription approximates the phonological structure. Why? The processes of speech perception that recover the phonological structure are automatic and unconscious; in reading the reader must group the letters "to put together just those strings of consonants and vowels that are, in the normal process of speech production, collapsed, merged, coarticulated into a single, pronounceable unit" (Liberman & Shankweiler, 1991, p. 13). These researchers believe that the ability to efficiently and automatically combine the letters of a new word into the appropriate pronounceable units distinguishes the fluent reader from the beginner who does not understand an alphabetic orthography.

Further evidence from studies indicates that poor readers, beginning readers, and alphabetically illiterate adults find segmenting speech sounds or words into phonemes a challenging task (Lukatela, Carello, Shankweiler, & Liberman, 1995; Morais, Cary, Alegria, & Bertelson, 1979; Mann, 1986). For children who are beginning readers, part of their difficulty in grasping the alphabetic principle may be overlaying an unfamiliar orthography onto a familiar phonology (Templeton & Scarborough-Franks, 1985).

The metalinguistic insight that words can be analyzed into phonemes is critical in the development of word decoding skills, which enables the learner to "crack the

code" of the English orthographic system (Bowey & Patel, 1988). And research has shown that one of the differences between good and poor readers is their level of decoding skills (Stanovich, 1980; Eskey, 1988). In addition, there are a number of studies that strongly support the fact that lack of phonological awareness is related to failure in reading and writing (Blachman, 1984; Bradley & Bryant, 1983; Fox & Routh, 1980; Treiman & Baron, 1981; Vellutino & Scanlon, 1987). Also, Liberman, Shankweiler, and Liberman (1989) report that similar findings were supported by studies in Swedish, Spanish, French and Italian. These findings suggest that explicit phonological awareness is needed to uncover the alphabetic principle and that a delay in discovering this principle may have an increasingly adverse effect on reading and other areas (Tunmer, Herriman, & Nesdale, 1988). Results of a study by Bowey (1986) indicate that the difference between skilled and less skilled readers, as defined by decoding skill, may also manifest itself in a substantial delay in the development of syntactic awareness. Therefore, phonemic segmentation may assist in identifying children who may be at risk for reading disability.

Two Competing Theories Which Characterize the Degree of Interaction Between The Phonology of a Language and Its Orthography

For a learner, whether child or adult, to master the alphabetic principle s/he must realize that words can be broken into syllables and phonemes and that it is the phoneme that is the unit in the speech stream which is represented by letters in an alphabetic orthography. Orthographies are generally classified into phonographic (alphabetic and syllabic) and logographic (Mattingly, 1992). In a logography, a meaning-based system, the basic unit of representation is the morpheme. Here a one-to-one correspondence is established between "the graphemic representation of an individual symbol and a phonological code of an entire morpheme" (Koda, 1994, p. 9).

Chinese uses a logographic orthography. Most Chinese characters contain two components: a radical and a phonetic. Huang and Hanley (1995) propose that more than 80 percent of Chinese characters contain a phonetic component. The purpose of the phonetic component in the character is to provide a pronunciation clue; however, these researchers note that the phonetic is not always a reliable guide to pronunciation for three reasons: 1) the pronunciation of some words has changed over the centuries; 2) the phonetic does not appear in the same position in relation to the

radical in all characters; and 3) the relationship between the phonetic and the word itself varies as it may be homophonic with the word being written or merely rhyme with it. Although logographic symbols may contain a phonetic compound, these compounds do not have the same function as the phoneme-to-grapheme correspondences in alphabetic characters. Therefore, memorization plays a key role in knowing which sound to give each symbol in a language like Chinese (Koda, 1994).

Studies have shown that in logographic orthographies, phonological codes are generally obtained through memory search and not by direct analysis of phonological information in the visual configuration, a strategy that is typical of alphabetic readers (Koda, 1994; Gleitman, 1985; Mann, 1985; Perfetti & Zhang, 1995, Chikamatsu, 1996).

Orthographies have been shown to play a key role in the strategies learners use to read. For example, consider the phonological and visual routes involved in word recognition. In the phonological route, also known as the assembled routine, a printed word is analyzed into its internal constituents, phonemes, which are represented by letters; the sounds and letters are then assembled together to give a phonological representation. In the visual route to word recognition, also known as the addressed routine, phonological coding takes place concurrently with semantic coding. Chikamatsu (1996) reports of cross-linguistic

studies that demonstrated that English word recognition has extensive phonological coding, whereas Chinese word recognition relies on the visual route. And although English has a predominantly phonological route, high frequency words can also be processed by the visual route. Conversely, Chinese words may involve automatic phonological coding when the words are very familiar and the association between the visual representation and the sound is strong (Chikamatsu).

Presently the orthographic depth hypothesis (ODH), which refers to the degree of interaction between phonological and visual coding, is being used to distinguish among the processes used in alphabetic, syllabic, and logographic scripts. Here are the two basic principles of ODH as reported by Chikamatsu (1996): firstly, the more shallow the orthography, meaning the more consistent the sound-spelling correspondence, the more phonological coding is involved; secondly, the deeper the orthography, meaning the less consistent and more opaque the sound-spelling correspondences, the more likely a direct route is activated.

Chikamatsu (1996) provided evidence of ODH in his study of American and Chinese learners of Japanese. The Japanese language is represented by two basic forms of writing: kanji and kana (Wakan, 1990; Chikamatsu, 1996; Mann, 1986).

(The following description of these two forms of writing is based on Naomi Wakan's (1990) text, Japanese--an appetizer.)

Kanji is a logographic system consisting of Chinese characters in which each character represents a morpheme and is used primarily to represent nouns and the roots of verbs. There are approximately 200 primary kanji elements or radicals that form the basis of the 1945 kanji that literate Japanese adults use.

Spoken Japanese differs substantially from spoken Chinese, which resulted in the invention of phonetic scripts to represent the oral language of the Japanese. The second basic form of transcription, kana, is a syllabary in which each syllable or sound unit is represented by a letter. Moreover, kana is subdivided into these phonetic scripts: romaji, hiragana, and katakana. Romaji, which consists of the 26 letters of the Roman alphabet, is used specifically for acronyms and for writing Japanese words for the benefit of Western readers. Hiragana and katakana each consist of 46 basic symbols and 25 additional symbols with diacritic marks (Chikamatsu, 1996) and are the most widely used phonetic scripts. Hiragana symbols are easier and faster to write and learn than the kanji symbols that they are derived from. Hiragana is used for function words and some content words, whereas katakana is used only for foreign words and loan words, mainly from Western languages. Although all sounds in Japanese can be written with hiragana symbols,

hiragana is generally used with kanji. Japanese children learn to write hiragana before learning to write kanji.

In Chikamatsu's (1996) study of the effects of L1 orthography on L2 word recognition, 45 American and 17 Chinese college students participated. These students were enrolled in the second semester of Japanese 102 at a university in the United States. The subjects in this study began to learn hiragana during the first week of a first semester course, Japanese 101. Katakana was also introduced in Japanese 101 but not until the third month. Most of the content words that usually appear in kanji were introduced to the students in hiragana, thereby limiting their exposure to kanji. In this study, 320 test items consisting of 80 visually familiar words (40 hiragana and 40 katakana), 80 visually unfamiliar words (40 hiragana and 40 katakana) and 160 nonwords (80 hiragana and 80 katakana) were presented to the subjects. The results indicated that Chinese subjects depended more on visual information in words than did English subjects. Word length effects indicated that English subjects depended more on phonological information in words than did the Chinese subjects, especially when the words were written in the script, hiragana--the script that the subjects had the most exposure to in their Japanese courses. Each group used different word recognition strategies in L2 that reflected their L1 orthography. Katz and Frost (1992) propose that the differences in

orthographic depth lead to differences in processing also. Whereas shallow orthographies easily support a word recognition process that involves the phonology of the first language, deep orthographies require printed words to be processed by referring to their morphology via the printed word's visual-orthographic structure.

The orthographic depth hypothesis is now competing with the universal phonological principle (UPP). UPP predicts that automatic activation of phonological information occurs in all orthographies. Perfetti and Zhang (1995) required Chinese subjects to decide whether two characters had the same pronunciation. The researchers observed that when two items were synonyms, there was semantic interference, and when two items were homophones, there was phonological interference. These researchers concluded that phonological coding is activated in Chinese word recognition. Tan, Hoosain, and Peng (1995) demonstrated that phonological information in Chinese words is obtained on a character-as-a-whole-to-sound-as-a-whole basis not as phoneme-to-grapheme correspondences.

With respect to the English language, it has generally been categorized as a deep orthography because of its irregular phoneme-to-grapheme correspondences demonstrated in words such as `have', `deaf', `colonel' (Besner & Chapnik Smith, 1992; Seidenberg, 1992). However, Lukatela, Carello, Shankweiler, and Liberman (1996) place English in the middle

of an orthographic depth continuum, with Serbo-Croatian anchoring one end with the Romance languages whereas Hebrew and logographic Chinese anchor the other end.

In summary, the two theories, ODH and UPP, appear to be complementary. Although automatic phonological coding may be present in all languages, the strength of that phonological coding may be represented by the depth of the orthography.

From the research presented thus far, the facility with which adult learners of a nonalphabetic language are able to segment words into phonemes may hinge upon how the sounds of their first language map onto the orthography of those languages (Shankweiler, Liberman, Mark, Fowler, & Fischer, 1979; Liberman, Liberman, Mattingly, & Shankweiler 1980; Lukatela, Carello, Shankweiler, & Liberman, 1995; Frost, 1994). Further evidence suggests that the ability to segment phonemes depends in part on being able to read an alphabetic orthography.

Read, Zhang, Nie, and Ding (1986) conducted a study in the People's Republic of China which compared a group of readers who were taught to read the Chinese logographic system with a group who had learned logographs as well as Pinyin. Pinyin is a phonemic representation of the language in Roman characters and is a transitional alphabet used in literacy training. Since 1958, (Ramsey, 1987) children in the People's Republic of China have learned to transcribe

words in their native language in this alphabet as a precursor to learning to read and write using the logographic characters ordinarily used for representing the Chinese language. The group of readers who had learned Pinyin in the study by Read et al. were able to add and delete phonemes well in comparison to the group that had only learned to read Chinese logographic characters. Holm and Dodd (1996) conducted a study of four language groups, which included ten students from each of these countries: the People's Republic of China, Australia, Hong Kong, and Vietnam. On phonological awareness tasks that included phoneme segmentation, spoonerisms, rhyme detection, and spelling, the subjects from the People's Republic of China with training in Pinyin outperformed the Hong Kong students who were trained only in Chinese logographs.

Morais, Cary, Alegria, and Bertelson (1979) presented phoneme manipulation (oral language) tasks to illiterate Portuguese adults and to a literate group who had learned to read as adults. Here, the literate group strongly outperformed the illiterate group, which led the researchers to conclude that phonological awareness does not occur automatically without learning to read an alphabetic orthography. Morais, Bertelson, Cary, and Alegria (1986) again used groups of illiterate and ex-illiterate Portuguese adults to determine the effect of literacy training on speech segmentation. Several speech segmentation tasks were

used which included progressive segmentation of speech, detection of target sounds in auditorily presented speech, melody segmentation, rhyme detection, and recall of pictures with rhyming and non-rhyming names. The results obtained mirrored those of the previous study by Morais et al. (1979) in which the illiterate group performed poorly on the tasks involving phonemic segmentation, although these subjects were able to successfully perform syllable deletions and rhyme detection tasks. In the 1986 study by Morais et al., when the ex-illiterate subjects were separated into good and poor readers, large differences between illiterates and poor readers were detected in contrast to the differences between good and poor readers.

Gombert (1994) trained illiterate North African adults, who had immigrated to France, to master three metalinguistic tasks: judgment of phonological length of words, deletion of initial consonant, and lexical segmentation of sentences. Subjects included literates, partial literates, and illiterates, all of whom received the same training. The purpose of the study was to show that metalinguistic skills, thought to be at a lower level in illiterates than literates, may be improved with specific training and to confirm the results of the study by Morais, Content, Bertelson, Cary, and Kolinsky (1988). On the phonological judgment and consonant deletion task, the effect of the training was significant, with the results on the consonant

deletion task being dramatic. On a pretest of consonant deletion, the means for partial illiterates and illiterates were 36 and 17 respectively, whereas on the posttest the scores were 71 and 60. Although all three groups profited from the training, the illiterate and partial illiterates profited substantially. A hierarchy of difficulty was revealed in the results of the three tasks: the phonological judgment task was most easily completed, the phoneme deletion task appeared to be more difficult to complete, and the lexical segmentation appeared to be the most difficult and a measure of syntactic awareness more than phonological awareness.

Lukatela, Carello, Shankweiler, and Liberman (1995) assessed adult illiterate and semi-literate Serbo-Croatian subjects on the measures of reading, writing, and phonological tasks. Subjects were tested on three metalinguistic tasks that tested their ability to segment speech: phoneme counting, syllable counting, and deletion of initial consonant. The results indicated that truly illiterate subjects had minimal phonemic awareness but could achieve some success on a syllable counting task. In addition, the results indicated that there was a strong link between alphabetic familiarity and phonemic awareness in the Serbo-Croatian language. As the authors of this study point out, in this language, the orthography-phonology link is explicit as each grapheme has only one phonemic

interpretation; therefore, this language is considered to have a shallow orthography. It appears that this orthography is a highly phonologically penetrable one, which punctuates the fact that the link between alphabetic familiarity and phonemic awareness is language specific.

Huang and Hanley (1995) investigated the relationship between phonological awareness and reading skill of children from Hong Kong and Taiwan who were learning to read Chinese and children from Britain who were learning to read English. Children from Taiwan learn a phonological script, Zhu-Yin-Fu-Hao, before they are taught Chinese characters, whereas children from Hong Kong do not. Zhu-Yin-Fu-Hao is a phonetic script in which a phoneme is represented by a unique character. (This script differs from Pinyin in this important element: Pinyin, a phonemic system, is represented by the Roman alphabet.) The results indicated that performance on rhyme and phoneme detection tasks were significantly related to the reading ability of the British children only. However, the results of a visual skills test were significantly related to reading ability in both groups of Chinese speaking children. Furthermore, the performance on the phoneme deletion task seemed to be influenced by whether or not the child had learned an alphabetic script in the language in which the subject was being tested. These studies indicate that alphabetic literacy is pivotal in developing phonological segmentation abilities.

Models of Metalinguistic Development

Morais, Alegria, and Content (1987) claim that although reading and writing require phonological awareness, good readers develop automaticity of this process, whereas poor readers may possess phonological awareness but this process may not have become automated. Similarly, Liberman and Shankweiler (1991) note that the ability to efficiently and automatically combine the letters of a new word into the appropriate pronounceable units "is an aspect of reading skill that, as much as any other, separates the fluent reader from the beginner who does not understand what an alphabetic orthography is all about" (p. 13).

Children generally are able to master the language structure of their native language orally before reading instruction begins. Moreover, children's experience of their linguistic community enables them to acquire an "unconscious awareness of aspects of the system of language sounds which tacitly enables them to organize phonological segments"; this unconscious awareness is a requisite step to being able to achieve conscious awareness and then deliberate control (Gombert, 1992, p. 36). In contrast, adult learners of an alphabetic language, who do not have alphabetic first language literacy, are unlikely to tacitly develop phonemic awareness of an alphabetic language. Most adult learners of an alphabetic language generally learn

literacy and oral skills concomitantly; therefore, for phonemic awareness to become an automated "meta" process, they need to develop automaticity through language practice of the phoneme-to-grapheme correspondences and by manipulating and segmenting words into speech components. Although the roles that phonological awareness plays for the beginning adult reader who has no alphabetic first language literacy may appear to be twofold: printed symbols represent units of speech and these units of speech are called phonemes, the challenging dimension of these roles is becoming aware of the phonological nature of our language (Wagner & Torgesen, 1987).

To understand how phonemic awareness develops, it must be viewed within the framework of metalinguistic awareness. Metalinguistic awareness involves conscious reflection on, analysis of, or intentional control over various aspects of language--phonology, morphology, syntactic, and textual--all of which are used to think about and process language. This awareness takes place outside the normal unconscious process of production or comprehension (Karmiloff-Smith, Grant, Sims, Jones, & Cuckle, 1996).

There are several models of metalinguistic development that have been written about extensively in the research literature and which share common elements; namely, declarative and procedural knowledge. Other terms used are

epilinguistic and metalinguistic knowledge (Gombert, 1992) unanalyzed and analyzed knowledge (Bialystok & Bouchard Ryan, 1985) implicit and explicit knowledge (Karmiloff-Smith, 1986). Generally, the terms implicit, epilinguistic, and unanalyzed knowledge refer to unconscious, intuitive knowledge in contrast to explicit, metalinguistic, and analyzed knowledge which refer to objective conscious knowledge. These are important distinctions that manifest themselves in Gombert's model of metalinguistic development that is based on extensive analyses of metalinguistic and psycholinguistic research. Gombert credits Karmiloff-Smith's model of metalinguistic development as the basis for the model that he has developed.

Gombert's model (1992) defines four stages of metalinguistic development: (1) the acquisition of linguistic skills, (2) the acquisition of epilinguistic control, (3) the acquisition of metalinguistic awareness and (4) the automation of metaprocesses. Only stages one and two are obligatory.

According to Gombert (1992), in stage one, a child develops linguistic skills "on the basis of the model provided by adults" who provide positive and negative feedback enabling the reinforcement of adequate productions and the elimination of inadequate ones (Gombert, p. 187). This feedback enables the child to store in memory a "sound configuration which probably embraces a number of linguistic

forms and meanings which frequently coexist in a short segment of the speech chain" (Gombert, p. 187). However, as the child encounters more complex linguistic forms, the former ones that had become stabilized are now thrown into uncertainty.

Gombert's view of the acquisition of linguistic skills clearly differs from Chomsky's universal grammar in which language development is viewed as the gradual unfolding of innate language abilities (Chomsky, 1965). Here a child's interaction with the environment plays a minor triggering role, as it is through an innate language capability that the acquisition of language is made so easy and rapid. This is in contrast to Gombert's view of language development where a child acquires linguistic skills on the basis of the model provided by the adult.

In stage two, acquisition of epilinguistic control, the child gradually organizes the implicit knowledge gained in stage one and begins to link this knowledge to new linguistic forms thereby developing an unreflected, unconscious awareness of a linguistic system. The stability gained in this phase, allows the child a "type of top-down control of the linguistic processing s/he applies" and allows the child to apply linguistic rules that become general in scope and gradually "constitute a system" (p. 189). A fundamental principle of this stage is that the

automatic application of the linguistic knowledge that the child has tacitly acquired cannot be described verbally.

Stage three, the acquisition of metalinguistic awareness, is marked by the necessity for intentional control over the stable linguistic system acquired in stage two. For example, the processes of reading and writing demand the conscious knowledge and intentional control over many aspects of language. At this level, the distinction between procedural and declarative knowledge becomes important; procedural knowledge is implicit, unconscious, unanalyzed knowledge, a prerequisite to declarative knowledge--the explicit, conscious, intentional, controlled application of knowledge. When the conscious linguistic processing acquired in stage three becomes automatic, these processes become metaprocesses which the learner can consciously access when needed. This automaticity of metaprocesses is the last stage of Gombert's model of metalinguistic development.

Gombert (1990) is quite clear that the intentional control and reflective character of metalinguistic behaviour differentiates metalinguistic competence from Chomsky's (1965) concept of linguistic competence. Linguistic competence does not require a conscious knowledge of the rules that govern the grammaticality of sentences. Gombert reserves the term epilinguistic for the "designation of behaviour which is related to metalinguistic behaviour

but whose unconscious nature appears to be established" (p. 10).

An examination of Karmiloff-Smith's model (1986), which she describes as a three-phase recursive model, is similar to Gombert's in fundamental ways. Phase one is the acquisition of linguistic skills that children develop naturally, phase two is the acquisition of metaprocesses, which are unconscious, and phase three is conscious statable awareness. Metaprocesses are a "fundamental aspect of the way in which developing children spontaneously work on their linguistic representations outside normal input/output relations" (Karmiloff-Smith, p. 101). Integral to these two models of metalinguistic development is this important fact: accessing conscious control depends on acquiring epiprocesses, to use Gombert's term, or metaprocesses, to use Karmiloff-Smith's, which refer to unconscious, stable knowledge of a linguistic system that cannot be described verbally. Gombert goes one step beyond Karmiloff-Smith's third phase of conscious access and includes the automaticity of metaprocesses as the last stage in his model of metalinguistic development--"meta" processing imposes a high cognitive burden; therefore, through practice these processes can become automated and can be easily accessed when needed if an "obstacle impairs the automatic functioning of linguistic processing" (Gombert, 1992, p. 191).

Viewing these models in terms of phonemic awareness suggests that children's experience in their linguistic community provides them with an unconscious awareness of the phonological code of their language. After a child achieves stability of the phonological code, epiphonological control, s/he can then progress to the next phase of development: phonemic awareness; it is often the learning of reading and writing skills that demand a conscious awareness of phonemes. Once a child has grasped the alphabetic principle and can consciously analyze speech segments into phonemes, through repeated practice these phoneme-to-grapheme correspondences become automated. This automaticity reduces the cognitive burden imposed by a "meta" process and allows the learner to devote his/her efforts to the learning the rules of the written language.

In contrast, the adult learner of an alphabetic language without alphabetic literacy in L1 is often faced with learning oral and literacy skills concomitantly. Therefore, adult learners of English often do not have the opportunity to develop epiprocesses, those unconscious automatic linguistic processes which are critical to the development of metalinguistic awareness. The lack of automaticity of linguistic skills for the adult learner of English at the beginner level would be mirrored in an obvious lack of "meta" processes and herein lies the

greatest challenge for the learner and the biggest of teaching opportunities for the educator.

Phonemic awareness strategies, in addition to syntactic, semantic, lexical, textual, and morphological ones, are concrete "bottom-up" processing strategies that the normal reader employs simultaneously to process texts. Although the research presented so far highlights the importance of phonemic awareness, little reference to this vast body of research is reflected in the second language literature. Amos Paran (1996) emphasizes the importance of phonemic awareness and its role in enabling a learner to become an independent reader. However, this author also notes, as do others, (Holm & Dodd, 1996; Bernhardt, 1991; Eskey, 1988), that top-down processing models dominate the second language literature. For example, Bernhardt (1991) reports that in analyzing the theoretical and empirical studies that relate to second language reading development within selected journals from 1974 to 1988, 66.4 percent of them include references to Goodman (1968) and Smith (1971) who emphasize the higher-level cognitive skills such as prediction and interpretation of meaning through context clues and background knowledge. According to Bernhardt, an awareness of other models of reading development in a second language has virtually been nonexistent in the second language literature.

Eskey (1988) criticized reading theories such as Goodman's that emphasized the importance of the top-down processes as the means to achieving reading fluency at the expense of the bottom-up processes. Eskey emphasizes the fact that good language decoding skills are essential skills that give a reader the freedom to think about and interpret the text. He notes that good readers, defined as readers who are accurate and fluid, are both good decoders and interpreters of text. Furthermore, he mentions that researchers and teachers have recognized that the lack of top-down processing skills such as understanding of culture, background knowledge, subject matter, etc., pose difficulties for the second language reader, but he feels that more researchers and teachers must recognize that the lack of bottom-up processing skills pose just as many difficulties. Eskey encourages educators to teach bottom-up processing skills in second language reading, as accurate decoding combined with interpretation of text will lead to successful comprehension, the interactive approach. Furthermore, Eskey endorses this model because of the empirical research that supports the importance of bottom-up processes. Clearly, for second language learners to become independent readers, bottom-up processes must become automated. Moreover, explicit training will be instrumental in automating these processes.

Training in Phonemic Awareness

Explicit training in phonemic analysis brings about improvement in early reading and spelling achievement (Bradley & Bryant, 1983; Williams, 1980), significant advances in learning to read (Bradley & Bryant, 1985; Ball & Blachman, 1991; Lundberg, Frost & Petersen, 1988) as well as playing a key role in the development of word recognition skills (Adams, 1990). Consequently, researchers continue to promote the importance of training in the process of developing phonemic segmentation skills (Liberman, Shankweiler, & Liberman, 1989; Mattingly, 1972; Gombert, 1994).

Bradley and Bryant's (1985) longitudinal study of the effects of phonological awareness training on reading skill, included 65 children who were divided into three treatment groups and one control group and who were selected on the basis of poor performance on a sound categorization task. Groups received 40 training sessions once a week over a two-year period; one group was taught categorization of words based on sounds; a second group received the same training but also used plastic letters to demonstrate how each common sound was represented by a letter of the alphabet. The third group was trained to categorize words on the basis of a conceptual category (animals, colours, etc.) while the fourth group received no training. The results indicated

substantial gains were achieved in spelling and reading when sound-symbol correspondences were tied to an explicit connection with the alphabet. This significant difference was borne out again five years later when these groups were retested (Bradley, 1988). Performance was measured on standardized tests of reading and spelling where differences were noted and on a math test where no differences were noted.

Ball and Blachman (1991) evaluated the effects of training in phonemic segmentation and of instruction in letter names and sounds on kindergarten children's reading and spelling skills. There were three groups in the study: one group received training in segmenting words into phonemes in addition to training in letter name and sound correspondences, a second group received only training in letter names and sounds correspondences, and a control group received no training. The results indicated that the group that received the segmentation training in combination with letter name and letter sound correspondences significantly improved the early reading and spelling skills of children in the phoneme awareness group.

Williams (1980) describes The ABDs of Reading, an instructional program that provides explicit training in phoneme analysis, phoneme blending, letter-sound correspondences, and decoding. This program was used to teach learning disabled children these skills over a two-

year period. The results indicated that instructed children were able to transfer their decoding skills to novel combinations of letters significantly better than did the control group. The results suggests that phonemic skills should be emphasized in beginning reading instruction.

Vellutino and Scanlon (1987) conducted two studies that investigated the correlation between linguistic coding deficits and reading disability and concluded that phonological coding deficits are a significant source of reading difficulty in beginning readers. These researchers provided evidence that tests of oral reading and pseudoword decoding were highly correlated, suggesting that segmentation ability, phonetic decoding and oral reading are "intrinsically related skills" (p. 357). In addition, training in phonemic segmentation had a beneficial effect on the acquisition of word recognition skill for poor and normal readers.

A longitudinal study by Lundberg, Frost, and Petersen (1988) taught an experimental group of kindergarten subjects a variety of analytic word games. This group was found to have acquired superior phonemic awareness at the end of the school year in comparison to a matched control group. The experimental group was retested in grades one and two and again outperformed the control group in reading and spelling, although they performed below the control group in math and IQ.

In conclusion, all the research in the field of phonemic awareness as determined by measures of segmenting, blending, counting, or reversing phonemes appears to measure a "single construct or underlying ability" rather than multiple and unrelated skills (Wagner & Torgesen, 1987, p. 202). In addition, the research suggests that heightening phonemic awareness appears to have a beneficial effect on developing early reading and spelling skills as well as preventing failure in these areas (Bradley & Bryant, 1985; Vellutino & Scanlon, 1987; Ball & Blachman, 1991).

Chapter II

Phonemic awareness requires the acquisition of the alphabetic principle and the automation of phoneme-grapheme correspondences. The extensive first language research into phonemic awareness, as outlined in Chapter I, presents a comprehensive framework for the importance of phonemic awareness in the acquisition of reading skill. However, this research has been largely ignored in the second language literature (Eskey, 1988; Bernhardt, 1991; Holm & Dodd, 1996; Paran, 1996). And although skilled reading requires the constant interaction between bottom-up and top-down processes (McClelland & Rumelhart, 1981; Lesgold & Perfetti, 1981), the second language literature has chosen to focus on the importance of the top-down processes at the expense of the bottom-up processes.

Weber (1984) noted that the top-down perspective

> fails to accommodate important empirical evidence adequately. The interactive models, attempting to be more comprehensive, rigorous and coherent, give emphasis to the interrelations between the graphic display in the text, various levels of linguistic knowledge and processes, and various cognitive activities, (p. 113).

Lack of automaticity of phonemic awareness, an important bottom-up process, can distinguish poor readers from good readers (Morais, Alegria, & Content 1987; Eskey, 1988; Liberman & Shankweiler, 1991). Developing automaticity of this bottom-up process is fundamentally

important to the development of reading skills for the adult second language learner of English. Whereas a native speaker tacitly develops the phonological code of his/her linguistic community, the adult learner of English is confronted with learning the phonological code of English. And herein lies a fundamental distinction--tacit development versus explicit learning.

Tacit development of the phonological code allows for the acquisition of epiphonological control, an epiprocess, which is defined as an automatic, unconscious linguistic process and a prerequisite for the acquisition of metaphonological awareness (Gombert, 1992). The normal native speaker effortlessly applies the phonological code of English unconsciously and automatically. This contrasts sharply with the adult learner of English who is often faced with learning oral and literacy skills concomitantly. In this situation, the adult learner of English is crippled by a lack of epiprocesses which are vital to the development of "meta" processes. Developing automaticity of the phonological processes inherent in the language, for the adult learner of English, must be acquired through explicit practice and instruction so that the epiprocesses can become automatized thereby providing an opportunity for the learner to acquire metaphonological awareness--as a metaprocess can only be acquired through an epiprocess. Furthermore, automaticity of metaprocesses allows for a reduction in the

cognitive burden imposed by "meta" processes and enables the adult learner of English to focus his/her efforts on literacy skills (Gombert, 1992).

Although the majority of adult second language learners regard the process of learning English as challenging, a greater challenge is presented to the adult learner who lacks alphabetic first language literacy. Subjects with logographic orthographies have demonstrated that they use reading strategies that are consistent with their orthographic background when reading English as L2 (Holm & Dodd, 1996; Koda 1994). Moreover, research has shown that phonemic awareness is limited for subjects who lack alphabetic first language literacy (Read, Zhang, Nie, & Ding, 1986; Holm & Dodd, 1996). This research underscores the necessity of providing explicit training in phonemic awareness, for it is through explicit training that adult learners of English will be provided with the opportunity to develop epiprocesses--those processes that are pivotal to the development of metalinguistic awareness.

The research presented in the field of phonemic awareness provides convincing evidence of the importance of its role in acquiring both the alphabetic principle and metaphonological awareness. In addition, the benefits derived from explicit training in phonemic awareness have extended well beyond the initial training phase (Bradley & Bryant 1985; Lundberg, Frost, & Petersen, 1988). Bradley

and Bryant's (1985) study demonstrated that training in categorization of words based on sounds and reinforced through letter-to-sound correspondences provided substantial benefits in reading and spelling skills. Moreover, this result was borne out again five years later when the subjects were tested on standardized reading and spelling tests (Bradley, 1988). In addition, training in phonemic awareness can assist in developing the automaticity of the phonological code of English enabling the learner to advance beyond the epilinguistic phase to metalinguistic phase.

The evidence presented of the inability of illiterates (Gombert 1994; Morais, Cary, Alegria, & Bertelson, 1979; Morais, Bertelson, Cary, & Alegria, 1986), semiliterate adults (Lukatela, Carello, Shankweiler, & Liberman, 1995) most prereading children (Liberman, Shankweiler, Fischer, & Carter, 1974) and reading disabled learners (Shankweiler, 1989) to isolate phonemes in the speech chain demonstrates that phonemic awareness is not "an automatic and inevitable concomitant of speaking a language" (Hodgson, 1992, p. 97). Furthermore, other studies have shown that the inability to consciously segment phonemes is a consequence of not having developed alphabetic literacy in L1 (Read, Zhang, Nie, & Ding, 1986; Holm & Dodd, 1996). In conclusion, this research provides evidence that tacitly developing the oral language of a linguistic community does not by itself enable an individual to segment phonemes; however, "the ability to

hear spoken language as a sequence of phonemes is, at least in part, a by-product of experience with an alphabetic orthography" (Hodgson, 1992, p. 97).

If developing phonemic awareness lies in extracting phonemes from the speech chain, are adult learners of English without alphabetic first language literacy and who come from logographic orthographies handicapped in their ability to segment phonemes?

The following descriptions of two important studies provide worthwhile evidence in the search for answers to this question. The results of a study from the People's Republic of China by Read, Zhang, Nie, and Ding (1986) concluded that Chinese adults literate in Pinyin and Chinese characters outperformed Chinese adults literate only in Chinese characters on phonemic segmentation tasks. Read et al. concluded that phoneme segmentation develops in the process of learning to read and write alphabetically. Holm and Dodd's (1996) study extended the work of Read et al. and was the first inquiry that tested the phonemic awareness skills of second language adult learners of English who have logographic orthographies in L1 and compared them on the basis of alphabetic first language literacy.

Subjects were nonnative speakers of English from Hong Kong, the People's Republic of China, and Vietnam, and native speakers from Australia. All subjects had completed a minimum of one year of university in Australia. Subjects

from the People's Republic of China had learned Pinyin and, therefore, had developed alphabetic first language literacy; subjects from Hong Kong had learned only the Chinese characters without the help of a transition alphabet. The results on the phonemic segmentation task, which included one-to-one phoneme-to-grapheme correspondences, one-to-many phoneme-to-grapheme correspondences as well as nonwords, showed that the Hong Kong subjects' performance was significantly inferior to the Chinese and Australian subjects'. The subjects from the People's Republic of China with training in Pinyin outperformed the subjects from Hong Kong, who had no alphabetic first language literacy, on phoneme segmentation, spoonerisms, rhyme detection, and spelling. On the basis of these studies, adult learners of English who lack alphabetic first language literacy may face greater challenges in developing phonemic awareness in English.

Since the ability to consciously segment phonemes, a "meta" process, depends on firstly having developed an unconscious automaticity of the phonological code of English, an "epi" process, are adult learners of English who come from logographic orthographies with no alphabetic first language literacy further disadvantaged in their ability to segment phonemes in English when they are faced with learning oral and literacy skills concomitantly?

Gombert's (1992) extensive collection of research that forms the basis of his model of metalinguistic development provides an answer to this question and advances a practical teaching method for instructors in the field of second language education. Learners must first gain automaticity of linguistic knowledge by modelling the language in an attempt to develop stable epilinguistic control, that automatic unconscious control. Providing learners with ample opportunities to rehearse and practise language, which can be contextualized for a classroom activity, further assists in developing epilinguistic control. After the learners have gained automaticity at this unconscious level, it is then appropriate for the teacher to highlight the rule or procedure that underlies the language activity. By highlighting the rule or procedure after the "epiprocess" is automatized, the learner can bring this automated unconscious control to an conscious "meta" level. Therefore, Gombert cautions language teachers against explaining procedures that the learner has not gained epicognitive control over. Viewed within the framework of Gombert's model of metalinguistic development, the learner is best served when linguistic knowledge builds from a stable foundation at the epilinguistic control phase--a necessary prerequisite to attaining metacognitive status.

> The teacher's action must aim at the establishment and stabilization of the corresponding epicognitive knowledge. This is essentially performed by the means of the manipulation of objects (linguistic objects being the ones which interest us here) whose rules of functioning correspond to the rules which will later have to be mastered at a conscious level. (Gombert, 1992, p. 195).

Gombert's (1992) model provides support for the need for adult learners of English to be provided with the opportunity to learn oral skills prior to the introduction of literacy skills.

Although the Holm and Dodd (1996) study did not discuss the results of their study in terms of metaphonological development, the mean percentages achieved by language groups on a phoneme segmentation task provide evidence that the Hong Kong subjects, who lack alphabetic first language literacy, had not acquired metaphonological control in relation to the words and nonwords presented in this task. Hong Kong subjects achieved 36.9 percent in comparison to the Chinese and Australian subjects who achieved 89.9 and 84.6 percent respectively. A score of at least 80 percent would generally indicate mastery with stable epiphonological control underlying the "metaphonological" or phonemic awareness skills. The results achieved by the Hong Kong participants suggest that oral language practice and training in phoneme-to-grapheme correspondences would be beneficial in developing their phonemic awareness skills.

The Holm and Dodd (1996) phoneme segmentation task requires subjects to analyze the internal composition of words and nonwords. This is particularly important for subjects who speak Chinese for a number of reasons. Peking Mandarin, the official language of the People's Republic of China, has approximately 405 basic monosyllables which are traditionally divided into an initial and a final (Ramsey, 1987; Norman, 1988). Adding four tones to most of these monosyllables produces around 1200 syllabic distinctions (Ramsey, 1987). In this language, every morpheme is represented by a syllable with a single consonant as the initial, and the remainder of the syllable as the final.

Likewise, Cantonese, which is spoken by the majority of residents in Hong Kong, has an initial and final but differs from Mandarin in that it has nine basic tones (Ramsey, 1987). Chinese can also be considered "phonologically monosyllabic" as each syllable is "a kind of self-contained entity which forms the basis of its phonological description" (Ramsey, 1987, p. 138).

> The syllable *huang*, for example, has *h-* as its initial and *-uang* as its final. If a syllable has no initial consonant at all and instead begins with a vowel, it is said to consist entirely of a final; *ang*, for example, is such a syllable (Ramsey, 1987, p. 42).

In view of the composition of words in the Chinese language, providing a segmentation task that requires Chinese and Hong Kong subjects to note all the phonemic constituents in each word or nonword should provide a clear

representation of the subjects' ability to consciously segment the sounds of English. A segmentation task that would require Chinese or Hong Kong subjects to note only the beginning or final sound in a word or nonsense word would appear to be less accurate based on the descriptions of the oral languages of Mandarin and Cantonese.

Interestingly, the Hong Kong subjects' performance on the spoonerisms (60.5 percent), rhyme (63 percent) and spelling of real words (81.6 percent), although below the performance of their Chinese counterparts, can still be considered a respectable performance. However, these scores are in sharp contrast to their performance on the phoneme segmentation task, 36.9 percent, and the spelling of nonwords, 23 percent, when compared to the Chinese subjects who scored 89.9 and 60.2 percent on the same tasks. The Hong Kong subjects' inferior performance on the phoneme segmentation task necessitates that another inquiry into the phonemic awareness skills of this language group be made using the lists of words and nonwords from the Holm and Dodd (1996) study.

Other factors in the segmentation task of the Holm and Dodd (1996) study require that a further investigation be made. Firstly, three lists of eight words, increasing in number of sounds, were presented orally. By orally presenting the words and not recording them onto a tape, which would have ensured that each subject received exactly

the same pronunciation of the words and nonwords, the results are left open to criticism. Secondly, each subject received the same order of presentation from the stimulus lists. Thirdly, three practice items from each list were given but the researchers do not identify them. The researchers do not indicate whether these practice items, that were taken from each list, were also presented again during the phoneme segmentation task, and if they were, whether the results of the second presentation of these practice words were included in the results. Fourthly, an investigation into the length of time subjects used and studied Pinyin was not correlated with the performance of subjects from the People's Republic of China. Fifthly, no attempt was made to determine if subjects who learned oral English language skills prior to learning literacy skills performed better on the phoneme segmentation task than those subjects who learned oral and literacy skills concomitantly. These oversights necessitate that the task be administered with stricter controls in place.

Therefore, the present study will institute stricter controls to test this hypothesis:

> Chinese adult learners of English as L2 from Hong Kong, who have L1 logographic orthography with non-alphabetic first language literacy, will have limited phonemic awareness in contrast to populations of (a) adult learners of English as L2 from the People's Republic of

China, who have L1 logographic orthography with alphabetic first language literacy, and (b) native monolingual English learners on a phoneme segmentation task.

Chapter III

Method

Subjects

The subjects for this study were drawn from two community colleges in the Lower Mainland of British Columbia. Seventy-three nonnative speakers were from College A and five nonnative speakers were from College B. Table 1 categorizes the nonnative speakers by country of origin and course level.

Table 1

Nonnative Speakers

Subjects	Advanced ESL	College Preparatory	College Level	Total
Hong Kong	7	17	4	28
People's Republic of China	16	33	1	50
Total	23	50	5	78

Of the five nonnative speakers from College B who were enrolled in college level courses, three had Test of English as a Foreign Language (TOEFL) scores at the 550 plus level, and one had an English Language Assessment (ELA) score at the 160 level. However, one nonnative speaker was admitted to first-year college courses based on past business experience. Discussions with instructors revealed that the

student was performing as well as the other nonnative speakers in the class who had TOEFL scores of at least 550 and who had participated in this study. These five nonnative speakers were colleagues of the native speakers who participated in this study.

The remainder of the nonnative speakers had completed the English Language Assessment and were placed into advanced ESL classes or college preparatory classes based on this assessment, or were promoted to advanced or college preparatory levels based on their completion of the prerequisite courses taken at the same institute. Discussions with program coordinators indicated that all nonnative speakers who were enrolled in advanced or college preparatory classes were assigned to the appropriate course level based on testing. Students are only advanced when they pass a set of tests in each of the five skill areas: reading, writing, listening, speaking, and grammar. Classroom teachers agreed that the students were appropriately placed in course levels based on the performance standards of all students who are assigned to these courses. If instructors feel that a student has been inappropriately placed in a course, the student is reassigned to another course level within the first week of the start of classes.

The English Language Assessment is a two and 1/2 hour comprehensive assessment, designed by Vancouver Community

College, which tests the following skills: reading vocabulary, reading comprehension, listening comprehension, written composition, oral interaction, and grammar. This assessment is designed to test English language ability ranges from the intermediate to the university level. The English Language Assessment is accepted by Vancouver Community College, Capilano College, British Columbia Institute of Technology, and Kwantlen College for acceptance into advanced ESL courses as well as post secondary courses and programs. The English Language Assessment is reported to have a total test reliability of over .90 which indicates that as a test battery, it is internally consistent (VCC, 1990).

Students who enter College A from other countries or other institutes must achieve a minimum score of 105/200 on the English Language Assessment in order to be accepted into college preparatory courses and a score between 90 - 104 to be placed in advanced ESL courses. Individuals scoring above 145 on the English Language Assessment are ready "to undertake a full college load in courses when the medium of instruction is English" (VCC, 1990, p. 17).

Students who are promoted from the advanced classes to the college preparatory level from within the institute must achieve a grade equivalent of 7 on the Gates-MacGinitie Reading Test. The Gates MacGinitie is a standardized reading test designed to test children's reading ability.

Using this standardized test for adult learners' of English seems inappropriate. Since this test was not designed for adult learners of English, it would not take into account their different levels of general cognitive ability nor would it take into account that English is not their first language. Furthermore, requiring only a grade 7 equivalency in reading for advancement to beginner level college preparatory courses seems to be quite low for the demands of college preparatory reading courses. The students' results on the Gates-MacGinitie make up 50 percent of their score with 30 percent assigned to a midterm exam and 20 percent assigned to class work which includes vocabulary and comprehension quizzes. Students who achieve a minimum of 62 percent overall are promoted from Lower Advanced to Upper Advanced classes and students who achieve a minimum of 70 percent are promoted from Upper Advanced to College Level.

Two groups of nonnative speakers were selected for this study: (1) nonnative speakers from the People's Republic of China who had learned Pinyin as children and (2) nonnative speakers from Hong Kong who had no alphabetic literacy in L1.

The thirty-three native speakers who participated in this study and were from College B. They were monolingual speakers of English, were enrolled in first-year college courses and had graduated from high school in Canada with the exception of one subject who had grade 12 equivalency.

Subjects were informed about the study by their classroom teacher or the researcher and, on the basis of the information presented, agreed to volunteer for the study.

All subjects were selected on the basis of having had no difficulty in acquiring literacy skills in their first language. Subjects self-reported this information on the questionnaires used for this study. Table 2 provides a breakdown of subjects by country of origin and gender.

Table 2

Subjects

Country of Origin	Male	Female	Total
Nonnative Speakers			
Hong Kong	13	15	28
People's Republic of China	17	33	50
Native Speakers			
Canada	12	21	33
Total	42	69	111

Procedure

Each subject was given a collated package that included a copy of the consent form, questionnaire, and instruction sheet, which are included in the Appendix. This ensured that each individual subject's consent form and questionnaire would be kept together and the subjects could

freely move on from the consent form to the questionnaire, etc. Once the researcher explained the purpose of the study, she then reviewed the consent form with the subjects. Subjects then completed and signed the consent forms. The subjects then completed the appropriate questionnaire, based on their status as a native or nonnative speaker of English. While subjects were completing the questionnaires, the researcher walked around the room making herself available to answer questions and encouraging subjects to ask questions about any items on the questionnaires of which they were uncertain. After the questionnaires were completed, the researcher reviewed the instruction sheet which included six examples of the categories of words and nonwords that would be presented on a tape. Subjects were encouraged to ask questions about any of the examples. The instruction sheet included two practice items for real words with a one-to-one phoneme-to-grapheme correspondence (e.g., fit, dent), two practice items for real words with a one-to-many phoneme-to-grapheme correspondence (e.g., should, taste) and two practice items for nonwords with a one-to-one phoneme-to-grapheme correspondence (e.g., sogic and pomk). Following the review of the information sheet, the subjects submitted their packages, which included the consent form, questionnaire, and instruction sheet. Submitting the instruction sheet prior to the phoneme segmentation task ensured that the subjects would be relying on their

knowledge of phonemes and not relying on the instruction sheet to assist them with the phoneme segmentation task. In addition, submitting the collated package enabled the subjects to focus their attention on listening to the audio tape presentation of the words and nonwords and recording their responses onto an answer sheet. (See Appendix E for a copy of the answer sheet.)

Three word sets were recorded in a sound proof sound studio using high quality Sony recording equipment. Set A contained randomly ordered real words with a one-to-one phoneme-to-grapheme correspondence; Set B contained randomly ordered real words with a one-to-many phoneme-to-grapheme correspondence; and Set C contained randomly ordered nonwords with a one-to-one phoneme-to-grapheme correspondence. Each word or nonword was presented twice with a three-second pause between a word and its repetition followed by a five-second pause before the presentation of the next word or nonword. The original recordings of these sets were then copied onto three tapes with the order of presentation for each group of real words and nonwords ordered to ensure that the presentation of words and nonwords would be counterbalanced: Tape 1 ABC; Tape 2 BCA; Tape 3 CAB. Feedback from participants indicated that the words/nonwords on the tapes were clearly enunciated. The tapes were not stopped at any time during the phoneme segmentation task. Only one subject submitted a partially

completed answer key (approximately 40 percent complete) and was therefore withdrawn from the study.

Measure

Phoneme Segmentation Task

Subjects analyzed the internal composition of words at the phonemic level by identifying the number of constituent sounds in each word or nonword presented by listening to an audio tape presentation of the list of words and nonwords shown in Table 3. The tapes were played on a high quality Panasonic Portable Stereo CD System (RX-DT55). Subjects recorded their responses on an answer sheet by placing a check mark in one of the boxes for each of the sounds in each word or nonword. Table 3 lists the words and nonwords used in this study as well as by Holm and Dodd (1996), as adapted from Dodd, Sprainger and Oerlemans (1989).

Table 3

Words and Nonwords Presented as Auditory Stimuli

1:1	1:Many	Nonwords
it	out	og
on	itch	ap
pet	white	zeg
big	cake	lek
swim	ocean	klon
frog	plate	vist
stamp	friend	stelp
robin	whistle	oskad

The phoneme segmentation task was administered to subjects in groups. Completing the consent form, questionnaire, and segmentation task took approximately 35 minutes for nonnative speakers and approximately 15 minutes for native speakers. The nonnative speakers' questionnaire was four pages in length, whereas the native speakers' was only one page in length. The researcher explained the reason for the study to the subjects and emphasized that their participation in the study was important to the researcher but they could choose to decline to participate.

Data Collection

College Preparatory Subjects

Although students from the People's Republic of China and Hong Kong were targeted as subjects for this study,

three teachers preferred that the phoneme segmentation task be given to all students in their classes, as this would be less disruptive. One teacher allowed the students who didn't fit the subject profile for this study to take a break while the subjects from Hong Kong and the People's Republic of China participated. Another teacher preferred that the five subjects who fit the subject profile be taken to an adjacent resource room so that the rest of the class could continue on with their work. The five remaining teachers scheduled my visits to their classrooms at the end of the sessions so that other students who did not fit the subject profile were able to leave. All students with the exception of two who fit the subject profile participated. The two who were not able to participate cited appointments that they had to get to as their reason for not being able to participate. On average, each group of ESL students that participated in this study was comprised of approximately six students, with the exception of the three classes where the teachers preferred that all students participate. All nonnative subjects participated in this study in their regular classrooms with the exception of five subjects from one classroom who were taken to an adjacent resource room. Data collection for the nonnative speakers took place over a four day period. Five morning classes were assessed over two consecutive days, three afternoon classes were assessed over two consecutive days, and two evening classes were

assessed over two consecutive days. Students enrolled in college preparatory classes attend class on average five hours a day from Monday to Thursday. All college preparatory subjects were enrolled in combined skills classes which emphasize the skills of listening, speaking, reading, writing, and grammar.

Advanced ESL Subjects

Two data collection sessions were held on the same day. One was held for the morning classes and one for the evening classes. The co-ordinator of the advanced classes arranged for the college boardroom to be available for the morning group of participants and a classroom to be available for the evening group. Approximately twelve students attended each of the two sessions. Students who agreed to volunteer came to the assigned room to participate. Students enrolled in advanced courses attend classes for approximately 2.5 hours each day. All advanced subjects were enrolled in combined skills classes which emphasize the skills of reading, writing, listening, speaking, and grammar.

Native Speakers

Native speakers who were enrolled in computer classes and who volunteered for this study came to an adjacent classroom that they use regularly for lecture courses to participate in the study. Native speakers who were enrolled

in academic courses and who participated in this study stayed in their classroom for this research activity. Each group of native speakers averaged approximately 15 students per group. Data collection for the native speakers took place over a three-day period.

Scoring

Each subject received a score of 1 for each word or nonword if the correct number of phonemes was counted and a score of 0 if the number of phonemes was counted incorrectly. The maximum score for each phoneme counting task (One-to-One Words, One-to-Many Words, and One-to-One Nonwords) was 8.

Tape Distribution

Tapes 1, 2, and 3 were randomly assigned to the groups of participants. However, the number of subjects who received each tape was not evenly distributed due to the restrictions that the researcher had to confront in terms of individual teacher's and department's preferences for accessing the pool of potential subjects.

Table 4

Tape Distribution

Subjects	Tape 1	Tape 2	Tape 3	Total
Hong Kong	11	7	10	28
People's Republic of China	16	22	12	50
Native Speakers	13	13	7	33
Total	40	42	29	111

Chapter IV

Results and Discussion

Subject characteristics for each group are shown in Table 5. It can be seen that the Hong Kong subjects had approximately four more years of English literacy exposure than their counterparts from the People's Republic of China. This difference in English literacy exposure was noted in the Holm and Dodd (1996) study also: The Hong Kong subjects in that study had approximately 5 more years of English literacy exposure than their colleagues from the People's Republic of China. English literacy exposure includes the number of years that subjects studied English and/or the number of years of study where the medium of instruction was English. This includes studying in their native country, in Canada, or in other countries.

Table 5

Subject characteristics for each group

Subjects	Mean years	SD
Hong Kong		
Age	30.0	11.4
English literacy exposure	11.1	4.6
Residence in Canada	3.0	1.9
People's Republic of China		
Age*	29.8	4.8
English literacy exposure	7.3	3.6
Residence in Canada	3.2	2.6
Canada		
Age	25.5	6.9
English literacy exposure	14.2	.7
Residence in Canada	25.0	6.6

**Please Note: One subject from the People's Republic of China did not report her age.*

The means and standard deviations for each subtest are shown in Table 6. The means are also presented in Figure 1. As expected, the native speakers from Canada outperformed all others. More importantly, the subjects from the People's Republic of China outperformed the Hong Kong subjects. These conclusions were confirmed by statistical analyses.

Table 6

Mean correct responses (M) and standard deviations (SD) as a function of country of origin and type of subtest

	Country						
	Hong Kong		People's Republic of China		Canada		
Measure	M	SD	M	SD	M	SD	Overall Mean
One:One	4.6	1.2	6.1	1.6	6.9	2.0	5.96
One:Many	3.6	1.6	5.0	1.8	5.3	1.7	4.76
Nonwords	3.0	1.2	4.9	1.4	6.5	1.9	4.94
Overall Mean	11.3		16.0		18.8		

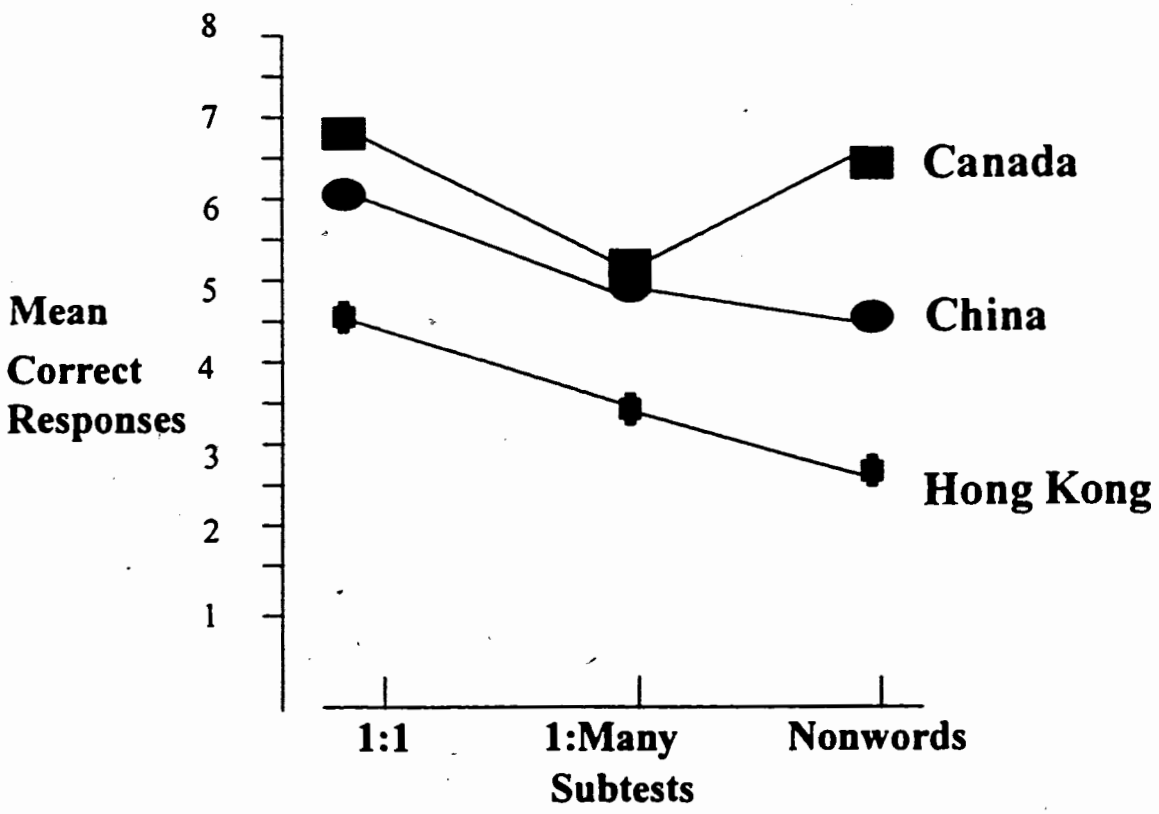

Figure 1. Mean correct responses as a function of country of origin and subtest.

Preliminary Analyses of Variance (ANOVAs) indicated that neither the order of tape presentation, ($F_{2,108}$=.118, p>.889), nor gender, ($F_{1,109}$=.895, p>.346) had any significant effects. In addition, another ANOVA indicated that there was no effect by course level on the total of the subtests for nonnative subjects ($F_{5,72}$=.453, p>.810).

The main analysis was a 3 (Country: Hong Kong, the People's Republic of China, Canada) X 3 (Subtest: One:One, One:Many, Nonwords) ANOVA, the first being a between- and the second a within-subject variable. There was a significant main effect of country of origin ($F_{2,108}$=26.8, p<.001), a significant main effect of subtest ($F_{2,216}$=27.14, p<.001), and a significant interaction ($F_{4,216}$=4.33, p<.003).

To analyze the interaction, three separate 2 X 3 ANOVAs were conducted. The first compared the Hong Kong and the People's Republic of China groups only. The main effect of Country was significant ($F_{1,76}$=30.97, p<.001), as was that of Subtest ($F_{2,152}$=20.84, p<.001). The interaction was not significant ($F_{2,152}$=.83, p>.436). As is obvious from Figure 1, the group from the People's Republic of China outperformed the Hong Kong group by about the same on all three subtests.

The second 2 X 3 ANOVA compared the group from Canada with the group from the People's Republic of China. The main effect of Country was significant, ($F_{1,81}$=8.26, p<.006), as well as that of Subtest ($F_{2,162}$=24.68, p<.001). The

interaction was also significant ($F_{2,162}$=5.66, p<.005). As can be seen from Figure 1, the Canadian group was only slightly better than the group from the People's Republic of China on the One:One and One:Many subtests, but very much better on the Nonword subtest.

Individual comparisons using the Tukey HSD method confirmed that the group from Canada and the group from the People's Republic of China did not differ significantly on the One:One, p>.133, and the One:Many, p>.654 subtests, but did so on the Nonword subtest, p<.001. Finally, the third 2 X 3 ANOVA compared the Canadian with the Hong Kong group. The main effect of Country was significant, ($F_{1,59}$=49.35, p<.001), as was that of Subtest, ($F_{2,118}$=14.80, p<.001). As can be expected from Figure 1, the interaction was also significant, ($F_{2,118}$=7.21, p=.001). As in the previous analysis, the meaning of this interaction is that the difference between the Canadian group and the Hong Kong group was much greater on the Nonword subtest than on the other two subtests.

The finding that Hong Kong subjects performed worse on all three subtests than the subjects from the People's Republic of China, who were performing at a lower level than the Canadians, suggests that the Hong Kong subjects, with nonalphabetic first language literacy, had limited phonemic awareness on this phoneme counting task when compared to subjects who had alphabetic first language literacy. This

result parallels the outcome of the Holm and Dodd (1996) study. However, in the present study, the subjects from the People's Republic of China whose performance is at a lower level than the Canadians is in sharp contrast to the Holm and Dodd study where the equivalent group outperformed the Australians.

All three groups' scores dropped on the One:Many subtest. This trend also occurred in the Australian study. However, in the present study the Canadians performed best of all, with the group from the People's Republic of China performing at a lower level than the Canadians and the Hong Kong subjects performing at a significantly lower level than the subjects from the People's Republic of China on the One:Many subtest. This contrasts with the Australian study in that the subjects from the People's Republic of China significantly outperformed the native Australians on this subtest (82% versus 62%, effect size=1.6). Nevertheless, the lower scores on this subtest indicate that subjects can be misled by the number of letters in a word. Interestingly, the word which most frequently mislead the native speakers to miscount the number of phonemes was the word `itch', which half of the Canadian subjects counted as three phonemes in contrast to the Chinese subjects who generally correctly counted this word as having two phonemes. The effect size for the corresponding comparison in the present study is 1.02. Omitting three outliers from

the group of native speakers who had achieved total scores of 5, 7, and 7, produced an effect size of 1.7 which is similar to the effect size of the Australian study.

The Nonword subtest is a good indicator of phonemic awareness as the subjects cannot rely on orthographic information. The low performance of the Hong Kong subjects on the One:One subtest indicates that they lack phonemic awareness skills which resulted in a correspondingly low performance on the Nonword subtest. The Hong Kong subjects appear to apply a strategy that prevents them from accurately detecting phonemes. Other studies have noted that students in Hong Kong are taught the "look and say" method of learning English; this method may result in the inferior performance of students from Hong Kong in phonemic awareness tasks since this method of instruction would not facilitate the development of phonemic awareness skills (Holm & Dodd, 1996; Huang, & Hanley, 1994).

The data show that for subjects from both the People's Republic of China and from Hong Kong the One:One subtest was relatively the easiest task, the One:Many subtest was of intermediate difficulty, and the Nonword subtest was the most difficult. In addition, the Hong Kong group performed worse than the group from the People's Republic of China on all three subtests. Furthermore, in comparing all three groups, the Nonword subtest best reveals differences in phonemic awareness among subjects from Canada, Hong Kong,

and the People's Republic of China, as this subtest is able to separate the native speaker from the Chinese speaker. The One:One and One:Many subtests did not significantly distinguish between native and Chinese speakers.

Since the present study had approximately three times the number of subjects than the Australian study, the results of the present study appear to be more realistically representative of the three groups' performances than the Australian study. The present study ensured that all subjects received the same pronunciation of the words and nonwords by providing a tape-recorded presentation. The study from Australia did not record the stimulus lists on to audio tapes; therefore, there is no guarantee that each subject received the same pronunciation for each word or nonword. The present study recorded the word, whistle, as /wIsl/ and the word, white, as /wayt/. These two words have other acceptable pronunciations such as /hwIs^l/ /wIs^l/ for whistle and /hwayt/ for white.

Interestingly, of the 50 subjects from the People's Republic of China that learned Pinyin, 25 reported that Pinyin was helpful in learning English primarily in terms of assisting with pronunciation, providing exposure to Roman letters, and aiding spelling. Conversely, 17 subjects reported that Pinyin did not help in learning English and 8 subjects made no comment to the statement, "If you did learn

Pinyin, please comment on how learning Pinyin may have helped you to learn English."

The length of use of Pinyin among subjects from the People's Republic of China did not correlate substantially with the results of the three subtests as noted in Table 7.

Table 7

Correlation Matrix

	One:One	One:Many	Nonwords
Length of Use of Pinyin	.136	-.002	.110

This lack of correlation may suggest that knowing Pinyin is the important factor that distinguishes the subjects from the People's Republic of China from the subjects from Hong Kong and that the length of time Pinyin is used is irrelevant. The study by Read, Zhang, Nie, and Ding (1986) noted that three subjects who were no longer fluent in Pinyin were able to add and delete phonemes very successfully. This suggests that the length of use of Pinyin may not be all that important. As Read et al. noted "the segmental conception acquired with alphabetic literacy may persist even when the literacy itself is dormant" (p.41).

On the nonnative speakers' questionnaire, subjects selected from one of the following statements to describe their experience learning English: (a) I learned to speak English before I learned to read and write English. (b) I

learned to speak, read, and write English at the same time. (c) I learned to read and write English before I learned to speak it. The researcher included this question to determine if nonnative speakers who learned to speak the language prior to learning to read and write it would perform better on the three subtests than the subjects who learned to speak, read, and write English concomitantly or who learned literacy skills prior to oral skills. However, only six subjects, all from the People's Republic of China, reported that they learned to speak English before learning to read and write the language. The performance of these six subjects on the three subtests was close to the mean scores. Sixty-four percent of the subjects from Hong Kong and fifty percent of the subjects from the People's Republic of China reported that they learned to speak, read, and write English concomitantly. Thirty-six percent of the subjects for Hong Kong and thirty-eight percent of the subjects from the People's Republic of China reported that they learned to read and write English before learning to speak the language. As shown in Table 8, the nonnative speakers' experience learning English did not correlate with the results of the three subtests.

Table 8

Correlation Matrix

	One:One	One:Many	Nonwords
Experience Learning English	.081	-.118	-.052

The general conclusion of this study is echoed in the results of previous studies by Morais, Cary, Alegria, and Bertelson (1979) and by Read, Zhang, Nie, and Ding (1986) in that alphabetic literacy in L1 boosts phoneme segmentation skill.

Chapter V

Conclusions

The purpose of this study was to investigate the hypothesis that subjects with logographic backgrounds and who lack alphabetic first language literacy would have limited phonemic awareness on a phoneme counting task in comparison to (a) subjects who had developed alphabetic first language literacy and were also from logographic backgrounds and (b) monolingual native speakers of English. The study focused its investigation on phonemic segmentation skills through a phoneme counting task because phoneme segmentation is an important skill for reading proficiency as it enables the reader to apply phoneme-grapheme correspondences. The results of this study support the hypothesis and demonstrate that subjects from the People's Republic of China who have Pinyin are better able to count phonemes on real words that contain one:one and one:many phoneme-grapheme correspondences and on nonwords that contain one:one phoneme-grapheme correspondences than the Hong Kong subjects. This finding mirrors the results of the Holm and Dodd (1996) study where subjects from the People's Republic of China were found to be far superior to the Hong Kong subjects on all three categories of words. However, in

the present study the native speakers outperformed the Chinese subjects in all categories. This contrasts with the Australian study where the subjects from the People's Republic of China significantly outperformed the Australian subjects on the one:many subtest and matched them on the nonword subtest.

The present study improved on the Holm and Dodd (1996) study in a number of ways. It included significantly more subjects, randomized and counterbalanced the order of presentation of the subtests, determined whether the length of use of Pinyin was a factor in the results, provided six examples of practice items that were not included on the three subtests, and tape recorded the subtests for presentation to subjects. The Holm and Dodd study orally presented the words and nonwords to subjects individually. Two of the words on the One:Many subtest can be pronounced a number of ways. For example, whistle can be pronounced /wIsl/ /hwIs^l/ or /wIs^l/ and white can be pronounced /hwayt/ or /wayt/. Interestingly, the consonant sequence, /hw/, seems to be disappearing completely in the English-speaking world, making words like `wear' and `where', `which' and `witch' homophonous, according to Gramley and Patzold (1992). However, the Holm and Dodd study did not include the number of phonemes for the words `whistle' and `white'; therefore, it is uncertain whether the initial consonant in `whistle' was pronounced /hw/ or /w/ and

whether the ending was pronounced with the vowel + consonant + schwa + /l/ as in /wIsˆl/ or whether the ending was pronounced with a syllabic /l/ as in /wIsl/. Tape recording the three subtests would have ensured that each subject received the same pronunciation. Furthermore, words that have only one recognized pronunciation for inclusion in the One:Many subtest would have simplified the interpretation of the results. Words such as `should' `doubt' `subtle' and `licked' would have eliminated the complication of varied pronunciations. Clearly, dialectal differences play a role in the pronunciation of the subtests. Nevertheless, tape recording them, as the present study did, provided subjects with consistent pronunciation and equipped the researcher with an accurate key to the scoring and interpretation of the results.

Although phonemic awareness requires the acquisition of the alphabetic principle and the automation of phoneme-grapheme correspondences, it appears that only the native speakers have developed mastery of these principles on the One:One and Nonword subtests. Neither the subjects from the People's Republic of China nor the subjects from Hong Kong achieved mastery on any of the three subtests even though the subjects from the People's Republic of China achieved an overall score of 67 percent in comparison to the Hong Kong group's score of 47 percent. The results of the native speakers indicate that they as a whole have acquired stable

epiphonological control of the phonological code of English which in turn resulted in their being able to accurately apply a "meta" process to the counting of phonemes. Conversely, the results of the subjects from the People's Republic of China and Hong Kong indicate that they have not developed stable epiphonological control of the phonological code of English. Their inability to accurately count phonemes indicates that training in decoding skills as well as listening and speaking practice may assist them in developing stable epiphonological control of the phonological code of the English language. Developing stable epiphonological control is a prerequisite to developing metaphonological control--the conscious, controlled application of knowledge (Gombert, 1992). Clearly, without the acquisition of stable epiphonological control, there will be a corresponding lack of metaprocesses. The results of the nonnative speakers in this study support this claim. As Gombert's model of metalinguistic development purports, metaprocesses can only be acquired subsequent to the acquisition of epiprocesses.

The nonnative speakers' lack of automaticity of phonemic awareness skills is mirrored in an obvious lack of metaprocesses, which are reflected in their performance on the three subtests in this study. This lack of metaprocesses provides educators in the field of English language teaching with opportunities to promote the

development of phonemic awareness skills that have been shown to be crucial to the development of reading and spelling achievement (Eskey, 1988; Liberman, Shankweiler, & Liberman, 1979; Bradley & Bryant, 1983; Williams, 1980, Bradley, 1988). Gombert's model of metalinguistic development provides a sound basis for advancing a teaching method for the development of phonemic awareness skills in the field of second language education.

In an attempt to gain epilinguistic control, learners must first gain automaticity of linguistic knowledge. Therefore, learners need ample opportunities to practise and rehearse the language to assist in developing epilinguistic control. The teacher can model the language and provide opportunities for language practice and pattern drills thereby enabling the learner to begin to gain epilinguistic control--that automatic, unconscious control. Proceeding from pattern drills to contextualizing the information presented, the teacher can then advance to highlighting the rule on which the pattern drill is based. Here is an example of pronunciation practice: The teacher can prepare a collection of minimal pair drills which differ in one sound-letter combination such as (1) thank and (2) tank. Learners of English often substitute the stop, /t/, for the fricative /0/. The English language is one of the few languages that have this fricative, which has been known to cause pronunciation problems for students and which can also

lead to difficulties in comprehension. The teacher can begin by modelling the pronunciation, pointing to a word while pronouncing it thereby demonstrating the contrast in sound. The next step is for the teacher to point to the words while the student pronounces. Then the student can point to a particular word while the teacher pronounces followed by the teacher pointing to a particular word while the student pronounces. Another alternative to this suggestion is to have students determine if the words that contrast in one sound are the same or different. The words should then be contextualized offering the student additional pronunciation practice. The students should be encouraged to discover how the sounds differ in terms of where the articulators are placed in the mouth to produce these sounds. This allows the student to highlight the rules of pronunciation and consciously apply the procedures for pronunciation; for example, placing the tip of the tongue between the teeth while letting the air move out of the mouth for the pronunciation of /0/. Supplementing pronunciation practice with spelling practice would assist in mastering phoneme-grapheme correspondences. Other teaching techniques that can assist with the development of phoneme-grapheme correspondences are to provide dictation as well as oral reading practice. Providing opportunities for students to both dictate and transcribe chunks of oral texts will afford additional listening, speaking, transcribing,

and decoding practice. Moreover, continued practice in oral and silent reading should provide for improvement in phoneme-grapheme correspondences. These simple teaching suggestions can ensure that linguistic knowledge builds from a stable foundation at the epilinguistic control stage, the prerequisite to metalinguistic development. Training in phonemic awareness allows learners to phonologically process and analyze new words, equips learners with the skills necessary to approximate the pronunciation and spelling of new words--all of which are desirable for users of the English language (Holm & Dodd, 1996).

The results of the present study confirm that students who are learners of English as a second language can be enrolled in advanced levels of English training and still lack fundamental phonemic segmentation skills. Educators should not assume that students enrolled in advanced levels of English training and who can read and write in English have developed phonemic awareness. It is only through explicit instruction that these learners who are enrolled in advanced English language classes and who lack phonemic awareness skills will be afforded the opportunity to develop and improve their skills in this area. Gombert's (1992) model of metalinguistic development offers a practical technique for doing this.

A further study that would institute phonemic awareness training for subjects who scored poorly on the phoneme segmentation task and compare them on a pretest prior to training followed by a comparison of scores on a posttest after the institution of a training program would add to the body of knowledge regarding the benefits of phonemic awareness training. The present study did not correlate the performance on the phoneme segmentation task with reading ability. Several studies had already been constructed to explore this premise and have determined that phonemic awareness is indeed a solid predictor of reading achievement (Mann & Liberman, 1984; Mann, 1986; Lundberg, Frost, & Petersen, 1988; Liberman, Liberman, Mattingly, & Shankweiler, 1980; Stanovich, Cunningham, & Cramer, 1984; Tunmer & Bowey, 1984; Liberman, Shankweiler, Fischer, & Carter, 1974).

The present study focused on only one aspect of phonemic awareness: phoneme counting. Although the present study did not include phoneme addition, deletion or blending tasks, factor analysis of the commonly used measures of phonological awareness suggests that measures of phoneme blending, counting, reversing phonemes and segmentation all appear to measure a "single construct or underlying ability" rather than multiple or unrelated skills (Wagner & Torgesen, 1987, p. 202). Additionally, the subjects who participated in this subject were matched on their assessed levels of

English proficiency; they were not matched on any measure of general academic ability.

The results of this study suggest that the way the phonology of the English language is acquired in Hong Kong warrants investigation. In addition, the methods used to teach English in this country should be observed and compared to methods used in other countries such as the People's Republic of China to determine if the teaching methods are the cause of the differences observed in this study and in the Holm and Dodd (1996) study. Furthermore, reviewing textbooks and teacher resources used to teach English in the People's Republic of China and Hong Kong could provide some insights into the results of this study and how students are exposed to the English language in educational settings in these countries. Nevertheless, the present study's primary interest was the investigation of the use of Pinyin as a factor in the acquisition of phonemic segmentation skill. The results do suggest that learning Pinyin has a beneficial effect in developing phonemic segmentation skill in English. In conclusion, it may not be "literacy in general but alphabetic literacy in particular that leads to phonemic segmentation skill" (Read, Zhang, Nie, & Ding, 1986, p. 41).

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Appendix A

INFORMED CONSENT FORM

Studies carried out by Universities in Canada need consent forms signed by the people taking part. This is to make sure that everyone understands what is going to happen.

Consent

1. I agree to take part in this study, and I am doing this voluntarily.

2. I understand that the researcher for this study is Mary Giovannetti-Seward, a teacher at Capilano College and a graduate student at Simon Fraser University, who has the support of Capilano College and Vancouver Community College to do this study. This study is in partial fulfilment of Mary's Master of Arts degree. The purpose of this study is to compare how well adult learners of English from the People's Republic of China who have learned Pinyin are able to separate or segment the sounds in English words and nonwords when compared to:
(a) adult learners of English from Hong Kong who have not learned Pinyin and (b) native monolingual English learners.

3. As part of the study, I will need to complete:

   - this consent form
   - a short questionnaire about how long I have studied English, my level of education, what is my first language, etc.
   - a short assessment that will require me to listen to words and nonwords that are recorded on a tape and to check off on an answer sheet the number of sounds that I hear in each word or nonword. A nonword is a group of sounds that are unfamiliar as a word in English.

   I understand that my participation in this study will take approximately 35 minutes and will be extremely helpful to Mary.

4. I understand that Mary will not use my real name or the name of the colleges when she writes up the results of her study.

Consent Form
Page 2

5. After the study has been written, all participants' questionnaires and assessments used in this study will be destroyed to keep all information confidential.

6. When the study is completed, I can obtain a copy by telephoning Mary at Capilano College. Her number is 986-1911 local 2373.

7. I understand that I can withdraw from this study at any time.

8. If I have any complaints about Mary or the study, I can contact Dr. Robin Barrow, Dean, Faculty of Education, Simon Fraser University, Burnaby, BC, telephone number 291-3148.

Name: (please print) _____

Address: _____

_____

Signature: _____

Witness: _____

Appendix B

RESEARCH QUESTIONNAIRE - NONNATIVE SPEAKERS

1. Name:

2. Age:

3. Sex: ☐ Male or ☐ Female

4. Please complete the following statement by placing a check mark (✓) next to the appropriate category:

I am .....

____ an international student

____ a landed immigrant

____ a refugee

____ a Canadian citizen

____ other; please specify: _____

5. Native country:

6. What is your first language?

7. Place a check mark (✓) next to the total number of years you attended school and university in your **first** language?

☐ up to 5 years

☐ 6 to 10 years

☐ 11 to 15 years

☐ more than 15 years

8. Did you have any difficulty learning to read and write in your **first** language?

☐ Yes or ☐ No

9. What other languages besides your first language and English do you speak, read, and write?

_____ _____

_____ _____

10. How many years have you studied English in Canada?

____ years

11. How many years did you study English in countries other than Canada?

____ years

12. If you studied English in countries other than Canada, please list them.

_____ _____

_____ _____

13. How many years have you lived in Canada?

____ years

GO ON TO PAGE 3.

14. Place a check mark (✓) next to the level of courses that you are now studying in English:

_____ ESL Intermediate Level

_____ ESL Advanced Level

_____ ESL College Preparatory Level; please specify:
1. the number of years you have studied at the College Preparatory Level: _____ years
2. the standardized test you had to pass to get into College Preparatory courses: _____

_____ College Level (regular mainstream courses); please specify:
1. the number of years you have studied at the College Level: _____ years
2. the name and level of course or program you are now enrolled in: _____
3. the standardized test you had to pass to get into College Level courses: _____

15. Place a check mark beside the statement that best describes your experience learning English.

_____ I learned to speak English before I learned to read and write English.

_____ I learned to speak, read, and write English at the same time.

_____ I learned to read and write English before I learned to speak it.

_____ Other; please specify: _____

_____

COMPLETE THE REMAINDER OF THIS QUESTIONNAIRE ONLY IF YOU ARE FROM THE PEOPLE'S REPUBLIC OF CHINA OR HONG KONG.

16. Did you learn Pinyin as a child in your native country? (Pinyin is an alphabet that is taught to children in the People's Republic of China before they learn the Chinese characters.)

☐ Yes or ☐ No

17. If you did learn Pinyin, place a check mark (✓) next to the length of time you **studied** it.

_____ up to 3 months

_____ 4 - 6 months

_____ 6 - 12 months

_____ longer than 1 year; if longer than 1 year,

please specify how long: _____

18. If you did learn Pinyin, place a check mark (✓) next to the length of time you **used** it.

_____ 1 - 2 years

_____ 3 - 5 years

_____ 6 - 8 years

_____ 9 - 10 years

_____ longer than 10 years: if longer than 10 years,

please specify how long: _____

19. If you did learn Pinyin, please comment on how learning Pinyin may have helped you to learn English?

_____

_____

_____

_____

RESEARCH QUESTIONNAIRE - NATIVE SPEAKERS

1. Name:

2. Age:

3. Sex: ☐ Male or ☐ Female

4. Native country:

5. Is English the only language that you fluently speak, read and write ?

☐ Yes ☐ No

6. What is your highest level of education?

☐ Grade 10 or Grade 11

☐ Grade 12

☐ completed one to two years of college or university

☐ completed three to four years of college or university

☐ have at least one degree

7. Did you graduate from high school in Canada?

☐ Yes ☐ No

8. How many years have you lived in Canada?

_____ years

9. Did you have any difficulty learning to read and write English?

☐ Yes or ☐ No

NAME: _____

Instructions: **You will hear a combination of words and nonwords. A nonword is a group of sounds that are unfamiliar as a word in English. Place a check mark (✓) in one of the boxes for each of the sounds you hear in each word or nonword.**

Example #1: The word, fit, is made up of three sounds: /f/ /i/ /t/. A check mark ✓ would be placed in the first three boxes to represent the three sounds in the word fit.

Example #2: The nonword, pomk, is made up of four sounds: /p/ /o/ /m/ /k/. A check mark ✓ would be placed in the first four boxes to represent the four sounds in the nonword pomk.

Example #3: The word, taste, is made up of four sounds: /t/ /a/ /s/ /t/. A check mark ✓ would be placed in the first four boxes to represent the four sounds in the word taste.

Example #4: The word, should, is made up of three sounds: /sh/ /u/ /d/. A check mark ✓ would be placed in the first three boxes to represent the three sounds in the word should.

Example #5: The nonword, sogic, is made up of five sounds: /s/ /o/ /g/ /i/ /c/. A check mark ✓ would be placed in the five boxes to represent the five sounds in the nonword sogic.

Example #6: The word, dent, is made up of four sounds: /d/ /e/ /n/ /t/. A check mark ✓ would be placed in the first four boxes to represent the four sounds in the word dent.

HAND IN THIS INSTRUCTION SHEET BEFORE WE START THE EXERCISE ON SEGMENTING SOUNDS IN WORDS AND NONWORDS.

TAPE # _____ NAME: _____
(Please print your name.)

PART 1									
1.	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.	☐	☐	☐	☐	☐	☐	☐	☐	☐
4.	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐	☐	☐	☐	☐
6.	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.	☐	☐	☐	☐	☐	☐	☐	☐	☐
8.	☐	☐	☐	☐	☐	☐	☐	☐	☐

PART 2									
1.	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.	☐	☐	☐	☐	☐	☐	☐	☐	☐
4.	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐	☐	☐	☐	☐
6.	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.	☐	☐	☐	☐	☐	☐	☐	☐	☐
8.	☐	☐	☐	☐	☐	☐	☐	☐	☐

PART 3									
1.	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.	☐	☐	☐	☐	☐	☐	☐	☐	☐
4.	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐	☐	☐	☐	☐
6.	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.	☐	☐	☐	☐	☐	☐	☐	☐	☐
8.	☐	☐	☐	☐	☐	☐	☐	☐	☐