Review Studies on L1 and L2 Phonic versus Whole Word Teaching Methodology from English as L1 to English as L2

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Abstract
Researchers interested in the pedagogical point of view propose that phonological awareness enhanced by suitable instruction methods will facilitate word reading, and that this even applies to readers with Chinese as L1 who can then, in fact, learn English as L2 more successfully as a result of it. The purpose of this review study is to continue further investigate the truth of the orthographic depth hypothesis as opposed to theories which allow for both phonological and visual/graphic processing to occur in reading words in any writing system and for possible effects of instruction on word reading. Our review work looks at studies on L1 and L2 word reading, their similarities and differences, specifically in relation to different instructional backgrounds, highlighting the role of phonological awareness. The whole word approach and phonics teaching will be contrasted first in English word reading teaching and then specifically between the Hong Kong and Taiwan school settings.

Key words: Orthographic Depth Hypothesis, Writing system effect, Phonics teaching methodology, Whole word teaching methodology, Phonological Awareness
1. Introduction

Among the world’s writing systems, the Chinese logographic system is often regarded as a mark contrast to alphabetic systems such as English. In view of their very different nature on grapheme-phoneme correspondences (GPC), word reading has been presumed to differ radically for English and Chinese readers. It is noted in Chwo (2007) concerning the observation that the strong orthographic depth hypothesis (ODH) views word reading as constrained by orthographic difference, such as Chinese writing system, deep orthography should only resort to graphic visual route and shallow one via phonological route, however, the weak ODH acknowledges the role of phonological processing even in the deep orthography. This was echoed by the present form of Dual Route Model (DRM), Dual-Route Cascade (DRC) as well as Parallel-Distributed Processing Model (PDP) which challenge such dichotomy processing by proposing phonological processing or activation, which is available to all when appropriate instruction was given to readers.

The approach is further contrasted when we see the strong ODH considers readers as being exclusively subjective to external factor, writing system effect (WSE), to do the word reading; while the weak ODH is strikingly similar to the class of DRM. The role of instructional effect is not only compatible with DRM, but also identified with PDP which involves both internal as well as external factors in word reading experience, that is, readers’ cognitive processing is available for both orthographic and phonological factors to be interactively processed when exposed to teaching methodology that is appropriate for such learnability. Here we see instruction serves as an external effect that supports and facilitates such reading experience in PDP as well as in the new form of DRM, DRC. According to the strong ODH, the meaning-only processing of the Chinese logographic system is determined by the nature of that system, a suggestion that ignores and excludes cognitive processes employed in reading which might themselves be affected by instructional methods (Perfetti & Zhang 1995, Taylor & Olson 1995). Supposing the cognitive processes involved in reading are ‘universally’ available and sensitive to instructional effects, they may well be manipulable in readers irrespective of their orthographic background. Indeed, cross-linguistic experiments have found that phoneme awareness as a result of explicit instruction can be present among children who are readers of non-alphabetic orthographies (Mann 1991).

In Scholfield & Chwo’s study (2005), they have the advantage of access to Hong Kong and Taiwan, where two contrasting teaching methods for word reading (recognition) both in L1 Chinese and L2 English are adopted in their individual educational systems. Furthermore, there is uniformity in the L1 as well as L2 writing systems that are used. Thus no artificial settings are involved in this study, and subjects of a comparable age group, the sixth grader of elementary school, also were able to be contrasted. Thus a valid result was identified in the study where a comparative study was conducted on Hong Kong and Taiwan’s sixth graders’ word reading processing and the result shows that the phonology
emerges as playing a role in reading both English and Chinese words. This remains true even in Hong Kong where sound similarity words slow judgements considerably in contrast to the ’same word’ distracters. Furthermore, phonic versus whole word instruction also have an effect on the level of phonological versus graphic activation in the word reading process and that words in parallel for the same subjects reading in two different writing systems, that is, Chinese as L1 and English as L2 with the former as deep and the later as shallow, and hence supposedly differentially favouring degree of access to phonology.

In order to inform such a unique instructional effect, we will firstly illustrate in English as L1 and then specifically to Chinese as L1. If such an instructional effect is available to general readers’ cognitive processing despite of WSE, where Chinese orthographic-phonological correspondence is opaque compared to English, it is rightful for us to define and illustrate such instructional effect in detail so as to supply a rationale for a consequence of such effect to exist in our Chinese groups.

2. L1 and L2 word reading and teaching methods

Reading is considered an artificially acquired skill influenced by differences in teaching environments. Studies of the instructional methods used in the acquisition of reading have confirmed that beginning readers’ approach, the way they process words when reading, can be substantially influenced by different teaching methods (Barr 1974, Seymour and Elder 1986).

Instructional method here is understood as referring to a set of external events designed to facilitate an internal learning process of which two important aspects are often specified: the first is the type of learning outcome, which in our case is primarily the type of processing the reader favours, with phonological awareness (PA), whether greater or lesser involvement of phonology; and the second is a speculation concerning the factors that determine the events of learning, or factors that make a difference as a result of the instructional effect, which we will illuminate from our discussion below of the two main methods used. These factors include those that are deliberately planned and arranged as environmental stimuli so as to support the learner’s cognitive processes and also any type of intervention intended to engage learners’ cognitive processes and to promote desired learning outcomes (Gagné 1985, Schunk 1991). Bruner (1966), a developmental psychologist, regards instructional effects as consequences of learners’ exposure to a systematic instruction method. In relation to L1 and L2 word reading, we observed that both readers’ internal cognitive processing and external instructional factor have been involved and taken into consideration in PDP as well as DRC.

In the context of the above, we shall first briefly introduce and explore two main types of word reading teaching methodologies, phonics and whole word teaching, descriptively in order to further illustrate aspects of word reading processes that result from distinct instructional methods as opposed to being a product of a writing system effect. Here we shall
initially focus on English as L1 in contrasting these word teaching methods and later on Chinese as L1.

2.1. The phonics and whole word teaching methods used for L1 English

Generally speaking, there are two widely used methods for teaching word reading to beginning readers: the phonics and the whole-word methods (the latter is also called the ‘look-and-say’ method). These two methods are fundamentally different in their principles and approaches to classroom instruction (Fries 1963, Pennington 1996). The phonics method, as it is used with shallow orthographies, adopts a linguistic emphasis (Bloomfield & Barnhart 1961) based on the existence of GPC rules and seeks to teach sound-spelling correspondences. It involves considerable practice with rhyming, segmentation and blending of sound patterns to establish correspondences with general spelling patterns (Tunmer & Iversen 1993, Lewkowicz 1980). This facilitates word reading in units, defined as clusters of graphemes in a given environment which have an invariant pronunciation according to the rules of English (Gibson 1965). Furthermore, phonics instruction focuses on associating words, which have sounds in common and on the different sequential positions of sounds in a word in order to increase the PA of readers in recognizing sound patterns (Bradley & Bryant 1983, 1985). Examples can employ phonograms with the common elements in word families e.g. ‘fine’, ‘fun’ and ‘fire’ so children are able to learn phonological recoding skills via onset initial consonants in groups of words; initial consonant clusters such as appear in ‘club’, ‘clown’ and ‘close’; and intrasyllabic phonological units such as onset and rime or via the vowel together with any following consonants like ‘band’, ‘hand’ and ‘sang’ (Thompson & Nicholson 1999). The characteristic of this teaching is the provision of explicit and systematic training in phonological recoding skills, so that learners will develop self improving strategies to acquire letter-sound correspondences for word reading. By contrast, the whole word teaching method is an approach based mainly on attempting to directly establish meaning associations with written words and often the sound shape as an undivided whole as we will describe it later in Hong Kong (§2.2.). Accordingly, it emphasizes instructing students to recognize individual words by the shape of the whole word as a visual unit, without breaking lexical items into individual graphemes.

The difference between these methods has been characterized as ‘linguistically decoding oriented’ versus ‘language oriented’ in that the first method instructs explicitly on relations between the component letters and phonemes of words. This emphasis is absent from the second method. Hence, when an unknown word is met, the phonics approach is to attack it from word-internal clues in the spelling, while the whole word method mainly relies on context to lead to meaningful learning of new words without any segmentation (Ellis 1993).

As observed, the decoding method in phonics teaching is intimately associated with PA, strictly a separate ability from reading, which is defined as the capacity to reflect upon and manipulate the sound structure of words, and can be
assessed in a variety of tasks which include asking whether or not two words rhyme, whether or not two words have the same initial sounds (phonemes), and testing pronunciation of words from which sounds are removed, e.g. what is left if you remove the ‘s’ from ‘stable’ (Morais et al. 1986). The ‘language oriented’ or ‘word method’ approach, being more directly linked to context, is often assessed using cloze techniques with a picture present in the place where key words are omitted in, say, every sixth or tenth position in a passage and learners have to guess the right word taking account of the illustration in connection with the nature of the passage (McCullough 1972, Fries 1963). We now turn to considerations of advantages and disadvantages of the two methods briefly introduced above.

The PA resulting from phonics teaching is claimed to be a reliable predictor of reading and literacy development (Bradley & Bryant 1983, Byrne & Fielding-Barnsley 1993, Gathercole et al. 1991, Tunmer & Chapman 1993, Williams 1980). Word reading instructed by phonetic method displayed via tests of PA, and their results had shown that PA is predictive of improvement in reading achievement (Morais 1991). This claim has been evaluated using a variety of reading tasks, such as sound-to-word matching, word-to-word matching, recognition or production of rhyme, pronouncing of an isolated sound in a word, pronouncing in order the sounds corresponding to the phonemes in words, counting phonemes, blending phonemes, deletion of a phoneme from a word, specifying which phoneme has been deleted and phoneme substitution (Lewkowicz 1980). Others have relied on phonemic segmentation tasks, phoneme manipulation tasks, syllable-splitting tasks, blending tasks, oddity tasks and knowledge of nursery rhymes (Adams 1990). The validity and reliability of phonemic awareness tests had been further investigated in Yopp (1988) and conducted among 96 kindergarten children. A total of ten phonemic awareness tests were carried out in relation to reading novel words. The results generally support the reliability of such tasks holding predictive validity for the initial steps in reading.

However, the different degree of difficulty to carry out the different type of phonemic task was recognized, e.g. phoneme blending is found to be the easier phonemic awareness tests for young readers compared to phoneme deletion task. Other than that, side effect on tests of PA, e.g. oral identification of the separate sounds of a word, is not the same as a test of reading ability or processing.

In contrast, learners instructed by the whole word teaching method are expected to rely on identifying the visual shape of a word as a whole, and on context clues without decomposing into sound or graphic segments. Practice emphasizes reading words in the context of the syntax and semantic cues in sentences to infer a word and integrate its meaning in a broader context. Arguments against the phonics method have maintained that explicit and systematic instruction in GPCs is unnecessary since overemphasis on trivial phonological segmentation skills will lose the whole picture of ‘reading for meaning’ in context. It is also presumed, in support of the whole word method, that GPCs will be naturally developed when learning to write, and it is therefore, unnecessary to waste time on this in initial reading instruction.
given the many irregularities that are present in English orthography, too much focus on GPCs may impede and confuse learners rather than facilitate learning. In opposition to the whole word teaching methodology, it has been claimed that what is achieved via phonics instruction is actually crucial for whole word teaching method. Tunmer & Chapman (1993, p12) say: “children should be encouraged to look for familiar spelling patterns first and to use context only as back-up support to confirm hypotheses about what the word might be.” Evidence has indicated that little progress will be made in learning to read unless a child is able to first achieve a reasonable level of phonological recoding ability, the ability to translate letters and letter patterns into phonological forms (Adams & Bruck 1993). This ability depends on the phonological representation and related information stored in working memory being accumulated so as to facilitate meaningful comprehension. Therefore, if children, with English as their L1, have problems in identifying an individual word in a text, they might encounter confusion which will further increase comprehension difficulty when they are reading in a broader context. In fact, children who rely mainly on visual graphic cues without training in PA have been found to experience progressive deterioration in the rate of reading development as they grew older (Bruck 1992, Byrne et al. 1992). This is supported by Adams & Bruck (1993, p130):

> “Without the mnemonic support of the spelling-to-sound connections, the visual system must eventually become overwhelmed: the situation in which these children are left is roughly analogous to learning 50,000 telephone numbers to the point of perfect recall and instant recognition.”

Comparatively speaking, the phonics method is now considered more suitable than ‘look and say’ for English in that ‘look and say’ treats the English writing system as if it were a non-alphabetic system like Chinese, requiring the child to learn the recognition of thousands of separate, unanalyzed word forms (Carroll 1972, 1978). On the other hand, PA, combined with phonics teaching, predicts successful reading. This is indicated by readers’ ability to relate their spoken forms to unfamiliar written forms in an alphabetic writing system. Some research has shown that the ability to segment linguistic units such as phonemes, syllables, and words plays a crucial role in beginning reading in English, and low ability readers are found to be less successful at using GPC rules in their word reading (Bradley & Bryant 1983, 1985, Farmer et al. 1976, Gleitman & Rozin 1977, Goswami & Bryant 1990, Liberman 1971, Liberman et al.1980, Shankweiler & Liberman 1989).

A general criticism of the whole word method is that it ignores the role of individual components in word recognition and the acquisition of skills in decomposing word-units into their separate graphic components based on GPC rules. The existence of a distinct instructional effect has been investigated in a two-year intervention study carried out by Williams (1980), applying an explicit phonic teaching method to learning disabled children. The results showed that these instructed children were able to decode novel combinations of letters that were not presented in training. An experimental investigation of instructional
effects was also conducted comparing 60 four-to-six-year old children exposed or not exposed to phonic instruction methods. It was found that generally those who experienced a phonic training method were able to do better on sound blending tests and a distinction was reported, especially for five to six year old children, who performed better on subsequent reading tasks, than children without such training (Farmer et al. 1976). This supports an early study on the relative effectiveness of phonics teaching versus whole word approach by Chall (1967), who first investigated on a large scale of teaching methods and reports via systematic organized category by differentiating and grouping studies based on grade level matched with the measurement outcome. A distinct pattern was observed in that one group received phonics teaching and the other the look-and-say method: an apparently equivalent result was demonstrated at the initial reading stage; however, after a period time of instruction, the phonics group not only in the end “caught up with but surpassed their look-say peers in silent reading rate, comprehension, and vocabulary by the end of the second grade (Adams 1990, p38)” The phonics teaching method, also was identified a coding approach instruction, was further found to enable those who were categorized as low intelligence level readers to achieve better in reading (Chall 1967, Williams 1979).

Generally speaking, we concluded that the former teaching method, phonics, requires attention to sound, while the latter, whole word method does not. However, it is also noted that teaching PA in general is not restricted to teaching GPC rules alone, but can be inclusive of such correspondence. The distinction is more that the former requires analysis of the written word into letter sequences, which are matched with sounds, while the latter treats the word as a whole, matched to a whole word sound representation. Furthermore, most studies here look at effects on reading ability and do not actually measure the kind of processing used by learners when reading as a result of the distinct teaching method, instead by correlation to separate reading tasks or intelligence test, of which operation had been improved in Scholfield and Chwo’s study (2005). Lastly, we observed that the word reading processing under two teaching methods in English as L1 in effect corresponds to PDP and DRC with respect to the PA which improves and predicts word reading progress phonologically, also shows that even within an alphabetic system such as English as L1 can be affected by distinct teaching method, whole word instruction, so as to result in visual graphic processing as deep orthography, such effect was not predicted by the strong ODH. However, in order to enable us to further differentiate such WSE in contrast to instructional effect, we now turn to a deep orthography such as Chinese to investigate such contrast.

2.2. L1 and L2 teaching methods background in Hong Kong and Taiwan primary schools

The major challenge faced by Chinese teachers at the initial reading stage is to get the children to pronounce the characters correctly in the first place before proceeding to achieve meaningful comprehension of the characters. This is in view of the fact that children are normally possessed with vocabulary in their
spoken form before they receive the formal instruction; therefore, teachers are required to teach word reading by bridging children’s spoken language to their corresponding written forms to achieve literacy. This is regardless of the places since teachers see phonology as needing to be accessed ‘pre-lexically’ via different teaching methods and neither of any type of word reading instruction regards it as of any value to go direct from visual shape to meaning, like the lexical route of DRM. Indeed that is to be expected since children learning to read in L1 are most often meeting in writing for the first time words which they already know very well in their spoken form. However, the approaches used in teaching word reading differ between Hong Kong and Taiwan (Taylor & Olson 1995). The contrast in teaching methods can be clearly observed in Hong Kong and Taiwan primary schools where both places adopt a uniform version of written Chinese as the eventual target for reading in the L1 and also teach the English writing system in the context of L2 instruction. Though different spoken languages, Cantonese and Mandarin, are used in Hong Kong and Taiwan respectively, a single writing system has been adopted in both places as the official written language, which is generally used to write the various Chinese dialects (Jackson et al. 1995). This uniform writing system, normally associated with Mandarin, is used in the school setting even though Cantonese is the spoken language in Hong Kong. Hong Kong, like Taiwan, uses the system of written characters 繁體字 (FánTǐZì), ‘complicated characters’, sometimes called ‘traditional characters’, which are different from the simplified characters 簡體字 (JiǎnTǐZì) used in P.R.C. In reality, students in Hong Kong do not study their own spoken language either as a grammatical system or as a vehicle for written expression (Chan 1987, Johnson & Swain 1997). Accordingly, it is appropriate to regard Cantonese as a system mainly used for oral communication as well as in general media communication but not as a vehicle of literacy in reading in the educational context2. Returning to the point on the difference existing between simplified and traditional writing systems, it was briefed in Canadian Overseas Chinese Affair Service Website (2008) that traditional characters in average

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1 There have been a number of concerted efforts to create an “alphabetic phonetic” writing system via Pinyin in P.R.C. China. The reform carried out by Chairman Mao (1940-1967) expressed the ambition of bringing the written language closer to the people. The propaganda on language reform emphasized phonetization as a guideline for the new national Pinyin policy. The effect of this movement promoted the idea of replacing original graphic components in characters by romanised phonetic symbols. However, this replacement has not happened in Taiwan where traditional characters are still normally used. Rather, Pinyin is taught alongside the characters from an early stage, and so provides in P.R.C. somewhat similar effects of PA raising as does ZYFH in Taiwan. This implementation effect on the writing system leads to the simplification or replacement of original Chinese graphic composition by phonetic symbols, an ‘economy of writing effort’ movement (Leong 1986).

2 Children in Hong Kong schools are not taught to do reading based on their spoken language expression but on Modern Standard Mandarin Chinese written form. When they do reading in the classroom context, though a Cantonese pronunciation is used to read the character, when writing or reading in the school, children must adopt a Standard Chinese word order. They must also avoid Cantonese lexical items that have no standard Chinese cognate (Fu 1987). However, the morpheme based nature of Chinese written language enables people of different dialects to communicate and be understood via a uniform writing system even though their spoken forms are mutually unintelligible. This mutual intelligibility cannot be achieved in alphabetic or syllabic writing systems where pronunciations are constrained by GPC rules and written versions of the dialects would be correspondingly mutually incomprehensible to one another. This unique feature of the Chinese writing system has also been recognized as a drawback for various proposals to alphabetize written Chinese (Hoosain 1995).
composed of 9.15 numbers of stroke; while simplified character is estimated to be 7.67. That means, there are 1.48 stroke differences in between. The original semantic cue, therefore, was lost and disconnected from the simplification process owning to the deduction of the strokes. Confusion arises when simplified character no longer provides reliable semantic cue from the graphic feature. Psycholinguistic experiments also present such discrepancy result due to the orthographic variation. Chwo (2007) contrasted two experiments by Perfetti & Zhang (1991) and Hoosain & Peng (1995) separately with the former adopting simplified and the later traditional characters. The result showed strong pre-semantic phonological priming effect activated in Hoosain & Peng’s (1995) but not in Perfetti & Zhang (1991)’s experiments. This was displayed as a result of long-term practice and learning the semantic association provided by reliable graphic and sound feature in the traditional characters, which was an absent element in simplified characters. Such effect was further identified in Chinese as L1 contrast ing Taiwan and H.K. six graders in Huang and Hanley’s (1994) study in §2.6, an instructional effect displayed as a result of PA training compared to those without.

Turning to L2, it is an increasing phenomenon to be like in Hong Kong, several primary schools in Taiwan, as well as kindergartens, had already incorporated English as L2 in their curriculum before it was institutionally sanctioned in all primary schools, though the process of such establishment also depends on the demands of the community and the availability of the teaching resource in school. Other primary schools in Taiwan have also followed up the current demands for L2 teaching in cooperation with transformations in curriculum planning. The goal is to promote English as a second language in the context of a school curriculum indicated in the national policy (Education Commission 2000, Johnson & Swain 1997, National Changhua Univ. 1999, National Kaoshiung Normal Univ. 1998, Lord & Cheng 1987).

Based on the above observations, we can conclude that in many respects the reading teaching situation in Hong Kong and Taiwan is similar with respect to both L1 Chinese and L2 English. We now focus on the discussion of the differences in teaching method in two locations in more detail, as we only know it in a very general and limited description from our sources, therefore, the main purpose of our own study is to confirm and extend in more detail of what the differences really are in both current teaching environments and how the exact situation actually affects their subjects to do the L1 and L2 word reading under contrast teaching method, which we believe also will shed light in future development in L1 and L2 instruction in both places.

2.3. L1 and L2 word reading instruction in Hong Kong

Word reading instruction in Hong Kong primary schools uses direct association via rote memorization of the word shape and its pronunciation without any reference to segments or medium of phonetic transcription, namely, the whole word method (Lee et al. 1986, Huang & Hanley 1994). To detail, L1 teaching is based on recognizing words by their whole shape without breaking
them down into individual graphemes or taking account of sound patterns. Teachers supply the direct association between new words and sounds, so the whole character is learnt as a basic unit and the learner acquires a character to pronunciation to meaning mapping without the mediation of an alphabetic system or other phonetic transcriptions (Holm & Dodd 1996). This method aims for children to decode meaning directly from the association of graphic shapes, and to apply what they have learned in the context of compound words to facilitate the comprehension and sometimes extend to the usage of the new word into the context of sentence making in order to enhance meaningful comprehension of the target words. In sum, words are taught in the context of either a compound word or a sentence, but never in segments, graphically or phonologically. The teaching of new words is subordinated to the broad context of the passage, generally based on the textbook syllabus to teach the content with simple statements of facts. The construction of teaching materials and oral explanation is to provide the background information to assist the readers’ understanding. This is in accordance with Hong Kong educational policy for L1, which is to ‘identify the Chinese equivalent of the content words (i.e. synonym), in a text and then construct a meaning around them’ (Johnson & Swain 1997, p177). This method meets the requirements of the syllabus and the public examinations. As a consequence, teachers spend most of their time illustrating word meanings by oral explanation via sentence making or story telling and sometimes by picture drawing. Learners under this whole word instruction have been presumed to resort to direct association between each character and its pronunciation, a type of rote learning students have to master from direct teaching. In fact, rote memorization has been identified as a traditional way of learning and studying among the Chinese population and is regarded as an important strategy to master among Chinese students (Liu 1986).

The above instruction method has been long established in the Hong Kong teaching curriculum and seems to provide Chinese beginning readers with a very straightforward way of acquiring word knowledge at an early stage via economic instruction without reference to GPC rules, and to achieve word recognition via an orthographic route. With the whole word teaching method pronouncing the word as a whole, it is expected that Hong Kong subjects (HKS), as a result of this, would resort to orthographic or lexical route and directly access to its semantics, a direct visual to meaning path presumed by DRM. On the other hand, Taiwan subjects (TS) would resort to phonological or non-lexical route as a result of phonic teaching employing ZhūYīnFúHào (ZYFH), which seems to be supporting a version of that route that PDP as well as DRC theorists would endorse, with phonology involved as a necessity when this instruction method is involved.

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3. However, the entrance exam was abolished in April 2001 according to the new policy updated by Educational Dept. of Hong Kong. This might exclude primary schools from school leaving exam in the near future (personal communication with the head teacher Miss Lee).
However, word reading might involve thousands of distinct characters being rote memorized before Chinese readers can reach a reasonably sophisticated reading proficiency, and beginning readers are confronted with the extra burden of remembering huge numbers of individual script-sound associations (Tzeng & Hung, 1981). The emphasis on whole word methods is supported by the observation that the function of the phonetic base in modern Chinese characters is unreliable for beginning learners since the writing system does not contain reliable phonetic cues. In compensation for the lack of orthographic-phonological correspondences in the writing system, repetitive reciting offers a natural method for aiding progress in word reading. Reading aloud then serves as an ancillary method in whole word teaching to enhance sound learning, and, perhaps to some extent, makes up for the absence of PA that often can be achieved in the context of alphabetical writing systems (Tzeng et al. 1977).

Turning now to English as L2, its role in HK is described in the following statement from Hsia (1994, p8):

“English is the dominant language in industry, commerce, tourism, official and public functions, Hong Kong learners are exposed to English as early as age three or four, but normally with little native speaker input and little training in sound and letter matching.”

English as a second language is instructed from kindergarten level in Hong Kong (Chan 1987, Johnson & Swain 1997), although it is not until secondary school that English becomes predominant across the entire curriculum except for Chinese Literature and History where Cantonese continues to be used for instruction. At the primary school level, L2 word reading is instructed using the same direct whole word teaching method as for Chinese, where each new word is taught in the context of a sentence. Teachers explain the meaning of the word by producing sentences orally, sometimes adding illustrations. Words are pronounced as a whole unit without any segmentation or mediation of phonetic transcription. The word is directly related to meaning via the whole word pronunciation when seeing the word shape. Exercises also put emphasis on using the new word in the context of a sentence with correct syntax. That is, new words are introduced, practiced and tested in the context of sentence patterns or passages for grammar translation, but never via GPC rules. As Hsia (1994, p8) observed: “The lack of training in sound and letter matching is very evident throughout Hong Kong, when English words are passed on as pieces of information” and again when “in the absence of or little knowledge of phonological coding via training in segmental analysis, students may well rely on visual memorization and on guessing from contextual cues and information to gain access to meaning when reading.”
2.4. L1 and L2 word reading instruction in Taiwan

In contrast to Hong Kong, L1 word teaching in Taiwan has adopted a phonic teaching method via a set of Chinese script phonemic symbols, ZYFH, which has been applied in L1 instruction since 1919. This set of standardized analytic phonemic symbols has been taught from kindergarten to primary school age so as to enhance children’s PA prior to and then alongside the reading of Chinese characters. ZYFH also known as (ㄅㄆㄇㄈ), the first four phonemic symbols of ZYFH, an analytic phonological symbol system used for beginning reading instruction. An example appears in Table (1):

(1) Traditional characters: 喜歡
IPA: [ɕ ihuan]
Pinyin: xǐ huān
ZYFH: ㄒㄧ ㄏㄨㄢ
Meaning: ‘like’

The purpose of this auxiliary transcription system is to facilitate and ease the learning of the sounds of characters (Taylor & Olson 1995). Unlike Pinyin in P.R.C., which uses the Roman alphabet, ZYFH was introduced with a unique graphic composition based on simplified traditional Chinese writing, a set of non-alphabetic symbols, without any resemblance to the Roman alphabet (Holm & Dodd 1996, Jackson et al. 1995, Leong 1986, Leong et al. 1987, Wang & Geva 2003). ZYFH comprises 37 symbols, which include 21 consonants, 3 medial and a retroflexed central vowel with other 12 vowels, together with 4 lexical tones, with consistent grapheme-phoneme correspondence and is used in primers for learning to read and spell L1 in Taiwan (Leong & Joshi 1997, Jackson et al. 1995, Huang & Hanley 1994). The pronunciation of Chinese characters can be represented by a minimum of one and a maximum of three symbols in ZYFH, but added to two to four if the tone is included. It is a long-standing official phonetic system designed exclusively for Mandarin Chinese character pronunciation to prepare children for word reading in the Taiwan primary school setting (Lee et al. 1986, Huang & Hanley 1994). This system clearly promotes reading with phonology involved as PDP and DRC describes in Chwo (2007), but in a more prominent way that the method used in Taiwan. In practical classroom instruction, students in Taiwan are first taught to master ZYFH without seeing the characters at all, and later move to link ZYFH phonological symbols to Chinese characters (Halliday 1981). This process of transition between exposure to ZYFH and characters continues through kindergarten up to the sixth grade children, at the age of around 12 or 13 years. Phonics instruction applied to word reading with Chinese as L1 is carried out via the mediation of ZYFH phonemic transcriptions, which focuses on the rhyming, segmentation, and blending of ZYFH phonetic symbols in order to facilitate the differentiation of homophones and homographs in relation to their ZYFH sound pattern. This instruction complies with official government policy and aims to increase learners’ PA via ZYFH phonemic symbols so that word reading can be achieved via phonological processing in a highly segmented form, even though there are no orthographic-phonological
correspondence rules to exploit to connect phonetic segments of words to parts of
the written character.

For English as L2, phonics teaching method is employed in Taiwan primary
schools (Cheng 1999) in contrast to the whole word method applied in Hong
Kong, the type we described above (§2.1.), where the segmentation and rhyming
of new words are the focus of L2 instruction. PA is enhanced via the above
phonics tasks with songs, games and specific activities employed in L2
instruction. L2 evaluation also tests GPC rules or sound patterns in word reading
sections with a variety of tasks (Rau et al. 1999, Rau 2000, Cheng 1999). This L2
method has been judged to be efficient in L2 word learning and has been strongly
recommended to be extended to secondary school L2 teaching (Huang 1999).

2.5. Summary

We have observed the absence of explicitly taught phonetic transcription as a
distinguishing characteristic in Hong Kong children’s L1 learning and the
absence of GPC training in L2. The policy of the Hong Kong educational
authorities emphasizes contextualizing the word as a priority in their curriculum
planning. Thus, providing information about the meaning of a word in general
contexts serves as guidance for the instruction method. As a result of this, L1
word reading instruction centres on the direct access to meaning from context; L2
teaching focuses on practicing new words in different grammatical sentence
patterns. In order to teach pronunciation, teachers implement reading aloud of the
target passage as a whole, so Hong Kong students mainly pay attention to the
comprehension of word meanings in context. Similarly, L2 word reading is
taught by sentence making and explanation of meaning. The purpose of this
method is to achieve whole word reading and recognition via context without
segmentation into sounds or graphic composition. In sum, children in Hong Kong
learn to read their L1 by direct pronunciation without any assistance of phonetic
training, and L2 without any training via GPC rules. Students mainly need to
copy whatever the teachers pronounce.

In contrast to Hong Kong, it has been pointed out that in Taiwan L1 and L2
word reading instruction is consistently implemented via phonics. L1 word
reading is taught via ZYFH phonetic transcriptions, which provide phonological
mediation at a segmental level; likewise, word reading in L2 is taught via phonic
teaching including of GPC rules also enhance PA.

As we established the comparability of two distinct teaching methods of
Chinese word reading in two places, it is concluded that PA as a result of
instructional effect marks the difference in readers’ word reading processing
among Chinese readers based on a uniform L1 and L2 writing system
background.

As we discussed in Chwo (2007) that word reading in DRM regards
alphabetic writing system such as English encouraging non-lexicon processing
via GPC rules, while deep orthography writing system such as Chinese can only
resort to lexicon route to access to its meaning where word reading is considered
as a by product of WSE. This was firstly reviewed in English as L1 where whole
Studies on L1 and L2 Phonic versus Whole Word Teaching Methodology from English as L1 to English as L2

word and phonic teaching was compared and the results correlated with its predictability of reading progress. In order to test on ODH based WSE, this contrast was further extended to Chinese as L1 where DRM predicts to be a straightforward processing via lexicon route. However, contrary to this view, an instructional effect illustrated by PDP as well as compatible with DRC was predicted to be present to all word reading processing which includes Chinese readers despite of its orthographic difference, as long as readers are exposed to instruction appropriated to their cognitive domain where universal phonological processing is facilitated to be interactively involved with their corresponding orthographic components. Under this circumstance, PA observed in Chinese as L1, as a result of phonic teaching method, namely, instructional effect, demonstrated in readers favouring phonological processing during word reading where orthographic-phonological correspondence is absent, supports and identifies universal phonological processing proposed in PDP and DRC, this, therefore, contradicts WSE proposed by the strong ODH.

Concerning the role of PA, an instructional effect of phonic teaching, which identifies in readers’ phonological processing in their word reading have been investigated specifically in Chinese writing system. There has been a great deal of work suggesting that the sort of differences in instruction methods described in this section can have significant effects on PA, which is crucial to identify readers word reading processing. In the following section, we shall briefly review a representative subset of this work.

2.6. Phonological awareness as an instructional effect

PA has been identified as a particular phonological processing ability that displays strong and consistent association with vocabulary acquisition as well as reading achievement during the early school years, but is it also associated with heightened pre-lexical access to phonology in the reading process, which is our concern as instructional effect. For the instance of English as L1 children at the age of four and five, were assessed by various types of phonological memory and rhyme awareness tasks, together with non-verbal intelligence and vocabulary tests, and it was found that the PA as a result of such training contributes to reading achievement after a year of reading instruction. Awareness of rhyme was particularly closely linked to reading development as revealed in a task involving segmenting spoken words (Gathercole et al. 1991). In general, acquisition of such phonological knowledge is apparent with learners who are trained to segment, blend, delete or isolate phonemes when doing word reading via GPC rules.

In the case of Hong Kong Chinese readers, Ho (1997) examined 47 Chinese second-graders, 7 to 8 years old, (who normally start learning word reading at the age of 3 without any aid of phonetic system like Pinyin used in P.R.C. or ZYFH used in Taiwan) from a representative primary schools in Hong Kong and found scores of PA tasks correlated significantly with Chinese word reading scores but not visual discrimination task. They suggest reading as a close connection between speech and reading, a universal phonological demand in reading available to any orthography “to recover the underlying phonological structure of
words to get the meaning through its sound in the spoken language” (Ho, op. cit. p217). This suggests that the phonological skills in early reading processing are not restricted to alphabetic languages but also potentially apply to non-alphabetic Chinese. However, neither of the above (Gathercole et al. 1991, Ho 1997) actually measured directly what happened when these subjects read (e.g. using Stroop or masked priming or pairs judgment or any method). They are simply assuming that if subjects score higher on PA tasks (which are purely oral based), then they must be appealing to phonology in the reading process, which in terms, makes them read better. In our studies, it is decided to get more directly at phonology in the reading process and not rely on indirect evidence of PA scores and reading ability scores.

With this application to Chinese as L1, it is crucial to examine such PA demonstrated in readers with such training in their instruction background, so as to examine their phonological processing in word reading. To investigate PA resulting from instructional effect, segmentation ability has again been researched in subjects who had Chinese as their L1. It has been maintained that marked differences between those who were and were not able to perform phonemic segmentation were related to whether they were alphabetically literate or not.

For instance, in Read et al. (1986), two groups of Chinese subjects from P.R.C. who were similar in their educational background and working experience but differed in age were compared. An alphabetic group (N=12) of adults were those who had learned Pinyin. Another non-alphabetic group (N=18) contained subjects who had not learnt Pinyin and were literate only in Chinese characters. Read et al. selected non-alphabetic subjects who had completed primary education before 1958, i.e. before Pinyin was introduced into primary school. This non-alphabetically literate group had received no Pinyin training in their school years, but the alphabetic subjects, generally younger, had learned Pinyin 27 years on average before the study took place. Both groups contained workers from all walks of life in Beijing. Except for age, the major difference between the groups, therefore, amounts to whether they had received alphabetic instruction in primary school or not. The researchers hypothesized that those who had been exposed to Pinyin would display better segmentation abilities, i.e. PA, than the non-alphabetic group. Segmentation ability was examined via the ability to conceive spoken words as sequences of phonemic segments and the ability to identify and locate segments within words and syllables.

The two groups were presented with 10 reading aloud trial tests to ensure that they were either able or unable to pronounce Pinyin on cards, i.e. this was purely to check that the two groups were differentiated as intended by knowledge of Pinyin. The experimental tasks, which were purely oral, i.e. pure PA tests, then required the addition or deletion of a single consonant at the beginning of a Chinese spoken syllable such as /a/, or /da/, or the addition or deletion of a single final nasal (or retroflex) consonant given such a syllable as /da/ or /dan/. Stimulus items also included non-words in Pinyin format, e.g. /dəŋ/, is a possible syllable in the phonological structure of Mandarin Chinese, but not /dʒəŋ/ which is a phonologically illegal word in Mandarin. All forms, then, were
possible syllables of Chinese and subjects were asked to respond orally when they received the stimuli read by the experimenter. Judgment of the answers was mainly carried out by two transcribers; in cases of disagreement, the judgment of a third transcriber was involved.

The results showed a significant difference in accuracy between the alphabetic and non-alphabetic groups (F=55.75, p<.0001). This was despite the fact that some subjects in the alphabetic group claimed that they were no longer fluent in Pinyin which they had learned in primary school, and that “they read words slowly and with difficulty” (Read et al., op. cit, p.41). They still demonstrated good performance on the segmentation tasks which demonstrated their ability to exercise phonological skills.

The study concluded that it is not about literacy but alphabetic literacy experience and the latter is what is important in segmentation skills. This conclusion is consistent with that drawn by Morais, et al. (1979) and Koda (1992,1994,1996,1997) that the phoneme awareness demonstrated in segmentation skills is probably an instructional effect resulting from learning to read and write in an alphabetic system as this study shows that instruction in Pinyin probably affects PA.

A further confirmation of the possible significance of instructional effects from Read et al.’s study was found in alphabetically illiterate subjects. During practice trials of the PA segmentation tests, the experimenter encouraged subjects to produce correct responses and repeated examples if necessary. Having received extra instruction and practice with a second set of trials, subjects who were alphabetically illiterate were able to perform the task much better. In fact, 13 of the 18 non-alphabetic subjects attempted the tasks a second time immediately after the first try, with a different phoneme target but the same operation. One subject improved on non-word targets from one item correct on the first try to all ten correct on the second. Read et al. (op cit, p39) attributed this to an instructional effect: “Evidently, given enough instruction and practice, some individuals can learn to do this task without alphabetic literacy.”

A reservation about the assessment employed in this study is that subjects could have performed the phoneme manipulation tasks without comprehending the word’s meaning, and for non-word tasks, without realizing that the target word was not a real word, since it was again an oral based experiment which does not involve comprehension in word reading. There is a lot of difference for us between a task that is a purely oral sound manipulation task (a measure of PA) and one with written input (a measure of the process of word reading/recognition). Taking account of the fact that Chinese contains a large number of homophones, subjects might have accessed the Pinyin alphabetic system on a purely phonological level, possibly just phoneme, bypassing the meaningful comprehension that word reading intends to achieve. However, what was uncontroversial in Read et al.’s. study was the demonstration of an instructional effect via a training process for subjects doing the test.

Hsia (1994a) reports instructional effects on the ability to segment speech
sounds and to display efficient word recognition for Cantonese–speaking subjects in Hong Kong who had learned Mandarin, with explicit training in speech segmental awareness via Pinyin. In this study, it was hypothesized that as a result of training in Mandarin segmental analysis, the transfer of PA would be demonstrated in subjects’ L1 Cantonese as well as their L3 English. To investigate this, 82 first year college students were selected to participate in the test, of which a group of 24 (L) were translation students and had undergone training in Mandarin Chinese segmental analysis with a great deal of auditory training. The remaining 58 students (NL) were from different majors (Business, Management, Computer Science and Electronic Engineering) and had followed a basic English course but had not received any training in acoustic phonetics nor in phonetic transcription.

All of the subjects were investigated individually using four main tasks: Table (2).

(1) Word and non-word naming task
(2) Phoneme segmentation tasks in English and Cantonese versions
(3) EngREPEAT and CanREPEAT task
(4) English dictation task.

For (1), subjects were presented visually with 20 words in English, e.g. ‘crystal’, ‘gentle’, ‘radar’, and 20 non-words, e.g. ‘feebate’, ‘padony’, ‘burnip’, and were required to name each word. For the non-words, the investigator particularly wished to discover whether subjects were able to read them, since such an ability would indicate that subjects had acquired some form of phonological coding skills, such as PA developed in L2 Mandarin Chinese as we intended to find out that also show greater segmental phonological processing ability in word reading in L3 English.

In (2), each test comprised a series of ‘word games’ with the subject first being asked to repeat a word presented orally by the investigator. Then the investigator explicitly segmented the word, e.g. light, into three parts [l-ai-t], and the subject was asked to sound out each segment accordingly. Following this, the experimenter provided the subjects with practice in providing the initial segment or segment of the word. For instance, the experimenter said [( )-ai-t] and asked the subject to supply the missing initial segment. What has been described up to now comprised a training period. Once the training was completed, the investigator moved on to experimental trials. For the English version, subjects were asked to display their segmental knowledge of both initial and final consonants in 16 English pseudowords. For the Cantonese version only initial consonants were tested. An example of the English version of the test is provided by the non-word shaps, where the experimenter presented either [( )aps] or [ a( )]… as the subject was requested to supply either the initial or final segment(s). Before this, the

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4 The final consonants are nonexistent in Cantonese except the nasal vowels and final stops. Please refer to A Chinese Syllabary Pronounced According to the Dialect of Canton by Huang (2000) for further reference.
subject would simply be asked to repeat the non-word. Here the aim is to see if subjects with greater PA developed in L2 Mandarin Chinese also show greater PA in L1 Cantonese and L3 English.

Hsia’s own description of (3) is very unclear. What seems most likely is that repetition scores were obtained as part of the procedure just described for (2), i.e. EndREPEAT and CanREPEAT tasks were not separated from the segmentation tasks. Hsia describes in a confusing way her procedures for calculating scores on repetition and, while the details are very murky, it seems that these procedures are designed to be charitable in allowing segmental errors in repetition to count as correct repetitions, so long as some knowledge of a segment (in initial or final position) as displayed, another PA test as (2).

In (4), 60 English words were presented in a dictation task to investigate subjects’ ability to identify liquids and nasals in writing when words are auditorily presented. The stimulus words varied in stress placement relative to the intervocalic consonant, e.g. ‘lemon’ which has initial stress, or ‘relate’ which has final stress. The hypothesis of Hsia’s study was that the NL group who had received only whole word training would have difficulty with the tests, since they lack phonological coding skills and would fail to exercise segmentation skills in the tasks. By contrast, the L group had received training likely to increase PA and should display sensitivity to the sound units and be able to perform better in segmentation tasks. Thus, Hsia predicts that learning to segment speech sounds via Pinyin will enable the L group to outperform the NL group in this range of tasks.

The results showed an overall group effect in all the tasks except for the non-word naming task, English segmentation task and dictation task for final stressed syllables. The (L) group in general appeared to be more sensitive to intraword boundaries and phonemic principles than the (NL) group. For instance, in the real word Naming task, the difference between the groups was significant at t (81)=9.08 (p<.001), which is of more interest to our study since it relates to word reading compared to all the other tasks since they seem to be pure PA tests. The word naming result also seems to show transfer effect, of course the reading measure is one of reading success apparently, and in the phoneme segmentation task, t (81)=-10.80 (p<.001). It was also observed that the impact of the transfer of segmental awareness via Pinyin training was slightly stronger in Cantonese (discriminating coefficient of .3481 in the segmentation task and .4666 in the repeat task) than in English (.3094 in the initial segment task, -.1345 in the final segment task and .2910 in the repeat task). An implicit acknowledgement of this appears in the author’s conclusion (p. 20) that “though training in Mandarin segmental analysis had clearly enhanced (L) subjects’ sensitivity to phonetic segments, these subjects will still need training in English morpho-phonological principles to do well in lexical decisions, word naming and dictation.” In other words, it is being suggested that the instructional effects are at least partly language specific, that means, Pinyin specifically facilitates Mandarin Chinese but may not be for English as L2 word reading where the structure of language needs to be drawn attention to its morpho-phonological principles other than GPC
rules. This contradicts PA transfer saying that alphabetical literacy alone account for PA when this should be addressed into a context of PA gained via phonic instructional effect.

A potential weakness with Hsia’s study is that she does not provide detailed information on how the Pinyin segmental skills were instructed and in what format they were presented. Beyond acknowledging that the L group had undergone training in Mandarin Chinese segmental analysis, the author simply points out that they are students of translation and interpretation without specific instruction on phonetic transcription. The author admits the lack of more adequate background information on the L group’s training, e.g. exact number of exposure hours to segmental training in Pinyin is unknown. She simply observes (p6) that “three months at college should reflect the transfer impact of their Mandarin segmental awareness training (even if not intensive)”. This absence of an independent assessment of Mandarin segmentation training that could be correlated with performance in the experimental tasks, raises question marks about the causal role of the training on the results.

It is also noteworthy that there were some major individual differences in the tests, despite the fact that the subjects’ Advanced Level Use of English Exam scores were analysed and no differences were reported. Additionally, interviews were carried out to filter subjects in the selection process in an attempt to obtain uniform subject groups. For instance, in the pseudowords repetition task (CanREPEAT task), the author reports that there were wider individual differences for the (NL) group than for the (L) group, SD 15.96 in contrast to 5.93. This was recognized as possibly attributable to individual variation within the group due to differences in their language training background per se. Similar individual variation was also found in the non-word naming task.

A variety of task effects which might affect the results are also discussed. For instance, the author found generally superior performance on word as opposed to non-word tasks and on initial phoneme segmentation compared to final phoneme segmentation tasks. The author admits that in order to perform these technical multi-faceted tasks involving auditing comprehension, speech production and segmentation, subjects were required to use multi-levels of phonological processing skills to achieve good results. It was also suggested that this might indicate some difficulty at the level of interaction between phonological memory and articulatory rehearsal. This was especially indicated by a large number of subjects failing to repeat pseudowords correctly on the CanREPEAT task in (3).

Lastly, in this study, it is not made clear whether the segmentation skills examined relate to word comprehension since significant differences were found between groups with and without training in segmental awareness only in their performance when comprehension was not required, i.e. either in word reading tasks like (1) that only required reading aloud or in tasks such as (2)-(4) which are either purely oral PA tasks, or at any rate do not involve reading. A complication is also raised by the operational skills required by the tasks, leaving open the question of how such segmentation skills effect can facilitate word reading.
comprehension, that is, how the transfer of such skills might relate to effective word reading in second language learning or to the actual way words are processed when doing the reading.

Another important cross-linguistic study looking at the aspect of PA training in learning to read Chinese and English was carried out by Huang and Hanley (1994). They compared the performance of 137 primary school children aged between 8 and 9 years old in the U.K. (N=45), H. K. (N=50) and Taiwan (N=42) on tests of PA, visual skills and reading ability. U.K. subjects were tested on an English version of the tests, while Hong Kong and Taiwan subjects were tested on a Chinese version: Hong Kong subjects were the only group to receive both the English and Chinese versions of the tests. Among the three groups, Taiwan subjects had been taught using ZYFH analytic phonetic transcriptions, while Hong Kong subjects had been taught with neither Pinyin nor ZYFH. However, in this study we have no record of whether the U.K. children had been taught with phonics or look and say method, however, it is suggested that the general curriculum in U.K. have taught children with phonics method. It was hypothesized that Hong Kong children would perform worse on Chinese phoneme deletion tests, i.e. a classic test of PA, than Taiwan children due to their lack of exposure to any system of phonetic transcription in their Chinese L1 instruction. Here they intend to look specifically at PA in Chinese as L1 as a result of their unique phonological scripts, ZYFH training, without taking L2 alphabetical literacy as PA into consideration as we see in Read et al.’s study (1986). There was, then, no expectation for the HKS of any PA transfer back into a Chinese task from having studied English in this study.

PA tests used words and non-words in rhyme and alliteration tasks, e.g. Odd Man Out tests. In such tasks, the students were presented with a group of words in spoken form, e.g. rot, rod, rock, box and they were asked to indicate which was the odd word out in terms of its first sound. In the Chinese version of the test, all words were presented with the same level tone, e.g. ‘ba’, ‘bo’, ‘fei’, ‘be’⁵, and students were asked to indicate which word was different in its first sound. Items with medial and final sound differences were also included in the test.

An additional type of task used is a Phoneme detection task, where students were required to figure out how to pronounce words that had lost a certain phoneme, for instance, ‘stop’ becomes ‘top’ when the first sound is removed. In this task, only real words were used in both Chinese and English versions of tests.

Two visual skills tests were also administered. These comprised a Visual Form Discrimination (VFD) test and a Visual Paired Associates (VPA) test in order to measure the visual counterpart of PA. In the VFD test, students were asked to match a target, involving a major and a peripheral figure, geometric shapes, with its copy from among three foils: in the foils one involves displacement or rotation of the peripheral figure, another involves rotation of the

⁵ The authors did not provide Chinese version examples of Odd Man Out. This is also true for the other types of task, therefore, the researcher is not able to give examples of Chinese characters used in these tasks.
major figure, and the third involves distortion of the major figure. In the VPA test, students were asked to associate a coloured shape with a differently coloured identical shape, selected from a set of six.

The study also included reading ability tests. These comprised the Schonell Reading Aloud Test, used in Britain and Hong Kong, and a Chinese version of Schonell, developed as a Character Recognition test for H. K. and Taiwan subjects. In the Character Recognition test, as in the Schonell test, subjects were asked to read 100 unrelated words aloud and only stopped if 10 consecutive words were failed. The format of the test had 10 characters or words per line on one page and the difficulty level was increased on consecutive pages. Since these were purely test of ability, and indeed ability to read aloud, not necessarily accessing meaning, these are not tests that throw direct light on the degree of involvement of phonology in the normal reading process, as many studies in chapter 3 did, that we aim to do.

Finally, a non-verbal IQ test and a vocabulary test were used. The former test is to assess mental development and intellectual maturity, while the latter is to test subjects’ ability to use the appropriate vocabulary to name a picture presented visually. Children in this test were asked to point out which picture corresponded to the word spoken by the experimenter, i.e. no reading involved.

All of the above tasks were divided into two sections and administered over two days, taking approximately 30 minutes on the first day and 20 minutes on the second day. Each subject was tested individually.

Performance on all phonological tests was highly correlated with English reading ability in the U.K. subjects, ranging from Odd Man Out (r=.37, p <.001) to Phoneme Deletion (r=.59, p<.001). VPA scores were highly correlated with Chinese reading scores in the Hong Kong subjects (r=.70, p<.001) and in the Taiwan subjects (r=.76, p<.001). Further analysis of predictors of reading ability was carried out using IQ scores, vocabulary scores, phonological test scores and visual test scores. Four factors were entered into a multiple regression analysis as predictor variables of reading ability and this again showed that performance on the phonological tests was a significant predictor of reading scores for English children (F=33.34, p<.0001). This was not the case for performance on the visual tests. This remains true even when IQ and vocabulary scores have been partialed out. By contrast, for both Hong Kong and Taiwan subjects, visual skill performance was the best predictor of Chinese reading ability (F=11.16, p=.0018) for Hong Kong subjects and (F=39.84, p<.0001) for Taiwan subjects. Phonological ability here was not found to be a significant predictor of reading scores for the Taiwan group, although a non-significant result was found with the Taiwan subjects, who performed significantly better than the Hong Kong subjects on all the sub-tests of the Chinese Odd Man Out test employing real words, and Taiwanese children had higher scores than the Hong Kong children on the Chinese reading test. When the authors further analysed this effect by excluding the scores of the reading test, the result remained the same; therefore, the difference between these two groups in Chinese Odd Man Out cannot be accounted for by the superior reading ability of the Taiwanese children. This
significant effect was also found in non-word Chinese Odd Man Out tests. Likewise, an analysis of covariance in Chinese reading test scores and Chinese Phoneme Deletion test showed a significant advantage for the Taiwan group over the Hong Kong group \( (F=296.28, p<.0001) \), while no significant difference was found between these two groups on visual skills tests.

Generally speaking, this study found a significant correlation between PA and reading ability in English, but not in Chinese subjects. However, this study also acknowledged a significant difference in the performance on Chinese versions of PA tests between Hong Kong and Taiwan groups. The authors note (p91-92) that: “the correlations between the phonological tests and reading results were descriptively somewhat stronger in Taiwanese subjects than in the Hong Kong subjects”. This provides some indication that learning ZYFH had an impact on PA and possibly on learning to do word reading, even though the test of reading was biased in the sense that it required access to phonology by its nature.

A potential weakness in Huang and Hanley’s study concerns the degree of familiarity of the words used in the tests, which appear to be odd ones to the subject as the Taiwanese children were not able to respond in the English version test and as a result had to be excluded from the test. The Schonell Reading English test was used in Britain and Hong Kong, but the Chinese version of the test had to be devised to mirror Schonell as closely as possible. This required reference to estimates of frequency of characters from 1967, and led the authors to acknowledge the possibility of there being some unfamiliar words in the tests.

A further potential complication concerns whether the subjects had learned sufficient words by the time they participated in the test. It might be difficult for such young subjects, aged 8-9, with limited L2 vocabularies to perform on the tests. This was again reflected in the Taiwanese group who had difficulties with the English Phoneme Deletion test, leading the authors to admit (p82) that “These subjects were completely unable to respond when asked what particular words would sound like if the first (or end) phoneme had been taken away”. This led to a decision that only the Chinese version of the test was administered to the subjects from Taiwan. This possibility of significant cross group differences might further explain why the phonological scores\(^6\) of the Taiwanese children was found significantly ‘losing’ their ability to predict reading scores when vocabulary scores were entered into the equation.

A different problem mentioned by the authors in connection with the English tests, where they observed that young English subjects might treat initial consonant clusters as single units, e.g. \([st]\) in \([stɑːr]\) star, is one unit and the child is unable to delete ‘s’ \([s]\) as an isolated phoneme (Stuart & Coltheart 1988). Possibly linked to this, the study also reported L1 phonological transfer when Hong Kong children tended to utter English loan words with initial consonantal clusters by introducing a vowel after the initial consonant. This may have played

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\(^6\) This was carried out by the multiple regression analysis using phonological scores as predictor variables of reading ability.
a part in the superiority of Hong Kong subjects over English subjects in Phoneme Deletion tests where words contained consonant clusters. The general suspicion, noted by the authors, is that the Phoneme Deletion task was treated as “a syllable deletion task” by Hong Kong subjects. This also might contribute to explaining why (p96) “the English children were significantly superior to the Hong Kong children only on the middle sound different part of the test” but not in the first and last sound tasks in the Odd Man Out tests. Again, this is a complication to PA tasks involving oral response.

The above observation causes us to be cautious about the selection of subjects and design of tests involving L1 and L2 has not always been as careful as it should have been and this casts doubt on the validity of many results, and studies by Scholfield and Chwo (2005) had intended to improve in there areas so that the actual phonological processing can be identified in relation to meaningful comprehension when doing the word reading, whether the use of phonological or visual graphic route, with greater or lesser use of segmental phonology and GPC rules in the reading process, and hence the suitability of phonics or whole word teaching as instructional effects are all in fact related to age/cognitive development as addressed and illustrated in PDP and DRC (Chwo 2007), which also had been taken into consideration in the experiment study (ibid). Children’s cognitive and linguistic competences are intimately connected. The role of cognitive development is considered as the basis of language acquisition in young learners (Piaget 1962, Bruner 1964). It is believed that word reading ability to be based on cognitive development and the formation of the related concepts as this has led most investigators to view language as reflecting cognitive processes (Chomsky 1959). For example, English as L1 children up to 12 years of age were generally considered to be able to use more complex word reading processes compared to a younger group, such as GPC rule if not earlier (March et. al, 1981), namely, the ability to use segmental phonology since they would intend to use a whole word approach if not otherwise instructed. This is recognized as a major issue barely touched on where many experiments results based on subjects with unidentified L1 or L2 word reading learning background (Chwo 2007). In the case of Chinese children at the initial primary stage, first grade of 7 years, without any segmental training in word reading would rely primarily on memorization or simple rote association which is a whole word approach if not otherwise instructed, therefore, Scholfield and Chwo’s (2005) study had investigated instructional effect when sufficient time of instruction was received until the sixth grade level, hence, subjects are at an age group level of development when they can be validly tested for effects of phonic as well as whole word instruction (Ho 1997, Lee et al. 1986, McBride-Chang et al. 1995). Test results based on this age group might have reflected more of cognitive maturity effect rather than instructional effect, not to mention in the case of L2 word reading. In order to see instructional effects clearly, children need to be of a maturity level of cognitive development that is sufficient to allow for valid testing of desired instructional effects (Bialystok et. al. 2003).
3. Conclusion

Overall, our review study differentiates two contrast teaching methodologies, ‘phonic’ versus and ‘whole word’, and attributes their availability and effectiveness based on learners’ developmental stage and relevant cognitive components. It is concluded that both are complementary by nature rather than exclusion of each other. The above discussion has indicated that different reading instructional methods interact differentially with the PA skills that subjects employ in word reading. Segmental awareness in learning an alphabetic writing system or a phonetic system such as Pinyin or ZYFH can increase PA and this may affect reading ability. The evidence of improved reading ability due to higher PA, other than improved reading aloud ability, has not been clearly shown above. And reading aloud ability without access to meaning ensured is not what we focused on. If increased PA that facilitates phonological processing in the word reading is a consequence for subjects who have learned Pinyin, a teaching methodology employing phonetic transcriptions such as ZYFH and its role in how meaningful comprehension of word reading can be achieved also deserves to be investigated. As we observed in Chwo (2007) where experimental tasks resort to speech production to elicit response from subjects with unidentified language learning background, also the typical PA tasks that are oral based production and often required to be correlated with other reading ability task. Scholfield and Chwo’s (2005) study excluded such task effect by coordinating the on-line task that directly access readers’ phonological/visual graphic processing with authentic local survey that takes subjects language instruction backgrounds into consideration, also conduct a word familiarity survey to construct valid and reliable tests targeted on suitable age group, which are comparable for us to contrast the whole word and phonic teaching, namely, instructional effect illustrated by PDP and DRC in deep orthography Chinese as L1 and shallow orthography English as L2. The other merit of Scholfield and Chwo’s (2005) task is to ask subjects to judge the meaning of the word, which also enable to test word reading processing, that is, on the way to achieve meaningful comprehension, whether phonological processing as a result of PA can be observed in Chinese as L1, or, alternatively, visual graphic processing as a result of WSE. The carefully designed experiment and comparable groups overcome the previous deficiencies and provide some valid results shedding light on the word reading with distinct instructional background.

Overall, this review study is of great interest to teachers and educators in both H.K. and Taiwan in that teaching Chinese word reading as well as English as second or foreign language has been a focal concern in both their primary school curricula. The ultimate goal is to justify a comprehensive and effective teaching methodology for both L1 and L2 word reading, taking account of the difference between Chinese and English in their GPC nature, which could benefit young readers from dichotomous L1 and L2 backgrounds to reach their potential and become confident readers at the right start!
Reference


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Review Studies on L1 and L2 Phonic versus Whole Word Teaching Methodology from English as L1 to English as L2


Review Studies on L1 and L2 Phonic versus Whole Word Teaching Methodology from English as L1 to English as L2


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Review Studies on L1 and L2 Phonic versus Whole Word Teaching Methodology from English as L1 to English as L2

緒論第一及第二語言自然發音及全字教學法從英語母語到英語外語

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摘要
教學法學者認為，在適切的教學引導下，語音認知有助於提升讀字能力。此論點同時適用於中文字彙閱讀以及英文外語學習。本文旨在進一步探究字形假設論學派中的字音字形相容論，並探討教學法對於不同語言的讀者在字彙閱讀上之影響。文中首先評論英語自然發音法和全字教學法之文獻，再以香港和台灣為例做相關研究的綜合討論；其間並檢視了第一及第二語言文字閱讀的異同處，針對在不同教學法情境下語音認知的效度做探討。

關鍵詞：字形假設論、文字體系先決論、字形字音對應性、自然發音法、全字教學法、字音認知