DOCUMENT RESUME

ED 462 012 FL 027 162

AUTHOR Hill, Monica
TITLE English Vocabulary Learning by Chinese Students: How Can Phonology Help?
PUB DATE 1999-08-00
NOTE 9p.; Paper presented at the Annual Meeting of the International Association of Applied Linguistics (Tokyo, Japan, August 1-6, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Chinese; College Students; Comparative Analysis; *English (Second Language); Foreign Countries; German; Graduate Students; Higher Education; *Language Processing; Native Speakers; *Phonology; *Second Language Learning; Vocabulary Development
IDENTIFIERS Hong Kong; *Phonological Processing; Phonological Skills

ABSTRACT

This study investigated whether or not Hong Kong Chinese adults would benefit from hearing, or phonologically processing, unfamiliar English words upon first encountering them. Participants, who represented different levels of English proficiency, included Chinese undergraduate students, postgraduate students, and adult native speakers of English. A series of empirical studies was conducted to ascertain whether or not certain variables would affect participants' learning performance. A contrastive study compared the effect of phonological processing by Chinese students and German students of a similar standard of English but whose first language was based on the Roman alphabet. Results of the studies highlighted the difficulty that Chinese students, particularly those less skilled in English, had in phonologically processing unfamiliar English words. The phonological dimension of word learning had a significant effect on Chinese second language learners, but not on those whose first language was written in alphabetic script. Even those who could decode the phonemic symbols were able to recall more words, although the difference was not statistically significant. (Contains 12 references.) (SM)

English vocabulary learning by Chinese students: how can phonology help?

Hill, Monica, University of Hong Kong, China
mmhill@hkucc.hku.hk

Paper presented at AILA '99 Tokyo,
1-6 August 1999,
Waseda University, Tokyo, Japan

Abstract

This paper focuses on whether or not Chinese tertiary students benefit from being able to hear an unfamiliar English word on first encounter, as well as see the form of the word. It is argued that Chinese learners who primarily employ visual strategies in processing Chinese characters, will tend to transfer this strategy to learning English words. English native speakers, however, tend to employ both visual and phonological strategies in lexical processing. Due to the different methods of lexical processing, it is possible that Chinese learners of unfamiliar English words will require additional phonological input to assist in processing these items.

During the process of the research, a series of empirical studies was conducted to ascertain whether or not certain variables affect the learning performance of the subjects. Having established that Chinese learners focus more on the visual than the phonological components of English words, further research showed that the greater the phonological input, i.e. hearing the pronunciation of an unfamiliar word, the more frequently the words were recalled. A contrastive study compared the effect of phonological processing by Chinese students and German students of a similar standard of English but whose first language is based on the Roman alphabet. The German subjects who heard the pronunciation of the words fared no better in the tests than those who did not hear them. It appears, therefore, that overt phonological processing is advantageous to learners whose L1 orthography is non alphabetic.

The results of these studies highlight the difficulty that Chinese students have, and particularly those less skilled in English, in phonologically processing unfamiliar English words. It is recommended that Chinese students be encouraged to listen to the pronunciation of unfamiliar words in order to assist and speed up the system of lexical processing and that teachers should be aware of this need and encourage their students to repeat unfamiliar words orally.

Introduction

In native language (L1) processing of English words, Aitchison (1987) refers to three dimensions of English lexical storage by native speakers: semantic, syntactic and phonological. Considerable research has been carried out on how native speakers process Chinese characters and Japanese kanji (see Koda, 1997; Leong, 1991; Mann, 1988; Tzeng and Hung, 1984; Tzeng, 1994). A contentious issue has been the extent to which Chinese and Japanese readers phonologically process, or 'sound out' the characters. This paper compares the storage and retrieval of English words by Chinese second language (L2) learners with that of English native speakers and a group of L2 learners whose first language is written in an alphabetic script. In selecting these groups of second language learners from two different orthographic systems, the intention is to identify whether or not phonological processing in a first language affects recall of L2 words, and to what extent Chinese learners exploit the phonological dimension in storing and retrieving English words.

Background

English has an alphabetic script and so individual letters, or combinations of letters, form written words which largely represent the phonemes of spoken words. Learners of English whose first language is not written in an alphabetic script may process written words differently from native English speakers. Hoosain (1991, 1992) notes that Chinese words presented visually to native speakers are recalled better and that the relationship between script, sound and meaning is very different in Chinese and English.

In Green and Meara's (1987) study of English learners from Spanish, Arabic and Chinese backgrounds, they found that "Chinese readers visually process English and Chinese words in the same way..... Chinese L2 learners may be unable to read aloud regular words whose meanings they do not know." (p112). A similar situation may apply to learners from other non alphabetic writing systems, such as Japanese. Koda (1997) notes that "there are strong connections between L1 orthographic systems and L2 processing procedures." (p.46)

Even within groups of learners from a similar orthographic system, there appear to be different methods of processing their written script. Hong Kong school children generally learn to read Chinese characters using the Whole Word Method, i.e. visual encoding, and are not taught to sound out the Cantonese words (Hsia et al, 1995). In China and Taiwan, however, the Mandarin speaking child learns by the Hanyu-Pinyin method as well as the Whole Word method. (Lam et al, 1991) 'The Hanyu Pinyin Method is like teaching decoding using the English alphabet' (p. 309)

English vocabulary teaching in Hong Kong schools does not normally include training in understanding phonemic symbols. Indeed, the majority of the subjects who took part in the empirical studies that follow reported that they had not been taught how to use the tables of phonemic symbols given in dictionaries and only a small number of them had taught themselves.

This paper investigates whether or not Hong Kong Chinese subjects benefit from hearing, or phonologically processing, unfamiliar English words on first encountering them. A subject is considered to have 'benefited' if he is able to recall more words. We first establish whether English native speakers retrieve English words by their written form or by sound and if the same method is used by Hong Kong Chinese L2 learners.

Subjects

A total of 76 subjects took part in the first experiment: one group of undergraduate (UG) Arts and Social Sciences students (n=27), one group of postgraduate (PG) Masters students (M.A. Applied Linguistics and M.Ed TESOL, n=29) and 20 adult native speakers (NS) of English.

These groups of subjects were carefully selected to represent different levels of proficiency in English. The undergraduate subjects were all from a similar educational background and had completed the Hong Kong Advanced Level Use of English examination with an average grade of C5/D6. This roughly equates to TOEFL 550.

The second group comprised Chinese postgraduate students enrolled on postgraduate courses at the University of Hong Kong. These students were asked to take part in the experiment in order to find out if proficiency in English might affect the processing of English words. The native English speakers were a group of educated professionals living in Hong Kong.

Procedure

All subjects were issued with blank slips of paper on which to record their answers. To ensure that they understood the procedure, a sample test using different target word forms was given. The letters 'ough' were written on the board and subjects were asked to give examples of English words that ended with those letters. Once several examples such as 'though', 'enough' and 'cough' had been elicited, the letters 'thr' were added at the beginning of the letters, creating 'through' and subjects were asked

if they knew the pronunciation of this word and then to give examples of English words which *rhymed* with it. Elicited responses included 'new', 'blue' and 'shoe' and subjects were reminded that variations in spelling could still result in rhyming words.

Subjects were then told that a different group of four letters would be presented in writing and they would have 30 seconds in which to write down as many English words as they could think of ending in those letters. This would be followed by the addition of one or two letters to form a separate word and subjects would again have 30 seconds in which to produce as many rhyming words as possible. Having checked that all subjects understood the requirements, the letters '*ight*' were written on the board and a stop watch was used to record the time. These letters were chosen as there are numerous English words with this ending such as: *night, sight, fight, might, right, light, height, weight* and *tight*, most, if not all, of which would be familiar to the subjects.

After 30 seconds had expired, the letter 'e' was added at the beginning of the letters to form the word '*eight*'. This target word was selected as its sound was distinct from the majority of those given above. Subjects confirmed that they were familiar with the pronunciation of this word and they were then given 30 seconds to write down as many rhyming words as possible.

Data Analysis

Each sheet was scored and the results were entered on a database according to their group and stimulus (visual or phonological). Each column pair was subjected to t-tests to measure the statistical variance between the modes. The data were treated as frequency rather than interval data.

Visual recall

The results of the visual coding exercise in which subjects were asked to write down words ending in '*-ight*', showed that the mean number of words produced was 4.59 for UG, 5.66 for PG and 6.55 for native speakers. The minimum number of words produced in 30 seconds was three for both UG and PG students and five for native speakers. The maximum was eight for UG, and nine for both PG and native speakers.

Phonological recall

In matching the sound of the target word, *eight*, the mean number of words produced was 1.04 for UG, 2.59 for PG and 7.30 for native speakers. The minimum number of words produced in 30 seconds was zero for both UG and PG students, and three for

native speakers. The maximum was five for UG, seven for PG and eleven for native speakers. Both groups of Chinese L1 subjects recalled significantly fewer words phonologically than visually: UG ($p<0.01$, $t=10.19$) and PG subjects ($p<0.01$ $t=5.67$). There was no significant difference in recall pattern for native speakers, although they tended to recall more words by sound.

In visual matching, native speakers were able to produce slightly more words than non native speakers and this is most likely due to the differences in proficiency levels. Native speakers were able to recall low frequency lexical items such *as 'freight', 'sleight', 'plight' and 'bight'* in addition to the higher frequency items such as *'light', 'night', 'fight', 'tight'* and *'sight'* which the less proficient undergraduates tended to produce. It would appear that native speakers of English are significantly better able to match the phonological dimension of words to their written form than Chinese L2 speakers.

While there is a significant difference in the visual and phonological recall pattern of Chinese undergraduate students, this tends to decrease as the English proficiency level increases.

Comparison of German and Chinese L2 lexical processing

As Chinese undergraduate students have a tendency to process English words visually rather than by sound, a further step in the research was to compare Chinese undergraduate students with learners of a similar proficiency whose L1 is written alphabetically. Ideally, Spanish subjects would have been selected, given the close script-to-sound relationship of the language, but there is no Spanish secondary school in Hong Kong. Instead, 39 subjects from the lower sixth form of the German Swiss International School were selected as being well matched in English proficiency. The German subjects were divided into control and experimental groups. 83 first year tertiary students were selected for the experiment and were divided into three groups: control, 'halfway', and experimental.

Procedure

Thirty low frequency words from the University Word List (Xue and Nation, 1984) were presented in isolation and all subjects were asked to give the meaning in English or Chinese of any words they thought they knew. The pre test sheets were collected and the target words were presented on a study sheet with phonemic transcription, L1 translation and an example of their use in context.

The Chinese and German Control groups took part in the experiment in class with no explicit access to the pronunciation of the words. The Chinese 'halfway' group consisted of a group of 28 students who had been pre-taught how to decode phonemic symbols. They also took the test in class. Both experimental groups were taken to a language laboratory and were able to listen to the pronunciation of the words recorded on tape as often as they wished.

In the test, subjects were asked to write the target words in English when given the L2 meaning and context, and were also asked to record on to a tape the pronunciation, or guessed pronunciation, of the words they could recall. Subjects were unexpectedly tested on their recall of the words one week later.

Test scores of immediate and delayed recall of the words were analyzed. Statistical analysis (MANOVA) showed that although the Chinese experimental group recalled more words in immediate written recall than the other groups, the difference was not significant. In immediate oral recall, however, the Chinese experimental group recalled significantly more words than the Chinese control group ($F=3.17$, $p<0.01$). The addition of sound produced no significant difference in recall by German learners of English, presumably because they were already adept at phonologically processing alphabetic script. In delayed written recall, both experimental groups who had heard the recorded pronunciation of the words achieved the highest scores a week after first presentation of the words. However, less than 23% of the words were remembered, and no significant differences were apparent, perhaps because of the small amount of data.

Implications

The study shows that the phonological dimension of word learning has a significant effect on Chinese L2 learners, but not on those whose L1 is written in alphabetic script. Even those who could decode the phonemic symbols, were able to recall more words, although the difference was not statistically significant.

As Cantonese speakers are more likely to encode English words visually, teachers should be aware that these learners may have greater difficulty in decoding the pronunciation of unfamiliar English words. Teachers should pay extra attention to the needs of these students. By focusing on the pronunciation of unfamiliar words, Chinese students may be able to process English words more efficiently, thereby increasing their English vocabulary. They may also gain more confidence in using newly learned words orally as well as in written contexts.

It is likely that other learners whose L1 is logographic i.e. written in characters, may also require additional phonological input and so Korean and Japanese learners of English may also benefit from assistance in pronunciation of unfamiliar words.

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