This paper reports the results of a study which investigated aspects of the English vocabulary knowledge of two groups of Chinese-speaking ESL teachers, one from Hong Kong, the other from Beijing. The study looks, in particular, at the extent to which teachers understand the lexical content of teaching materials. Five tests were constructed based on 30 vocabulary items from a text used to teach English in secondary schools (Form 6) in Hong Kong. For both groups, knowledge of formal aspects of vocabulary outweighed semantic knowledge. The Hong Kong teachers were able to explain the meaning of just under half of the words tested, which suggests that many teachers have a poor grasp of the meaning of the lexis which occurs in their reading texts. Interestingly, the Hong Kong teachers’ scores on a sentence production task were slightly higher than on tests of word meaning. This phenomenon suggests that the ability to produce convincing sentences in L2 may not be a reliable indicator of learners’ understanding of the language produced.

Introduction

In the heyday of the communicative approach to ESL teaching, teacher education courses for non-native speaker teachers attached high priority to developing teachers’ ability to use English confidently and fluently in the classroom. It was believed that teachers’ ability to engage in natural communication in the classroom called for a command of English which went far beyond an understanding of the language content of the course materials. The language component of courses on communicative methodology was often geared towards enabling teachers to conduct interactive activities in their classrooms (e.g. Willis, 1981). During the 1990s, the language content of teacher
education courses has been expanded with a view to heightening teachers' language awareness. Knowledge about language has become a central feature of teachers' courses, both in mother tongue and second language education. However, much of the recent interest in metalinguistic knowledge has tended to focus on grammar and syntax. While it is widely accepted that language teachers' knowledge and command of the target language is an important factor in influencing their teaching effectiveness, it is usually taken for granted that they have no difficulties in understanding and handling the vocabulary content of their teaching materials. The assumption that teachers have a reasonable understanding of the language content of their materials has never really been challenged. This paper reports the results of a study which examines different aspects of teachers' knowledge of the lexical content of a pedagogical text. In the light of the results, the wider issue of language development for teachers is discussed.

When assessing teachers' vocabulary knowledge, a number of questions immediately present themselves concerning the depth of knowledge which is considered adequate for effective teaching purposes. For example, do teachers need to know the meanings of all of the words in the texts they use? Do they need to know all the meanings of the words (i.e. in addition to the meaning in a particular context)? Do they need to know other forms of the words? Do they need to know how to pronounce the words? Perhaps before trying to answer these questions, it is worth bearing in mind that in most education systems, texts, both spoken and written, provide the main source of information about the language to be learned. Indeed, in some countries, there is only one purpose in reading texts in English: to learn new vocabulary.

**Literature Review**

Three related fields of research have particular relevance to the issues investigated in this paper:

(i) studies of English vocabulary learning by Chinese speakers,
(ii) psychological aspects of L2 vocabulary learning, and
(iii) the language knowledge and awareness of L2 teachers.
The issues explored in the present study build on the results of a previous investigation into aspects of Hong Kong learners' vocabulary knowledge (McNeill 1995). The most striking message to emerge was that the secondary school students investigated revealed an enormous gap between their semantic and formal knowledge of English words. While their ability to recognise and to produce orthographically correct versions of a set of target words was generally very good, their understanding of the words' meanings was surprisingly poor. Even subjects whose scores on tests of word meaning were low tended to score very high marks in tests of orthography, which suggested that their command of word forms was far superior to their knowledge of word meaning. The ability which the subjects demonstrated in producing correct written forms of words they did not understand invited a closer examination of the nature of their word knowledge. It was clear from the results that knowledge of word meaning was not the starting point for their learning of English words, as is often assumed. The Hong Kong subjects in the present study are older and, presumably, wiser, having undertaken tertiary level study as well as professional courses in teaching. The study sets out to uncover whether a similar gap exists among teachers between semantic and formal knowledge of words.

An interesting question which arose from the previous study was the extent to which L2 vocabulary knowledge was based on explicit and implicit knowledge. Ellis (1994) argues that word meaning relies on explicit language knowledge and calls for conscious processing, whereas knowledge of word forms operates at a less conscious level and relies on implicit language knowledge. Since the results of the previous study revealed such a large difference between the subjects' formal and semantic knowledge, the nature of the difference merited further investigation. The present study examines subjects' knowledge of pronunciation, morphology and the ability to produce acceptable sentences using the target words. One of the aims of the study is to identify any relationships which exist between knowledge of word meaning and other aspects of word knowledge, with a view to exploring further the view that L2 vocabulary knowledge involves both conscious and unconscious processes.

The wider issue of the role of consciousness in L2 learning has been a preoccupation of applied linguists during the 1980s and '90s.
Hulstijn and Schmidt, 1994). Attention has been drawn to the problems and ambiguities involved in producing definitions of consciousness. It is probably fair to say that the discussion of consciousness in second language acquisition has been focused on the learning of L2 grammar and the impact of explicit grammar teaching. For the purpose of the present study, which looks at vocabulary knowledge, it will be assumed, following Ellis 1994, that knowledge of meaning involves more conscious processing than knowledge of form. By looking at the correlation patterns between meaning and other aspects of word knowledge, such as morphology and phonology, we may be in a better position to assess word knowledge in terms of its use of conscious and unconscious processing.

The recent interest in language awareness has sought to establish relationships between an individual's knowledge about language and their proficiency in the language. Language awareness (LA) has been defined as "a person's sensitivity to and conscious awareness of the nature of language and its role in human life" (Donmall, 1985). LA has focused on making learners aware of their implicit knowledge of language and making that knowledge explicit. In second language acquisition research, theories have been developed concerning the relationship between implicit and explicit knowledge and their influence upon language performance (e.g. Sharwood-Smith, 1981). However, as Alderson et al. (1996) point out, "evidence for causal relationships between LA and enhanced language learning or language use is elusive". (p2) Not surprisingly, there has been considerable interest in integrating LA into the syllabus of teacher education courses (Borg, 1994; Francis, 1994; Hunston, 1995; Wright and Bolitho, 1993). While non-native speaker teachers of English have always been well provided for in terms of reference works about English, materials aimed at developing native speaker teachers' LA have been part of recent developments in teacher education in UK (e.g. Carter, 1990; Hawkins, 1984; Mittins, 1991). An encouraging aspect of the recent activity in LA is that researchers and practitioners from first and second language learning are working in close collaboration (James & Garrett, 1991).

An assumption underlying the movement to develop teachers' LA is that their language teaching performance will improve as a result. However, the extent to which teachers are able to understand and
anticipate their students' difficulties with particular items of language is a question which has hardly been addressed. Do teachers whose own language awareness is high show more sensitivity to their learners' problems than teachers with low language awareness? Does a teacher's proficiency in the target language have any bearing on their sensitivity to students' language learning? Although the pedagogical implications of teachers' language awareness are not investigated in the present study, there is a small but growing interest in the factors which contribute to teachers' ability to identify sources of difficulty for students in texts (Brutten, 1981; McNeill, 1994; Fung, 1995).

Research Questions and Hypotheses

The study attempts to provide answers to three general questions concerning the vocabulary knowledge of Hong Kong English teachers. In addition, two explicit operational hypotheses are tested.

Research Questions

1. Which aspects of word knowledge present most problems for Hong Kong English teachers?
2. How does knowledge of word meaning relate to other aspects of L2 word knowledge?
3. Are there differences between Hong Kong and Mainland Chinese teachers' English vocabulary knowledge profiles?

The first question is intended to provide an indication of how the various components of word knowledge are represented in the subjects (for example, knowledge of word meaning, pronunciation, morphology and the ability to use words productively). The second question is intended to explore the view that knowledge of meaning involves more conscious processes than other dimensions of word knowledge. The third question allows a comparison between two different types of Chinese learner: (a) students who have studied through the medium of English, and (b) students who have studied within a Chinese medium system.

Hypotheses

Two hypotheses, based on commonly held assumptions about second language learning, are tested:
1. It is easier to explain the meaning of L2 words using L1 rather than L2.
2. The ability to produce acceptable sentences presupposes an understanding of the meaning of the words used.

**Design of the Study**

The two groups of subjects, one in Hong Kong and the other in Beijing, were asked to read a text and to answer questions based on the lexical content.

**Subjects**

The subjects were all trainee teachers of English. The Hong Kong group consisted of 50 recent graduates from the Hong Kong Institute of Education. All had just completed a two- or three-year pre-service qualification in English teaching and had been awarded a Teacher’s Certificate. They were all about to begin a special two-year programme at the University of Hong Kong to convert their Teacher’s Certificate to a Bachelor of Education degree, majoring in English. The China group consisted of 15 students attending the third year of a Bachelor of Arts degree in English at Beijing Foreign Studies University. The subjects were between 19 and 24 years old. Unfortunately, the size of the Beijing group is rather small.

While the Beijing group had been educated through the medium of Chinese, the Hong Kong students had all been taught through the medium of English at schools and colleges in Hong Kong. Apart from the difference in medium of instruction, the groups also differed in terms of their spoken Chinese, with the Hong Kong subjects using Cantonese, while the Beijing group spoke Putonghua.

**Materials and Procedure**

Five word knowledge tests were constructed based on 30 words from a reading text used at Form 6 level in Hong Kong secondary schools (Appendix A). The words were identified by the author and two teachers familiar with the target level as the 30 words which were most likely to cause difficulty for Form 6 pupils. Parts of the actual tests are reproduced in Appendix B. The dimensions tested are knowledge of meaning, phonology, morphology and sentence.
production. The tests were administered to both groups in a single session lasting for 45 minutes. Subjects had access to the reading text from which the words were taken, but were not allowed to use any reference materials during the tests.

Most attempts to describe the dimensions of L2 word knowledge (e.g. Nation, 1990; Carter, 1987) identify these elements as constituent parts of "knowing a word". Knowledge of orthography was excluded from the test battery, since the evidence from McNeeill (1995) allows us to assume a very high level of orthographic knowledge for Chinese subjects.

Word Meaning
In the vocabulary testing literature, no single approach to testing knowledge of meaning has emerged as being more effective than others. The tests used in the present study asked the subjects to give an explanation of the meaning of words using (a) Chinese, "Ex(Chin)", and (b) English, "Ex(Eng)", as used in the text. The scoring of the tests ignored errors in grammar and spelling. In addition to the separate scores given for English and Chinese explanations, a composite score for word meaning was calculated, based on the total number of words which a subject was able to explain correctly using either English or Chinese. In calculating the composite meaning score, "Ex(all)", each of the words correctly explained in either language was counted once only.

Phonology
Subjects were simply asked to mark the stress pattern of each of the words. Unfortunately, the subjects' command of phonemic symbols was not sufficient to request a full transcription of the words.

Morphology
A test was constructed which asked subjects to produce one other specified form of the target word, for example:

\[
\begin{array}{ccc}
\text{Noun} & \rightarrow & \text{Verb} & \text{Verb} & \rightarrow & \text{Noun} \\
\text{constraint} & \ldots & \text{subsidize} & \ldots & \text{re-align} & \ldots
\end{array}
\]
This test consisted of 25 items since five of the original 30 target words did not allow themselves to be tested in this way because they did not have other common forms: "clog", "milestone", "token fee", "manpower", "flat" (rate).

**Sentence Production**

Subjects were asked to produce a sentence using the target word in a semantically acceptable way. This test was intended to measure the extent to which the learners could use the words productively. When judging the acceptability of the sentences, two native speakers of English were asked to judge whether the sentences produced were acceptable and meaningful English sentences. The judges were asked to focus more on the semantic acceptability of the sentences and to ignore minor irregularities in syntax and spelling.

**Data Analysis**

The analysis of the data was conducted as follows. Using the mean scores on the various tests (Table 1), the overall vocabulary knowledge profiles of the groups were plotted (Figure 1) and the scores were subjected to an analysis of variance (MANOVA). The correlations between the word meaning scores and the other measures were also calculated (Table 2). In addition, some qualitative analysis was carried out with the morphology and sentence production data. In the case of the morphology data, the errors were grouped into those whose forms were typical of the grammatical class required by the test and those whose forms were either typical of another grammatical class or totally unacceptable. The purpose behind this was to look for evidence that subjects had acquired rules of morphology, even when they wrongly applied the rules. The main purpose behind the qualitative analysis of the sentence production test was to identify instances of sentences which were considered by the judges to be acceptable, but where evidence from the word meaning test demonstrated that the subject did not know the meaning of the words used.
Results and Discussion

Results of individual tests

The mean scores and standard deviations for both groups are shown in Table 1. The performance of the two groups is illustrated by means of a bar chart (Figure 1).

Table 1: Mean scores for Hong Kong and Beijing Teachers Groups on tests of vocabulary knowledge of 30 lexical items from pedagogical text "Existing Problems"

<table>
<thead>
<tr>
<th></th>
<th>Word Score (max = 30)</th>
<th>Morph. Stress (max = 25)</th>
<th>Produce Sentence (Eng+Ch) (max = 30)</th>
<th>Explain (Chinese) (max = 32)</th>
<th>Explain (English) (max = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>HK Teachers (n=30)</td>
<td>20.90</td>
<td>14.58</td>
<td>14.92</td>
<td>14.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.85)</td>
<td>(3.14)</td>
<td>(9.64)</td>
<td>(4.32)</td>
</tr>
<tr>
<td>Beijing</td>
<td>Beijing Teachers (n=15)</td>
<td>26.27</td>
<td>20.13</td>
<td>19.00</td>
<td>15.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.39)</td>
<td>(2.39)</td>
<td>(3.07)</td>
<td>(8.00)</td>
</tr>
</tbody>
</table>

47
Both groups performed better on the tests of formal knowledge (word stress and morphology) than on the tests of word meaning. The Hong Kong subjects were able to give the meaning of just under half of the words and, interestingly, were able to produce slightly more correct sentences using the words than correct explanations of their meaning. The results suggest that it cannot be safely assumed that teachers fully understand the lexical content of teaching materials. While the teachers in the study may know the pronunciation, forms and spelling of words, they are very likely to have less idea of what the words actually mean. What is more, this ignorance of word meaning did not prevent them from producing sentences which look perfectly plausible. In answer to the first research question, the emerging profile of Hong Kong teachers' vocabulary knowledge is one in which a grasp of the formal aspects outweighs that of meaning and where correct sentences can be produced without an understanding of the meaning of the words used. The results allow us to reject the second hypothesis: "The ability to produce acceptable sentences presupposes an understanding of the meaning of the words used."
The Beijing subjects performed better than the Hong Kong group on all tests, except sentence production and giving explanations in Chinese, where both groups' scores were similar. The data were subjected to an analysis of variance (MANOVA) using a between-groups design, with Group as the independent variable and the results of the six tests as multiple dependent variables. The overall multivariate test showed a highly significant main effect for group: $F(1,63)=11.71, p=.000$. According to the univariate F-tests, the following individual knowledge types contributed to the significant overall effect:

<table>
<thead>
<tr>
<th>Knowledge Type</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explaining meaning (combined E+C)</td>
<td>12.63</td>
<td>.001</td>
</tr>
<tr>
<td>Explaining meaning in L2 (English)</td>
<td>10.47</td>
<td>.002</td>
</tr>
<tr>
<td>Morphology</td>
<td>39.90</td>
<td>.000</td>
</tr>
<tr>
<td>Word Stress</td>
<td>27.28</td>
<td>.000</td>
</tr>
</tbody>
</table>

No significant effects were found for explaining meaning in Chinese (L1) or for sentence production.

In terms of their knowledge of the formal aspects, word stress and morphology, the Beijing students demonstrated a very high level of accuracy and their overall understanding of word meaning was considerably higher than the Hong Kong group. While both groups gained similar scores in their ability to explain meaning in Chinese, the Beijing group significantly outperformed the Hong Kong group in their ability to explain meaning using English. At first sight, this appears to be an unexpected result, since the Hong Kong group were taught through the medium of English and the Beijing group through the medium of Chinese, making a reverse picture more likely. However, when the realities of language teaching in Hong Kong and Beijing are considered in more detail, the result is less surprising. When interviewed about the results, the teaching staff involved in Beijing explained that their classes were always conducted in English and that teachers used English to give explanations of new vocabulary. By contrast, in the so-called English medium environment of Hong Kong, teachers frequently use Chinese (Cantonese) to explain the meaning of new vocabulary. As far as the first hypothesis is concerned ("It is easier to explain the meaning of L2 words using L1 rather than L2.")
results from the Hong Kong group support the hypothesis, while the Beijing results do not. The difference between the groups' abilities to explain words using L1 and L2 appears to be explained by the different type of teaching experienced by the two groups. The effect of instruction upon learners' vocabulary knowledge profiles may well have been underestimated.

**Relationship between meaning and other aspects of word knowledge**

For each group the correlation between the composite meaning score and the scores on the other tests was calculated (Table 2).

<table>
<thead>
<tr>
<th></th>
<th>Hong Kong Group (n=50)</th>
<th>Beijing Group (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentence Production</td>
<td>$.6677 (p = .000)</td>
<td>$.8249 (p = .000)</td>
</tr>
<tr>
<td>Morphology</td>
<td>$.3183 (p = .024)</td>
<td>$.6336 (p = .011)</td>
</tr>
<tr>
<td>Word Stress/Phonology</td>
<td>$.2535 (p = .076)</td>
<td>$.4385 (p = .102)</td>
</tr>
</tbody>
</table>

The results show significant correlations in both groups with sentence production. This is not really surprising since producing sentences is essentially about communicating meaning. However, the correlation is higher for the Beijing than for the Hong Kong group, where the data contain many instances of correct sentence production with words whose meanings were unknown. This phenomenon is discussed in more detail below.

More interesting are the relationships with morphology and phonology. The significant correlation coefficients obtained suggest a strong relationship, for both groups, between knowledge of word meaning and morphological knowledge. Once again, the influence of instruction is probably important in explaining the difference between the groups. The Beijing students, having studied English as a foreign language at school and university in China, were more familiar with
the morphological system of English than their Hong Kong counterparts, who had studied at English-medium schools and colleges, where less attention appears to be paid to the formal study of English as a system. This difference in background knowledge is reflected in the students' performance, with the Hong Kong group less able to produce different forms of the test items. As mentioned in the introduction to this paper, it has been argued (Ellis 1994) that knowledge of the meaning of L2 vocabulary operates at a more conscious level than knowledge of word form. The extent to which L2 morphological knowledge is explicit or implicit has not really been addressed. It is generally assumed that native speakers apply the system of morphology in an unconscious manner, since they have internalised the various patterns involved. However, for L2 learners the acquisition and application of morphological knowledge may well operate at a more conscious level. In the light of the significant correlation between the morphology and meaning scores in the present study, the extent to which morphological knowledge in L2 operates at a conscious level merits further investigation.

As far as phonology is concerned, there was no significant correlation with word meaning in either group. An obvious explanation for this is to assume that phonological knowledge operates like orthographic knowledge and is processed in a largely unconscious manner or at least in a far less conscious way than meaning. However, it has to be remembered that the test used to measure phonological knowledge only involved the identification of the stress patterns of the test items. Getting the subjects to produce the words orally would have tested phonological knowledge more thoroughly and might have produced different results.

**Insights from qualitative analysis**

Since the purpose of this paper is to examine the relationship between the different components of L2 vocabulary knowledge, discussion of the types of explanations and actual sentences produced is deliberately kept brief. However, an informal analysis of the tests of meaning reveals that the errors fall into three broad categories:

(i) errors which show complete ignorance of the word's meaning,

(ii) errors which indicate an awareness of the field of meaning to
Vocabulary knowledge profiles: evidence from Chinese-speaking ESL teachers

which the word belongs, i.e. semantically-related, and
(iii) confusion of the target word with another word whose form is similar (synform), but whose meaning is quite different.

Examples of semantically-related errors are: "The recruitment will be ready on your desk. Please sign it as soon as possible." (Explanation: "recruitment" understood as "employment contract") "A condom is a safety net against AIDS." (Explanation: "safety net" understood as "protection") Errors of this type suggest that learners often associate words with particular contexts and situations, but may have only a vague idea about a word's meaning. Examples of synforms errors are: "The police sent the criminal to a retention (confusion: detention) centre." "There was a clog (confusion: clock) hanging over the window." Confusion of part of a compound word or unit was also common: "Anita Mui used her job in television as a milestone (confusion: stepping stone) to a career in local politics." "The floods reached manning levels." (confusion: record levels)

For a full discussion of synforms, see Laufer (1991).

Morphology Test

The scores which were used for the analyses in the preceding sections (based on Table 1) were awarded for a fully correct response. The scoring system did not distinguish between the following types of error:

(i) words whose forms are typical of the word class requested, and

(ii) those whose forms look like another word class or are totally unacceptable.

However, since many of the errors produced were of the former type, an alternative scoring system was introduced which awarded a score for any response whose form was typical of the target word class. The reasoning behind this alternative scoring procedure was that subjects who produced a word form typical of the target class demonstrated a better command of the English morphological system than subjects who produced totally unacceptable forms. Examples of the two types of error are shown in Table 3.
Table 3: Analysis of the responses to Item 13 of the morphology test

Item 13: SURGERY (n.) -> Target: "SURGICAL" (adj.)
Results: 41% correct 59% incorrect

Incorrect yet formally possible words and their frequency:

<table>
<thead>
<tr>
<th>Adjectives (33%)</th>
<th>Nouns (15%)</th>
<th>Adverbs (20%)</th>
<th>Verbs (10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>surgerious (4)</td>
<td>surgeric</td>
<td>surgerly (3)</td>
<td>surge</td>
</tr>
<tr>
<td>surgerive (3)</td>
<td>surgerous</td>
<td>surgery</td>
<td>surgerize</td>
</tr>
<tr>
<td>surgerical (2)</td>
<td>surgerative</td>
<td>surgerily (3)</td>
<td></td>
</tr>
<tr>
<td>surgerable (2)</td>
<td>surging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgeral</td>
<td>surgetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgering</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is possible to argue that the subjects who produced one of the errors in column one ("adjectives") display a greater understanding of the morphological system than those who produced other types of error. The results of the alternative (lenient) scoring method are shown in Table 4.

Table 4: Mean scores on Morphology Test using "strict" and "lenient" scoring methods and results of paired-t-test

<table>
<thead>
<tr>
<th></th>
<th>Hong Kong Gp (n = 50)</th>
<th>Beijing Gp (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean S.D.</td>
<td>Mean S.D.</td>
</tr>
<tr>
<td>Strict Scoring (max. = 25)</td>
<td>14.58 (3.14)</td>
<td>20.13 (2.39)</td>
</tr>
<tr>
<td>Lenient Scoring (max. = 25)</td>
<td>17.62 (3.08)</td>
<td>22.07 (1.16)</td>
</tr>
<tr>
<td>t-value = 13.20 (p &lt; .001)</td>
<td>t-value = 4.49 (p &lt; .001)</td>
<td></td>
</tr>
</tbody>
</table>

In both groups, subjects scored significantly better when judged by the more lenient system. Paired t-tests which compared each group's performance according to the two methods of scoring produced the highly significant t-values shown in Table 4, with a particularly large increase in the scores of the Hong Kong group. However, while the modified scoring system may show that the subjects have a generally good grasp of English morphology, the extent to which they are able to apply the knowledge of word formation to produce particular...
words is less clear. The correlations between the "lenient" morphology test scores and the scores on the composite "Explain Meaning" test were calculated and are shown in Table 5.

<table>
<thead>
<tr>
<th></th>
<th>Hong Kong Gp (n = 50)</th>
<th>Beijing Gp (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Lenient&quot; scoring method</td>
<td>.2064 (p = .150)</td>
<td>.4201 (p = .119)</td>
</tr>
<tr>
<td>&quot;Strict&quot; scoring method</td>
<td>.3183 (p = .024)</td>
<td>.6336 (p = .011)</td>
</tr>
</tbody>
</table>

There are no significant correlations between the test of word meaning and the test of morphology, using the "lenient" scoring. This approach to scoring awarded points to candidates who appeared to have grasped morphological rules relating to the word classes being tested, but who did not always produce the correct target form. It can be argued that their grasp of morphological knowledge is more theoretical than applied. Interestingly, significant correlations with word meaning were obtained when under the "strict" scoring system, which required subjects to produce specific word forms. These results add further support to the view that, for second language users, the application of morphological rules to produce particular word forms may involve a more conscious level of processing than for native speakers.

**Sentence Production Test**

One of the most revealing insights produced by the study was students' ability to produce plausible sentences using words which they did not really understand. Table 3 provides an illustration of this phenomenon with reference to sentences produced using the word "demographic". All of the sentences listed were produced by subjects who were unable to give the meaning of "demographic" either in L1 or L2. The subjects' explanation of the meaning, taken from their responses to the meaning tests, are given in the "explanation" column. The sentences were judged to be perfectly acceptable and meaningful by two native speaker teachers of English.
Table 6: Sentences produced by subjects who gave incorrect explanations of the meaning of "demographic"

<table>
<thead>
<tr>
<th>No.</th>
<th>Sentence:</th>
<th>Explanation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>As a result of demographic changes, many women now have to go out to work.</td>
<td>social</td>
</tr>
<tr>
<td>2.</td>
<td>Chinese immigrants are producing demographic problems in Hong Kong, especially in education</td>
<td>great</td>
</tr>
<tr>
<td>3.</td>
<td>There is a demographic difference between Hong Kong and Kowloon</td>
<td>relief/ contour</td>
</tr>
<tr>
<td>4.</td>
<td>Demographic factors have been influenced by improvements in medicine.</td>
<td>the life of the people</td>
</tr>
<tr>
<td>5.</td>
<td>I have learned the demographic concept from geography.</td>
<td>(human geography?)</td>
</tr>
<tr>
<td>6a.</td>
<td>Following demographic changes, the Governor has been criticised</td>
<td>democratic</td>
</tr>
<tr>
<td>6b.</td>
<td>Demographic changes, economic changes and political changes will be seen before 1997.</td>
<td>democratic</td>
</tr>
</tbody>
</table>

Students in Hong Kong are exposed to vast amounts of textual material in English, not only in their English courses but for their study of other school and university subjects as well. This means that they have the ability to recognise many words, whose meanings they have not really absorbed. As the data from the sentence production test show, the students also appear to have developed the ability to produce sentences which are formally and semantically correct, without having grasped the meaning of the key lexis involved. Words appear to be remembered along with their immediate contexts, which can give the impression of good collocational awareness on the students’ part. With repeated exposure to words in texts, students presumably make some assumptions about what the words mean and may even be able to use the words productively without their ignorance of meaning ever becoming apparent. The subjects’ explanations of the word “paradoxically” illustrate this point. Table 4 lists some of the incorrect explanations given.
Table 7: Examples of incorrect explanations of the test item "paradoxically"

<table>
<thead>
<tr>
<th>Actually</th>
<th>As a whole</th>
<th>At the same time</th>
</tr>
</thead>
<tbody>
<tr>
<td>However</td>
<td>Normally</td>
<td>To see things perfect</td>
</tr>
<tr>
<td>Optimistically</td>
<td>In theory</td>
<td>Theoretically</td>
</tr>
<tr>
<td>Generally speaking</td>
<td>In reality</td>
<td>Unfortunately</td>
</tr>
<tr>
<td>Ridiculously</td>
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</tbody>
</table>

While these explanations do not account for the meaning of "paradoxically", they could often be substituted for it in a sentence, leaving it perfectly correct and intelligible.

Conclusion

The relatively poor performance of the subjects on the tests of word meaning suggest that it cannot be assumed that teachers of English have a sound grasp of the vocabulary content of pedagogical texts. There appears to be justification for including vocabulary improvement in language enhancement courses for teachers. It would be unfortunate if the current efforts to develop teachers' language awareness failed to address such an obvious need.

While the results of the study appear to confirm the view that knowledge of meaning operates at a more conscious level than formal aspects of word knowledge, it was interesting to note that a strong relationship existed between the subjects' knowledge of word meaning and their ability to operate morphological rules correctly. The extent to which morphological knowledge in L2 relies on conscious processing merits further investigation.

In her discussion of vocabulary acquisition in L1 children, Bialystok (1991) argues that children typically move from a semantically-based knowledge of language to a more formally structured understanding.
"Language learners constantly reorganize their knowledge of the linguistic system to increasingly explicate its formal structure. The result of this process of analysis is that new analyzed symbolic representations emerge out of the non-analyzed or semantic ones". (p,118)

The data from the present study with L2 learners suggest that the process is more likely to operate in the reverse direction, with learners moving from formal to semantic knowledge of L2 words, as their proficiency improves. Classroom activities which focus on meaning rather than form would obviously be of use, particularly with higher proficiency levels.

The L2 vocabulary profiles of the learners in the study also prompt a re-evaluation of our notions of receptive and productive vocabulary. Nation (1982) distinguishes between receptive and productive learning as follows:

"Productive learning involves being able to produce the foreign word by speaking or writing. Receptive learning involves being able to recall the translation of the foreign word when the foreign word has been seen or heard." (p,19)

In the present study, both the Hong Kong and the Beijing subjects were able to produce L2 words in written sentences without being able to recall the L1 translation when seeing the word. At least as far as Chinese-speaking learners are concerned, dichotomising vocabulary knowledge as receptive or productive may not be helpful in accounting for the profiles of vocabulary knowledge uncovered by the study.

Note
I am grateful to Paul Meara for his comments on an earlier version of this article.
References:


James, C. & Garrett, P. (Eds.). *Language Awareness in the Classroom*. London: Longman


Appendix A: Reading text used in the study

Existing Problems

Overloading

2.10 Demographic changes, rising costs, new medical challenges and enhanced consumer expectations have all brought new pressures on the healthcare system. Until recently, hospitals were often lined with camp beds. Long queues still clog the clinics. That is a constant source of dissatisfaction to, and a point of complaint from, the public. Some of these problems are capable of solution by better management and are being put right by the Hospital Authority. The Department of Health is also taking steps to make it more convenient and pleasant to visit its clinics, such as by shortening waiting times and improving the environment in waiting areas. Paradoxically, these improvements may exacerbate old problems by causing a new influx of patients from the private sector.

2.11 A less apparent symptom of overloading is the appalling waiting time at specialist out-patient clinics. This is the number of days that a person has to wait for first attendance upon referral. It may be the result of inadequate manpower and resources, but other possible causes include unnecessary referrals, lack of screening for urgent cases, poor organization of clinic time, low throughput of cases and one-way referral from the private sector. The same reasons may explain the long waiting time for hospital admission or surgery.

Manpower Constraints

2.12 The problem of overloading has dampened the morale of healthcare staff, who have to work long hours in a stressful environment. It has added to the problems of staff
recruitment and retention. In response, a range of improvements has already been made to the pay and service conditions of doctors, nurses and supplementary medical professionals. Significant milestones have also been set in establishing the Hospital Authority and Hong Kong Academy of Medicine - for better management of hospitals and enhanced postgraduate training of doctors. Despite these efforts, it remains difficult to recruit and retain nurses. Detraction from tasks that nurses are trained for and engagement in non-professional and menial work have made nursing work relatively frustrating and unattractive. The manning ratios in hospitals are outdated and unsuitable for present-day application. Clearly, there is a need to re-orient and re-align duties, and to improve career prospects and training opportunities. Measures such as the introduction of Ward Stewards and Clinic Assistants to take up non-professional duties, and the development of a professional stream of Nurse Specialists, are only the first steps forward. More needs to be done as rapid advancement in medical technology requires greater professional skills and specialization. The Hospital Authority is currently finalising its manpower review. A comprehensive strategy and plan of action will be formulated upon completion of that review.

Inequitable Fee Structure

2.13 All public health services are heavily subsidized by Government. The level of subsidy reaches 80% or more of the costs in most cases. The rest is covered by an all-inclusive fee at a flat rate. The rationale is that the public sector acts as a safety net for those who are less fortunate and that no one would be denied adequate treatment through lack of means. In practice, even those who can afford to pay more than the token fee use the highly subsidized services, particularly hospital services. Moreover, the fact that public health services are cheap to the patient may not be conducive to public awareness of the high cost of maintaining community health.

(from Towards Better Health, consultation document, Hong Kong Government, 1993)
Appendix B: Parts of the tests used in the study

<table>
<thead>
<tr>
<th>NAME</th>
<th>AMCN99a</th>
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Test 1

Here are 30 words from the passage. First underline the stressed syllable(s) in each word (e.g. photograph, economical). Then give the Chinese equivalent of each word, as used in the passage, followed by an explanation in English of the word’s meaning, each word.

<table>
<thead>
<tr>
<th>(a) STRESS</th>
<th>(b) CHINESE</th>
<th>(c) ENGLISH EXPLANATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. demographic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. constraints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. clog</td>
<td></td>
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<tr>
<td>4. paradoxically</td>
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<tr>
<td>5. exacerbate</td>
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<td></td>
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<td>6. influx</td>
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<td></td>
</tr>
<tr>
<td>7. appalling</td>
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<tr>
<td>8. referral</td>
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<td>9. screening</td>
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<td>10. throughput</td>
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<td>11. surgery</td>
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<tr>
<td>12. dampen</td>
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<tr>
<td>13. recruitment</td>
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<tr>
<td>14. retention</td>
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</tbody>
</table>

62
15. milestone ____________________________

etc.

NAME: __________________________________________

Test 2

Make up an English sentence of your own using each of the words. Your sentence should illustrate a typical use of the word and should show that you understand the word's meaning.

1. demographic ____________________________

2. constraints ____________________________

3. clog ____________________________

4. paradoxically ____________________________

5. exacerbate ____________________________

6. influx ____________________________

7. appalling ____________________________

8. referral ____________________________

etc.