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AN ABSTRACT OF THE THESIS OF Kristi Allyn DuBois for the
Master of Arts in TESOL presented October 2, 1991.

Title: The Importance of Phonological Practice and Other
Strategies for Vocabulary Recall and Comprehension.

APPROVED BY THE MEMBERS OF THE THESIS COMMITTEE:

Kimberley Brown, Chair

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Joan McMahon

This study looks at English as a Second Language (ESL) students' use of vocabulary learning strategies and whether use of specific strategies is related to success in vocabulary recall and comprehension tests. The primary part of the study focuses on the hypothesis that phonological practice with new words will aid long-term recall and comprehension of these words. An empirical experiment with an experimental and control group was designed to test this hypothesis. The secondary section of the study discusses how often subjects reported using the vocabulary learning strategies categorized by Rebecca Oxford in Language Learning Strategies: What Every Teacher Should Know. In

addition, it researches possible correlations between use of these strategies, and scores on subsequent vocabulary recall and comprehension tests. Finally, this study describes how a representative group of students actually apply specific strategies to their vocabulary learning.

Thirty-seven ESL students studying in two higher education institutions in the Portland area participated in the primary part of the study. Half were taught vocabulary words through silent reading/writing exercises, while the other half were taught the same words through reading/writing exercises and the independent variable, pronunciation practice. In order to determine the effectiveness of phonological instruction in recognizing and remembering new vocabulary words, two post-tests were given immediately after the vocabulary lesson: a vocabulary comprehension test and a vocabulary recall test. To test subjects' long-term memory of the words, modified versions of the same tests were given two weeks later. No significant differences were found between the test scores of the experimental group and the control group although the group who received phonological instruction did tend to have higher scores than the group that did not.

In addition, a language learning strategy questionnaire designed by Rebecca Oxford was administered to determine whether there was any correlation between various vocabulary-learning strategies and scores on the vocabulary post-tests. Positive correlations were found between scores on the recall test and use of the following strategies: mental process strategies, practicing the sounds of English, using words in different ways, reading for pleasure, and guessing meaning from context. Positive correlations were also found between scores on the comprehension test and the strategies of practicing the sounds of English and using words in different ways. In other words, the more often the students said they used these vocabulary learning strategies, the higher their test scores were. The positive correlation between

practicing the sounds of English and test scores appears to support the main hypothesis that phonological practice will aid word recall and comprehension.

From the results of the learning strategy questionnaire given to the 48 subjects participating in the main study and the pilot study, it was determined that vocabulary-related mental process strategies are more commonly used by the subjects than remembering strategies. For example, the least commonly used vocabulary learning strategies are the remembering strategies of using flashcards, acting out words, using rhymes, and remembering the original location of words. The most commonly used vocabulary strategies are the mental process strategies of saying or writing new words several times and looking for cognates in one's native language. The study describes these strategies and others in more detail.

THE IMPORTANCE OF PHONOLOGICAL PRACTICE AND OTHER STRATEGIES
FOR VOCABULARY RECALL AND COMPREHENSION

by
KRISTI ALLYN DUBOIS

A thesis submitted in partial fulfillment of the
requirements for the degree of

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in
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DEDICATION

I would like to dedicate this thesis to my parents, Dorothy and Charles Wierer, my husband, Dennis DuBois, and my thesis advisor, Dr. Kimberley Brown, for helping me to believe in myself.

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CHAPTER I

INTRODUCTION

Vocabulary acquisition has until recently been a relatively neglected area of research in the study of second language acquisition. It is even more ignored in ESL programs. Courses on reading, writing, listening, speaking, and grammar are in abundance while vocabulary classes are a rarity. This is because there are still many teachers who believe that vocabulary learning will take care of itself in the course of doing something else, such as reading, as if by process of osmosis. This neglect of vocabulary research and teaching is even more striking considering the fact that language learners often say they have great difficulty with vocabulary, and that after the initial stages of acquiring a second language, the acquisition of vocabulary is their greatest problem and need (Meara, 1980). In fact, research has shown the importance of vocabulary knowledge in reading (Klare, 1974-75) and in academic achievement (Saville-Troike, 1984). These are all very good reasons why vocabulary development should no longer be neglected.

Fortunately, in the last decade there has been an increase in research in explicit vocabulary teaching methods. Although it is true that a large bulk of vocabulary learning is indirect, explicit learning of words can speed up future word comprehension and recall (Nation, 1980), which are prerequisites to written and spoken production. Direct vocabulary teaching can focus on frequent words that will be particularly useful to the language learner. It can help learners with words that cause difficulty or that will be necessary for another activity such as reading or talking. Furthermore, teaching words that contain features with a regular pattern, such as words with affixes, can aid learners in acquiring similar words more easily. Direct study of

words is especially useful to non-native speakers who will have to communicate and compete with native speakers in schools and the job market. Non-native speakers in universities, for example, have an obvious vocabulary handicap when compared to native-speaking undergraduates whom Nagy and Anderson (1984) estimate could know anywhere from 25,000 to 50,000 words. For these second language learners, explicit vocabulary practice is a necessity.

The question of why to teach vocabulary is much more easily answered than how to teach it, however. Traditionally, vocabulary has been taught in the course of reading, especially in second language textbooks. In addition, the current focus of vocabulary teaching has been on meaning, specifically guessing a word's meaning from context. It is true that guessing from context is an important skill for language learners to have to deal with the approximately 123,000 English words that make up only 2% of any text (Nation, 1990). However, it is not suitable for helping second language learners to establish a basic vocabulary level. Approximately 2000 highly frequent words make up 87% of the running words in texts (Nation, 1990). Because these words occur so frequently, a language teacher should spend time ensuring that they are learned. Furthermore, explicit vocabulary learning of the 800 to 1000 most common academic words found in textbooks should be another goal of non-native secondary and university students (Nation, 1990).

While guessing words from context is an excellent way to introduce words and their meanings, it does not help language learners to recall and use a new word or comprehend the word out of context. To fully acquire vocabulary, more specific attention must be given to new words outside of reading and listening texts. In this case, specific attention to words does not mean using totally decontextualized techniques such as word pair lists, flashcards, and conventional dictionaries which rely on rote memorization only. Extensive research in language learning has shown that rote memorization does nothing to

develop one's communicative competence in a language. Rather, what is necessary for vocabulary acquisition is what Oxford (1990) calls "semi-contextualized techniques."

Semi-contextualized techniques are those in which the context comes from associations with words or word-sounds, or from extra-linguistic relationships. Oxford (1991) gives an overview of these techniques including word grouping, word or concept association, visual imagery, aural imagery, keyword, physical response, and semantic mapping. All of these techniques are based on the idea that remembering is an associative task in which the language learners must form mental links between unfamiliar words and their definitions, new words and related words, and new words and basic world knowledge, such as images. Although the effectiveness of several of these techniques, such as the mnemonic device, or keyword method, has been shown repeatedly in studies of foreign language vocabulary learning (see Pressley, Levin, and McDaniel, 1987), they appear to be little used in language classrooms.

In particular, relatively little research has been done on the effect of using aural imagery--one aspect being the phonological aspects of words--in order to store those words in the mental lexicon, or mental dictionary. Research in this area seems to be needed considering the fact that many linguists including Nattinger (1988) say that form may be more important than meaning in remembering words. To fully acquire a word, is it not necessary to give considerable attention to the phonological shape and stress patterns of the word? Is a process of visual presentation plus reading really the best way to introduce new vocabulary if it ignores pronunciation of the words?

These are the questions Channell (1988) asks in her article "Psycholinguistic considerations in the study of L2 vocabulary", and these are the questions that will be the focus of the present study. Channell argues that in languages where words have individual stress patterns, such as English, methods used to introduce new vocabulary to

learners should help them internalize accurately the pronunciation of individual sounds, the number of syllables, and the stress patterns of the words. She argues that syllable structure and stress, which are extremely important in verbal comprehension and production, have not gotten the attention they deserve in English language teaching. The emphasis in introducing new vocabulary through reading has been on meaning, not on the sounds of new words.

However, psycholinguistic memory research supports the importance of phonological aspects of words for their storage in the mental lexicon, or mental dictionary. Channell, for example, discusses some relevant theoretical and descriptive work in first language acquisition and its possible application to second language acquisition. A particularly relevant study is Fay and Cutler's (1977) analysis of malapropisms, slips of the tongue in which one accidentally says a word that is similar in sound but not similar in meaning to the intended word. Fay and Cutler found that malapropisms often had the same number of syllables, same stress patterns, and similar phonemes as the target words (e.g. "determination" for "denomination").

The existence of malapropisms led them to hypothesize that the mental lexicon used for production is not arranged first according to meaning, for if this were true, malapropisms would not exist; words with similar pronunciation would not have any access channels in common. Instead, they propose a single lexicon arranged to be maximally useful for the comprehension device: a single listing based on phonological arrangement with access by two different networks, one phonological and one semantic. According to the model, if one were to err slightly in production in homing in on the intended word in the mental lexicon, one would choose a word similar in sound but not in meaning to the intended word.

Brown and McNeill's (1966) famous "tip of the tongue" experiment also supports the notion that phonological properties are important for

the recall of a word to be used in production. In their study, speakers were asked for words to fit definitions. Those who could not find any correct word but had it on the tip of their tongue, could often supply correct information about the word's first and last phonemes, the number of syllables, and the stress patterns.

In addition to being important in production, a word's sound is probably even more important in comprehension. In fact, in word recognition and comprehension, Garnham (1985) says it is best to think of the lexicon as not containing meanings but rather, pointers to meaning, with the structure of words (shape and sound) as well as contextual information being the most important aids in word identification. In Fay and Cutler's (1977) description of spoken comprehension, for example, a sound wave is identified first according to syllable and stress, and then by individual phonemes. Tarone's (1974) speech perception model also asserts that learners rely on selective processing, particularly stress patterns, to determine what is important.

In written word recognition and comprehension, phonological information may also be important. The controversial phonological recoding hypothesis, for example, maintains that a word's orthographic features must be recoded phonologically before they can be compared to features in the mental lexicon (Vellutino, 1982). A number of word recognition models are based on indirect evidence of phonological recoding (Gibson, 1965, cited in Vellutino, 1982; Gough, 1972; Spoehr and Smith, 1973). The studies supporting phonological recoding have involved lexical decision or editing tasks (Conrad, 1964; Corocan, 1966; MacKay, 1972; Meyer, Schvandevelt and Ruddy, 1974) and reading tasks (Hardyck and Petrinovich, 1970). One particularly convincing study by Spoehr (1978) found that words containing letter clusters that can be assigned a single phoneme (e.g. SH A R K) can be detected more accurately than letters embedded within words that are comprised only of

single-letter phonemes (e.g. S T A R K). This can be viewed as evidence of phonological recoding because parsing, the dividing of the word into parts, cannot be done visually as is the case with syllables or letter clusters. Parsing, in this case, has to be done verbally because the phoneme is a verbal unit.

A strong view of the phonological recoding hypothesis says that it is mandatory in written-word recognition. A more moderate view asserts that phonological recoding is only one of several strategies used to recognize written words, for example, to aid identification of orthographically similar words such as "saw" and "was" (Vellutino, 1982). Whichever view one takes, it is clear that an understanding of grapheme-phoneme correspondences is important to successful reading. Studies have shown that in comparison to normal readers, poor readers have difficulty phonologically recoding visual information (Liberman, Schankweiler, Liberman, Fowler and Fischer, 1977; Snolwing, 1980).

In conclusion, it appears that a word's phonological characteristics--its stress, number of syllables and phonemes--are important in recall and spoken and written comprehension. The recent trend has been to introduce new vocabulary through reading with emphasis on the meaning, not the sound, of new words. Perhaps, however, associations that are both semantic and phonological would be the most helpful in aiding the comprehension and recall of new vocabulary words. This speculation leads to several hypotheses.

HYPOTHESES

Hypothesis 1

ESL students introduced to new words in both visual and auditory context will have greater recall of the words than those students introduced to the same words in a visual context alone.

Part 1A: Students learning new words through reading and writing and listening and pronunciation practice will have greater recall

of the words immediately after the lesson than those learning the same words through silent reading and writing alone.

Part 1B: Students learning new words through reading and writing and listening and pronunciation practice will have greater recall of the words two weeks after the lesson than those learning the same words through silent reading and writing alone.

Hypothesis 2

ESL students introduced to new words in both visual and auditory context will have greater comprehension of the words in written form than those students introduced to the same words in a visual context only.

Part 2A: Students leaning new words through reading and writing and listening and pronunciation practice will have greater comprehension of the words in written form immediately after the lesson than those learning the same words through silent reading and writing alone.

Part 2B: Students learning new words through reading and writing and listening and pronunciation practice will have greater comprehension of the words in written form two weeks after the lesson than those learning the same words through silent reading and writing alone.

RESEARCH QUESTIONS

Although the main focus of this study will be the effect of phonological instruction on the recall and comprehension of new vocabulary words, the use of other vocabulary learning and memory strategies will also be explored. The purpose of this subcomponent of the study is to shed some light on what vocabulary strategies learners use the most and which ones appear to be the most effective in aiding recall and comprehension of new words. The following research questions will serve as a guide:

Research Question 1

How often do the English as a second language (ESL) learners use remembering strategies in comparison to the other groups of learning strategies described by Oxford (1990): using all your mental processes; compensating for missing knowledge; organizing your learning; managing your emotions; and learning with others? What conclusions can be drawn about which strategies are the focus of ESL teaching in higher education institutions in the United States?

Research Question 2

Which vocabulary remembering strategies are most commonly and least commonly used by the ESL students? (The remembering strategies included are those defined by Oxford (1990): thinking of relationships between what one knows and new English words; using new words in sentences; connecting the sound of a new word and an image of the word; making a mental picture of a situation in which the word would be used; using rhymes; using flashcards; physically acting out words; reviewing lessons often; and remembering words by thinking of their original location.)

Research Question 3

Which mental process strategies related to vocabulary learning are most commonly and least commonly used by the ESL students? (The vocabulary-related mental process strategies included are those described by Oxford (1990) as saying or writing new words several times; practicing the sounds of English; using English words in different ways; reading for pleasure; looking for similar words in one's native language; finding patterns in English; and finding the meaning of a word by dividing it into parts.)

Research Question 4

Of all the vocabulary learning strategies mentioned in Oxford's (1990) learning strategies questionnaire, including guessing meaning

from context, which are the most commonly and least commonly used by the ESL students?

Research Question 5

Are there any significant correlations between overall use of remembering strategies or mental process strategies and scores on vocabulary recall and comprehension tests?

Research Question 6

Are there any significant correlations between specific remembering strategies and scores on vocabulary recall and comprehension tests? If so, what do these correlations suggest?

Research Question 7

Are there any significant correlations between vocabulary- related mental process strategies and scores on vocabulary recall and comprehension tests? If so, what do the correlations suggest?

Research Question 8

Is there a significant correlation between the guessing meaning from context strategy and scores on vocabulary recall and comprehension tests? If so, what does this correlation suggest?

SUMMARY

In summary, the primary purpose of this study is to test the effectiveness of phonological instruction in aiding word recall and comprehension. In addition, the study looks at other vocabulary learning strategies--how often they are used and how useful they appear to be. The following discussion will, it is hoped, convince more ESL instructors that vocabulary acquisition does not happen by process of osmosis. It is a language learning skill that requires specific strategies.

CHAPTER II

REVIEW OF THE LITERATURE

PSYCHOLINGUISTIC RESEARCH INTO THE STRUCTURE OF THE MENTAL LEXICON AND THE IMPORTANCE OF PHONOLOGICAL ASPECTS OF WORDS IN AIDING MEMORY

Reading has traditionally been the most frequently-used method of presenting new vocabulary, especially in second language course books. In addition, the current focus of vocabulary teaching has been on meaning, specifically guessing a word's meaning from context. Such a method, however, does not help one to recall a word or comprehend a word out of context. To fully acquire a word, is it not necessary to also give considerable decontextualized attention to the phonological shape and stress patterns of the word? Is visual presentation and reading really the best way to introduce new vocabulary if it ignores pronunciation of the new words?

In her article "Psycholinguistic considerations in the study of L2 vocabulary", Channell (1988) recommends that in teaching English words to second language learners, emphasis should be placed on the phonological aspects of the words: pronunciation of individual sounds, the number of syllables, and the stress patterns. She asserts that syllable structure and stress are extremely important in verbal comprehension and production of the English language, but unfortunately, they have been relatively neglected in vocabulary instruction.

Psycholinguistic memory research supports the importance of phonological aspects of words for their storage in the mental lexicon, or mental dictionary. Channell, for example, discusses some relevant theoretical and descriptive work in first language acquisition and its possible application to second language acquisition. She bases her

ideas mainly on the work of Fay and Cutler (1977) in which they argue that words in the mental lexicon are organized first by their phonological and orthographic structure, and then accessed by a network system that leads to meaning.

It is generally agreed that in word comprehension, the direction of processing is from form to meaning (Nattinger, 1988; Channell, 1988; Fay and Cutler, 1977); the shape of a word, orthographic or phonetic, is the pathway to meaning. In contrast, the direction of processing for word production is from meaning to form (Nattinger, 1988; Channell, 1988; Fay and Cutler, 1977); a word's meaning is converted into a phonological or orthographic shape for production. This has led to speculation that the mental lexicon could have two listings of words, one for each process (Dirven and Oakeshott-Taylor, 1985).

Fay and Cutler (1977), on the other hand, make a strong argument for the existence of a single listing based on phonological arrangement, with access by two different networks, one phonological and one semantic. They use malapropism research as evidence for this claim. Malapropisms are speech errors, or slips of the tongue, which have been used to great comic effect as with Richard Sheridan's famous character Mrs. Malaprop or with Archie Bunker ("We need a few laughs to break up the monogamy.") (Fay and Cutler 1977, p. 505). Malapropisms have three major characteristics: 1) the mistakenly-used word is a real word; 2) the target word and error seem unrelated in meaning; and 3) the pronunciation of the target and error are very similar (Fay and Cutler 1977, p. 505). Examples include "determination" for "denomination" and "participation" for "precipitation."

Fay and Cutler argue that the existence of malapropisms is evidence that the mental lexicon used for production is not arranged according to meaning, for if this were true, malapropisms could not exist; words with similar pronunciation would not have any access channels in common. They propose instead a single lexicon arranged on the principle of

maximum usefulness for the comprehension device. In this lexicon, it would be expected that near neighbors in the dictionary might be very similar in sound, and if the production device erred just a little in homing in on a particular word, then "the word it chose by mistake might sound very similar to the target word, but would be unlikely to bear any relation to it in meaning" (p. 511).

In their study, Fay and Cutler found that 87% of their collected malapropisms had the same number of syllables as the target words, and 98% had the same stress pattern (p. 508). Examples include "tambourines" for "trampolines" and "single" for "signal". This evidence led them to propose a mental dictionary that is arranged first by syllable structure and/or stress pattern, and only within these categories according to sound. This arrangement would be very useful for the comprehension device that has to segment sentences into words before it looks up these word in the mental dictionary. Furthermore, it would aid the comprehension of incomplete and distorted signals, for listing entries that have similar phonological properties nearer each other would facilitate comparison and choice of the best match.

To account for semantic errors (e.g. "It's so hot....I mean cold...in here"), Fay and Cutler hypothesize that the phonologically-arranged lexicon could be accessed by two different networks, one phonological and one semantic. In other words, a word could be accessed by a path system in which every fork in the system represents a choice between two or more features. Given a set of semantic features, the production device would proceed down the path, making a choice at every fork until the path ended at a particular word.

In addition, Fay and Cutler suggest that in comprehension, after a sound wave is identified according to syllables, stress and word boundaries, the phonemes are read from left to right. However, as Hurford (1981) points out, a left-to-right arrangement in the mental lexicon will not account for such malapropisms as "provocation" for

"indication" where malapropisms resemble each other not at their beginnings, but at their middles or ends.

Despite the controversy over how exactly phonological properties in the mental lexicon are read, there is substantial evidence that points to the importance of phonological properties in the organization of the mental lexicon. Much of the support comes from psycholinguistic studies such as Brown and McNeill's (1966) classic study of the "tip of the tongue" (TOT) phenomenon. The TOT phenomenon is a "state in which one cannot quite recall a familiar word but can recall words of similar form and meaning (p. 325)." In their study, Brown and McNeill induced the TOT state in experimental subjects by reading dictionary definitions of 49 low frequency English words and asking the subjects to produce the word defined. For example, the definition of "sextant" was read--"a navigational instrument used in measuring angular distances, especially the altitude of sun, moon, and stars at sea"--and subjects responded with words such as "astrolabe" and "protractor," which were similar in meaning, and "secant" and "sexton," which were similar in sound (p. 333).

In their study, only 30% of the words remembered were similar in meaning to the target word, while 70% were similar in sound. Brown and McNeill (1966) report that those that were similar in sound were phonologically related in the following ways: 1) both guess and target words often had the same number of syllables and the same stress assignment and 2) letter matches were frequent and showed a kind of serial position effect--matches were more common at the beginning and end of a word than in the middle. Such a finding is consistent with Fay and Cutler's (1977) model of the mental lexicon.

Brown and McNeill hypothesized a generic recall, or "faint entry," theory to account for the partial recall of words. In this theory, the mental lexicon is a kind of data bank with key-punched data cards marked for semantic and phonological features. Hatch (1983) says these data

cards must also be punched for syntactic class and selectional restrictions. In this system, during production, the cards are punched for certain features until the closest word to the target is found. In the TOT state, some aspects of the phonological structure are entered on the punchcards more faintly than others. For this reason, it is possible to access the correct meaning of a word without being able to retrieve all of its phonological properties as in "S____T" (two syllables, initial s, final t) (p. 334). It is possible that a word can be recognized without total storage of its phonological properties. Brown and McNeill assert that the most salient characteristics to be remembered for comprehension are probably number of syllables, stress and the beginnings and ends of words. If, however, the words are to be produced or recalled, all phonological characteristics must be stored in full (p. 335).

Tweney, Tkacza and Zaruba (1975) supported Brown and McNeill's experiment and their "faint entry" hypothesis with a slip of the tongue study. By obtaining the same kinds of results with slips of the tongue related to high frequency words, they succeeded in discounting the criticism that the hypothesis is possible for only low frequency words. Supporting both Fay and Cutler (1977) and Brown and McNeill (1966), they found that the great majority of slips of the tongue that they made were similar in sound rather than in meaning (202 similar sounding words compared to 32 similar meaning words). Furthermore, they found that 80.2% of those similar in sound had the same number of syllables as their target and 92.1% had the same stress assignment. The probability of a sound match at the beginning or end of words was greater than the probability of a match somewhere in the middle (p. 393).

In another study, which was the most recent one found, Seibert (1927) found that in learning foreign vocabulary for productive use, saying the words aloud brought faster learning with better retention than studying silently or with writing practice. Again, this evidence

points to the importance of phonological features in memory.

Whereas all of the above studies stress the importance of phonological properties of words in long-term memory, a number of studies point to phonological characteristics as more salient in short-term memory. Craik and Lockhart (1972), for example, say that verbal items are usually coded phonemically in short-term storage but largely in terms of their semantic features in long-term memory. After perception, a new vocabulary word is held in short-term storage and then either forgotten or transferred and retained in long-term memory. It appears, then, that the longer a word can be recycled phonemically in short term memory and the more semantic associations that can be made with the word, the more likely that it will be transferred to long-term memory.

Short-term storage, then, is an important first step to eventual long-term memory of a word. Several studies suggest the importance of phonemic features in short-term memory. Conrad (1964), for example, shows a clear relationship between acoustic similarity and errors in the recall of letters and digits. Even with visual presentation of the material to be memorized, short-term recall errors were similar to hearing errors when the signal was partially masked with white noise.

Drewnowski and Murdock (1980) extended the research to vocabulary words, testing the short-term recall of lists of words from a very large and unfamiliar vocabulary. They found in their analysis of words partially recalled that the intrusion errors, though seemingly unrelated in meaning to the target words, tended to share "such auditory features as the number of syllables, the syllabic stress pattern, the identity of the stressed vowel, and the identities of initial and terminal phonemes (p. 330)." The features that most often served as cues to recall were the syllabic stress pattern and the identity of the stressed vowel. To explain the evidence, Drewnowski and Murdock (1980) suggest that in the course of recall, the subject refers first to the

lexical information and when this is exhausted, turns to the available auditory trace for information that will aid recall.

This suggestion is consistent with Underwood's (1969) claim that "the greater the meaningfulness of the material being stored as a memory, the greater the dominance of the verbal associative; hence, the less prominent the role of the acoustic attribute" (p. 567). It is also consistent with Henning's (1973) study of recognition errors made by second-language learners. In this study, Henning found a significant positive correlation between semantic encoding and language proficiency. In other words, learners at a low-proficiency level appeared to register vocabulary in memory more by sound than by meaning.

Rather than view this as evidence that vocabulary teaching should focus entirely on meaning instead of sound, the results can be viewed as evidence of a developmental process which can be taken advantage of in vocabulary teaching. Perhaps it would be best to emphasize the sound and spellings of words when they are first introduced, as in selective listening, aural discrimination, songs, rhymes, etc. After this kind of auditory introduction of new vocabulary, meanings could be practiced with semantic field and collocation exercises, synonym and antonym games, etc.

Summary

This section has reviewed indirect evidence that there is one mental lexicon with pronunciation, in particular word stress and syllable structure, as high level organizers. This proposed lexicon is accessed both phonologically (in perception) and semantically (in production) (Fay and Cutler, 1977). Furthermore, the importance of pronunciation in both long and short-term memory has been described, as well as the importance of semantic features. However, the "prediction that associations which are both semantic and phonological in nature are most helpful in aiding recall of vocabulary invites empirical testing" (Channell 1988, p. 93).

WORD RECOGNITION AND THE CONTROVERSY OVER PHONOLOGICAL RECODING

Word recognition, or identification of words, is an early process in comprehension. It is necessary to recognize a word before its meaning can be decided. In word recognition, incoming perceptual information must activate stored knowledge in the mental lexicon: knowledge about the spelling, pronunciation, and part of speech of a word. Garnham (1985) says that meanings are probably not stored in the mental lexicon, for meanings would unnecessarily complicate the system for identifying words. Instead, he says the lexicon probably has pointers to meaning.

To recognize words, Garnham (1985) asserts that two kinds of information are used: perceptual and contextual. Perceptual information is pattern recognition of the sounds, shapes, length, etc. of words. Contextual information is the surrounding discourse, pictures, objects in the real world, and shared knowledge. Garnham discusses how both kinds of information are helpful in lexical access--retrieving a word from the lexicon as a possible candidate--and eventual word recognition of the remaining candidate.

The recognition of words in spoken and written language is very different. Spoken word recognition has been relatively neglected in psycholinguistic research, so only two models will be discussed here. In his model of second language processing, Neisser (1967) takes a developmental point of view. He claims there are two general stages in speech comprehension--a non-linguistic stage and a linguistic one. In the non-linguistic, early stage of learning to comprehend, learners rely on selective processing because they cannot cope with everything. One unconscious strategy is to use an utterance's rhythmic structure (the alternation of stressed and unstressed syllables) to help select what is important to store in short-term memory. Based on the rhythmic structure, potentially meaningful distinctive phonemic features, syllables or words are picked out and the speaker forms a hypothesis as

to the possible meaning based on context. In the second developmental stage, the input is analyzed according to language-specific grammar rules. This model emphasizes phonetic analysis as the first step in learning to recognize words, a step that comes before semantic and syntactic analysis.

In contrast, Marslen-Wilson and Tyler (1980) propose an interactive language processing model in their theory of spoken word recognition. As in other speech recognition models, phonological information is activated early in word-recognition; acoustic input is matched against possible word candidates immediately after a word is encountered. However, this model differs from serial models in which the flow of information can go only in one direction--from the phonological level to the lexical, syntactic and finally to the semantic level. Instead, Marslen-Wilson and Tyler propose an interactive language processing model in which lexical, syntactic and interpretative knowledge sources communicate and interact freely during processing. In other words, the authors view spoken word recognition, after initial phonological matching, not as a series of stages, but as a system where all aspects--phonological, syntactic, semantic and contextual--are mutually available and interact freely to speed up the recognition process.

In the recognition of alphabetically written words, there are two major classes of theories: the direct or orthographic theory and the indirect or phonological one. Vellutino (1982) gives a complete overview of the two contrasting classes of theories. The direct access theorists claim that a word's visual components are directly linked to its semantic and syntactic components in the mental lexicon. Indirect access theorists, on the other hand, say that a word's orthographic features must be recoded phonologically before they can be compared to features in the mental lexicon.

One well-known direct access model is John Morton's (1979) logogen

model. In this model, orthographic information feeds directly into a set of feature counters called logogens; one logogen corresponds to each word or morpheme. In addition, each logogen has a threshold level at which it fires for recognition. This model helps to explain why high frequency words are recognized more quickly than low-frequency words; they have a lower threshold level for recognition.

Indirect access models, on the other hand, question whether lexical access can depend solely on visual features. In these models, phonological recoding is necessary for recognition; there are grapheme-phoneme correspondence rules which translate letter patterns into the sound patterns of spoken words, and the mental lexicon is accessed only via these sound patterns. Garnham (1985) explains the two major reasons why some theorists support the phonological recoding hypothesis: 1) spoken language preceded written language in both individual and species development; and 2) learning to read is learning that certain visual patterns correspond in an orderly way to words already in the spoken vocabulary.

The phonological recoding hypothesis is a very controversial theory among word recognition researchers. However, a number of studies have indirectly supported the theory by showing that the sound of a visually presented word or letter string affects the way it is accessed. Rubenstein, Lewis and Rubenstein (1971), for example, tested the lexical decision times for two kinds of pronounceable non-words: ordinary non-words like "shart" and pseudohomophones like "brane" which sound like real words. The results showed that pseudohomophones took longer to reject. In testing the phonological recoding theory, Meyer, Schvaneveldt and Ruddy (1974) found that lexical decision was faster for rhyming pairs such as "bribe/tribe" than it was for visually similar but non-rhyming pairs such as "touch/couch". In another study, MacKay (1972) found that subjects could easily detect misspellings that sounded different from the target word (eg.-wark, work), but had difficulty

spotting misspellings that did not change the sound of the word (eg.-werk, work). All of these studies suggest that the way a word sounds affects lexical access and that perhaps the lexicon is arranged first by sound to aid word recognition. (For further studies that support the phonologic recoding hypothesis, see Conrad (1964), Corocan (1966) and Hardyck and Petrinovich (1970).)

Several word recognition models support the theory that lexical access involves phonological recoding of subword units through the use of grapheme-phoneme correspondence rules. (See, for example, Gough's Serial Processing Model and Gibson's Cluster Model, both described in Vellutino (1982).) Spoehr and Smith's Vocalic Center Group Theory (1975) is one such recognition model. A Vocalic Center Group (VCG), the smallest pronunciational unit, is a letter string with one vocalic element, a vowel or diphthong, typically combined with one to three consonants or none (Hansen and Rogers, 1965, cited in Vellutino, 1982). In Spoehr and Smith's word recognition model, a person parses a word into one or more VCGS in an effort to match these units with phonological representations that will access the lexicon and cause recognition.

Evidence for VCGs comes from several studies, one in which Spoehr and Smith (1975) found that: 1) words and pronounceable pseudowords (blast, blost) were better perceived than unpronounceable letter strings; 2) unpronounceable strings comprised of phonotactically legal spelling patterns (blst) were better perceived than those that were randomly arranged and violated phonotactic rules (lstb); and 3) syllabic recoding involved vowel insertion (blst to blast).

Spoehr (1978) found even more convincing evidence for phonological recoding in a study that found that words containing letter clusters that can be assigned a single phoneme (SH A R K) can be detected more accurately than letters embedded within words that are comprised only of single-letter phonemes (S T A R K). Vellutino (1982) asserts that

phoneme length is better proof of the phonological recoding process in word recognition than syllable length and spelling pattern contrasts. This is because the parsing of syllable and letter clusters could occur exclusively on the basis of the visual aspects of a word, while this could not happen in the case of parsing at the phonemic level because the phoneme is a verbal, not a visual, unit.

The phonological recoding hypothesis, however, has had its share of critics. Forster and Chambers (1973) challenged the hypothesis by saying that if grapheme-phoneme conversion is necessary for lexical access and pronunciation, naming speed should be the same for words and pronounceable pseudowords. However, in their study they found that words were named faster than nonwords. In its purest form, Garnham (1985) says the phonological recoding process would claim that the phrase "Two bee oar knot to bee" could be easily read because it is pronounceable, but this is clearly not the case. Similarly, Vellutino (1982) asserts that the theory cannot explain why readers can tell the difference between homophonic words (flower/flour) and homographic words (bank/bank).

To account for the disparities in research findings, a dual access hypothesis has been proposed for visually-presented words. In this well-accepted hypothesis, visually-presented words can be accessed in the mental lexicon either by phonological recoding or direct visual access (Garnham, 1985). As Vellutino (1982) hypothesizes, phonological recoding may be used only in certain circumstances (e.g. with pseudowords when lexical access is not necessary or with difficult words and sentences that have unfamiliar ideas).

Vellutino (1982) suggests that the lexicon is accessed by multiple routes; in other words, a skilled reader has alternative processing strategies and these strategies interact in word recognition in the most efficient manner. Written word recognition, in his view, is the cross-referencing and integration of a word's visual, phonological, semantic

and syntactic components. Skilled readers have a variety of means of differentiating and coding distinguishing word features to allow access to the lexicon: 1) associations between a word's visual properties and its semantic, syntactic counterparts; 2) spelling-sound relationships; 3) sight words; 4) the ability to dissect words to differentiate them from orthographically similar words; and 5) skill at guessing from context. For example, highly discriminable words such as "zero" can be processed holistically as a unit. In contrast, pronounceable pseudowords like "glurk" would be processed at the letter cluster level, while highly similar words such as "meat" and "mean" would be distinguished by their component letters (Vellutino, 1982).

In Vellutino's view, phonological information can be important in both enhancing and monitoring direct access operations. The phonological characteristics of a letter string, for example, will be very important in the initial learning of more abstract words where reliance on structural information, like spelling-sound correspondences, will aid identification. In addition, phonological recoding could be important in the identification of orthographically similar words such as "was/saw" and "when/where". Spelling-sound associations may also be important in identifying orthographically regular, ruled-based words (Vellutino, 1982).

Vellutino (1982) gives several examples where spelling-sound correspondences would be important. First, we rely on pronunciation to process "father" not as "fat-her" but as "fa-ther." Also, a child probably holistically processes the word "lion" until he or she meets the word "loin." Then, it is possible that the child makes use of spelling-sound variance to process "lion" as a four phoneme unit (l-i-o-n) and "loin" as a three-phoneme unit (l-oi-n) (p. 132).

In comparison studies of poor and normal readers, it was found that poor readers are deficient in phonemic segmentation; in other words, they have difficulty encoding information phonologically. Liberman,

Shankweiler, Liberman, Fowler and Fischer (1977), cited in Vellutino (1982), discovered that poor readers did not perform as well as normal readers on short-term memory of rhyming and nonrhyming letters presented visually. Furthermore, the difference in performance with the two types of words was greater for normal readers than for poor readers; the normal readers were more inclined to recode phonologically and, therefore, were more confused than the poor readers by rhyming letters. Vellutino and Scalon (1979), cited in Vellutino (1982), also found that poor readers have a basic deficit in phonological memory which affects object naming and alphabetic coding. Similarly, Snolwing (1980) discovered that when compared to normal readers, dyslexics were impaired in grapheme-phoneme conversion.

Therefore, although phonological recoding is probably not mandatory in all cases of word recognition, it seems to be an important alternative strategy. Vellutino (1982) asserts that normal readers have words they can identify on sight, but as they become more skilled they are able to use other strategies such as spelling-sound correspondences to identify new words. Some poor readers, on the other hand, may try to memorize all words and may not have a means for discriminating visually-similar words or readily identifying new words because they do not have a sufficient repertoire of spelling-sound relations. Another type of poor reader may put too much reliance on spelling-sound relations in reading and may not rely enough on meaning, context, and sight words (Vellutino, 1982). A balance of processing strategies seems to be the key to success.

Summary

It is accepted that phonological information is activated early and is a necessary component of spoken word recognition. Phonological recoding of visually-presented material, however, remains controversial. Indirect access theorists claim that phonological recoding is mandatory in written word recognition. Direct access theorists, on the other

hand, assert that visually-presented words access the mental lexicon directly. The truth probably lies somewhere in between. The use of grapheme-phonological correspondences is most likely an important strategy of skilled readers but is probably not always necessary.

VOCABULARY LEARNING STRATEGIES FOR COMPREHENSION AND PRODUCTION

In learning a new vocabulary word, it is generally assumed that learners gain receptive knowledge of new words before active control (Channell, 1988). In other words, comprehension, the ability to recognize a word and recall its meanings, is believed to precede production, the ability to retrieve the word from memory and use it appropriately and naturally in a given situation (Nation, 1990; Nattinger, 1988). This assumption gives precedence to comprehension in language teaching. A word cannot be used unless it is first understood.

In both comprehension and production, Nation (1990) says that in order to "know" a word, one needs to have knowledge of the form, position, function, and meaning of the word. The form of a word is its pronunciation and spelling. The position of a word includes the grammatical patterns it occurs in and the words or types of words that typically precede or follow it (collocations). Function is the frequency and appropriateness of a word in different situations. Finally, the meaning of a word comprises the concept of the word and the associations one makes when encountering the word (Nation, 1990). These are the components of knowing a word.

To teach comprehension of an unfamiliar word, Nattinger (1988) says the instructor must first enhance the understanding of the word and then encourage strategies for storing that word in memory. Guessing vocabulary from context is the most frequent and useful way to discover and understand the meaning of a new word. Miller (1978) suggests at least four sources for discovering a particular word's meaning: the situational context, the discourse topic, the individual's background

knowledge about the discourse topic, and the immediate linguistic context.

Linguistic context clues, though probably not the most important way to guess vocabulary, have been the most researched and frequently taught method. One type of linguistic clue in reading is to look at the relationship between the clause or sentence containing the unknown word and other sentences or paragraphs. Relationships showing cause and effect, contrast, exemplification, description, synonyms and antonyms can help a reader to guess a word's meaning. Obtaining clues from prefixes and suffixes is another popular method for teaching guessing although Nation (1990) warns that overusing this method can result in twisting the interpretation of the context.

Guessing from context is not only an excellent way to introduce new words but is also an important strategy for improving reading ability. According to Nation (1990), about 123,000 English words are low frequency words that make up only 2% of any text. Because there are so many of these words (mostly Greek, French, and Latin in origin), and because they occur so rarely, Nation says it is really not worth the teacher's or student's time and effort to directly study them. Teaching guessing strategies is a much wiser choice than memorizing. Furthermore, guessing is an important strategy for second language learners who must try to overcome the enormous difference in vocabulary size between themselves and native speakers.

Stevick (1976) says that words are easier to learn in a meaningful context than in isolated lists because the context permits more complex processing. According to Craik and Lockhart (1972), the greater the depth of processing (cognitive depth) the more persistent the memory of these words. Presenting words in context also demonstrates the richness of words and the complex patterns of meaning relationships that one needs to learn in order to really "know" a word.

There has been disagreement, however, on whether presenting words

in context only is the best way to help students store the words in memory. Sternberg (1985), for example, argues that the learning-from context method is best for teaching "learning-to-learn skills", but does not help students to remember specific words (p. 104). In fact, in studies of both children and adults, Pressley, Levin and McDaneil (1987) found that subjects were consistently more successful in remembering vocabulary learned with mnemonic approaches than with contextual ones. The authors state that to remember an unfamiliar word, one must make an associative link between the word and its definition. They argue that although there is a lot of literature documenting that meaningful semantic contexts can enhance individual item recall and recognition, mnemonic techniques are still more successful because they operate on the associative link, not just on the meaning of the word.

It is likely that a combination of both techniques would be ideal for teaching vocabulary--contextual approaches to introduce and analyze new words and mnemonic approaches to store them and their definitions in memory. Mnemonic devices are successful in aiding memory because they emphasize the forms of words which Nattinger (1988) says may be more important than the meanings in remembering.

The best-studied of the mnemonic devices is the keyword method, a remembering strategy that uses auditory and visual associations. In this method described by Meara (1980), the target-word is first associated with a phonetically similar word in one's native language (called a "keyword"). Then the keyword is associated with the meaning of the target word by means of a visual image. Oxford (1990) illustrates the technique with the French word "potage" (soup). To remember the word "potage", the English speaker could associate it with a pot and then picture a pot full of "potage".

Such memory devices would help second language students to remember new words after they have been introduced. However, these methods would give language learners only receptive knowledge and partial productive

knowledge of the words. Language learners would still not know how to use the words appropriately and naturally in context. Although this partial knowledge could be adequate for the majority of words, it would not be adequate for what Nation (1990) describes as the approximately 2000 high-frequency words that make up 87% of the running words in a text. Because these words occur so frequently, a language teacher should be sure that students have full productive command of them. If the language students are secondary or university students, Nation (1990) also recommends that they have productive knowledge of what he has classified as the 800 most common academic vocabulary words appearing in textbooks.

Giving students productive knowledge of words is a long process. The best way to teach productive knowledge of words is first to ensure that the students have receptive knowledge of these words. Afterwards, Nattinger (1988) recommends that the emphasis be on meaning because it is meaning that guides one to an appropriate form for a particular situation.

In production, psycholinguistic studies of speech errors provide evidence that words with like meanings are "close together" in the mental lexicon. Channell (1988) discusses two types of speech errors: 1) the "semantic error" in which the error and target word are related in meaning as in "This room is too damn hot---cold; and 2) the "blend" in which a nonexistent word seems to consist of a blend of sound from two words that are close together in meanings as in "sleat" (slightest/least). Both speech errors point to meaning as the route to word production.

Recent vocabulary techniques make use of this evidence. Rudzka, Channell, Ostyn, and Putseys (1981, 1985), cited in Channell (1988), have produced two books using semantic fields and componential analysis to present vocabulary. These techniques present semantically related words together and show their features and relationships to one another.

For example, the words "chop", "dice", "cube", "shred", "slice", "mince", and "grate" could be presented together as various ways to reduce something to small food to small bits (Rudzka et al., 1985, cited in Channell, 1988). Words in a given semantic field may be related to one another as synonyms (couch, sofa); coordinates (oak, elm); superordinates (skunk, animals); and subordinates (fruit, pear) (Nattinger, 1988). Semantic fields are useful in giving students a better understanding of a word by showing its associative bonds with other words.

Another important part of our knowledge of words is the syntagmatic aspect--how words combine with other words (Carter and McCarthy, 1989). The collocation technique uses syntagmatic associations to aid the learners not only in production but also in comprehension. Collocation techniques show students what words they can expect to find together. For example, the verb "to encourage" usually occurs in this form: "to encourage + animate noun + infinitive". This explains why "He encouraged the rock moving" is unacceptable.

Nattinger (1988) says that collocations are helpful in comprehension because they help language learners to better understand the meanings of words and to predict what kinds of words will follow the first part of a familiar collocation. This is useful in guessing meaning from context. He adds that collocations are also useful in production not only because they help students become aware of lexical restrictions, but also because they help students to remember language in "chunks". Nattinger (1988) asserts that these "pre-fabricated" units are a great aid to fluency.

A final common technique used to encourage productive use of new vocabulary is teaching new words based on a particular theme or situation. Second language teachers have for a long time organized their vocabulary lessons in this way (eg. - "At the Grocery Store"). Teaching words in a particular discourse is useful because it can give

personal significance to the words and practice opportunities to the students. Students can manipulate words in simulations of real-life experiences through role plays and writing activities. Nattinger (1988) says that students are more likely to remember words if they practice them through appropriate actions.

Summary

Because receptive knowledge of words precedes productive knowledge, vocabulary-teaching techniques should follow this order. A popular method of introducing vocabulary in ESL classes is to have students encounter new words in context and try to determine their meanings from contextual clues. Once students have some knowledge of the words and how they are used, memorization of the words and their definitions becomes very important. In memorization, a word's visual and auditory form is crucial. If the goal is only receptive knowledge of words, as would be the case with low-frequency words, then the process can stop here. Students can continue to meet these words in context to reinforce their memory of them.

If, however, the goal is productive knowledge of vocabulary words, then the emphasis should be on meanings and relationships between words. The techniques using semantic fields, componential analysis, collocations and situational sets, for example, would give learners more skill at using new words creatively. Because it is a long process to gain full productive ability with a word, however, those words taught for productive knowledge should be frequent and useful.

FINAL SUMMARY

Based on psycholinguistic research, it appears that the phonetic structure of words is a very important part of vocabulary acquisition. Language processing research demonstrates that knowledge of a word's phonological form, especially its stress and syllable structure, is crucial to its recognition in speech. Likewise, in written language,

utilizing grapheme-phoneme correspondences seems to be an important strategy for word recognition. Memory research has also found that the form of a word, especially its auditory characteristics, is necessary for its recall. In fact, it is possible that the mental lexicon is arranged phonologically to better aid comprehension.

With this evidence, it seems justified to hypothesize that silent reading is not the best way to present new vocabulary words to ESL students because it is a poor guide to important phonological properties of words such as the number of syllables, stress, and pronunciation. Furthermore, reading with all attention focused on meaning and no attention given to a word's form (spelling and sound) would not seem to be effective in aiding recall of words for productive use. What is more, silent reading will definitely not help those second language learners who have difficulty understanding spoken English because they do not yet understand the grapheme-phoneme connection. Nor will it help those learners who cannot be understood, not because they do not know the words, but because they cannot pronounce them correctly.

Perhaps it would be best to introduce new vocabulary words through listening alone or through reading aloud from written texts. Perhaps associations which are both semantic and phonological would be the most helpful in aiding the future comprehension and recall of new vocabulary words.

CHAPTER III

METHOD

Thirty-seven English as a Second Language students participated in a study in which eighteen were taught vocabulary words through silent reading/writing exercises, while nineteen were taught the same words through reading/writing exercises and the independent variable, pronunciation practice. Vocabulary words used in the experiment were those that none of the students knew, as was indicated in a word recognition checklist. Vocabulary lessons were designed by the researcher and were identical for both the control and experimental groups except that the experimental group was also given phonological information: audiotaped and written pronunciation instruction about the introduced words (number of syllables, stress, and phonemes). The experimental group was also asked to repeat the words aloud. The exposure time to words was identical for both groups.

Most subjects were foreign or immigrant students studying English as a Second Language at two Portland-Vancouver area higher education institutions in order to pursue an undergraduate degree in the United States. All students were enrolled in high-intermediate ESL reading and writing courses. The variability of vocabulary level, nationality and gender was controlled by assigning students to the control or experimental group with a stratified random sample.

In order to determine the effectiveness of phonological instruction in recognizing and remembering new vocabulary words, two post-tests were given immediately after the vocabulary lesson: a vocabulary recognition test and a vocabulary recall test. Modified versions of the same tests were given two weeks later to test subjects' long-term memory of the vocabulary words. In addition, a language learning strategy

questionnaire was administered to determine whether there were any correlation between vocabulary-learning strategies and scores on the vocabulary post-tests.

A pilot study of the above procedures was conducted with thirteen students enrolled in an advanced ESL writing course at a university in Portland. Based on pilot study observations, minor changes were made in the original procedure design. Vocabulary instruction for each new vocabulary word was reduced from 3.5 minutes to 2.5 minutes for both the experimental and control group because the attention span of the students dwindled significantly after one hour of intense vocabulary instruction. In addition, it was discovered that students in the experimental group were greatly distracted when the researcher read aloud the sentence-writing exercises on audiotape; it interfered with their attempts to write sentences. Therefore, the audiotaped pronunciation instruction was limited to the researcher reading aloud sample passages containing the new words and focused pronunciation of these words. In addition, the recall test was modified. (See Measures Section). Because of these changes, the pilot study test results were not included in the study. However, the students' learning strategies were correlated with their post-test scores to determine if there was any relationship. These statistics were included with those of the main study.

SUBJECTS AND SAMPLING PROCEDURE

The subjects were thirty seven high-intermediate English as a second Language (ESL) students enrolled in college preparation ESL reading and writing classes at two higher education institutions in the Portland-Vancouver area. In the results section, the two groups are identified as Level 3 students and English as a Non-native Language (ENL) students. Students in the Level 3 group were placed in high-intermediate classes with teachers' approval and/or English proficiency

scores measured by the Michigan Test of English Language Proficiency as 65-75 or the Test of English as a Foreign Language (TOEFL) as 451-480. Students in the ENL group were not placed into their class by any evaluation instrument but were comparable to the Level 3 group for several reasons: 1) they could communicate verbally with only slight hesitation and groping for words; 2) they could read, understand and summarize at least 75% of readings at the newspaper-popular magazine level; and 3) they could write simple essays following the basic rhetorical patterns and using compound sentences easily and complex sentences with some difficulty.

Because the focus of this study was vocabulary, the most important factor in determining the two groups' comparability was their vocabulary levels. Therefore, subjects were given Nation's (1990) "A Vocabulary Levels Test." According to the test results, both Level 3 and ENL students had mastered about 80% of the words at the 2000-word level. Both groups knew approximately one-third of the words from Nation's "A University Word List." However, there was a slight difference at the 3000 and 5000-word levels. ENL students appeared to know a few hundred more words than the Level 3 students at both these levels. For example, the results showed that the ENL students had mastered 80% of the 3000-word level while the Level 3 students had mastered only 60%. Similarly, ENL students knew 50% of the words at the 5000-word level while the Level 3 students knew 40% of these words.

To determine whether the differences were statistically significant, a two-factor analysis of variance (Anova) was used to compare total scores from the vocabulary levels test. It was found that the students at the two different institutions were relatively equal in vocabulary level, with the ENL group showing a slight tendency to be higher than the Level 3 group ($F_{1, 31} = 2.41, .1307$). However, the difference between the groups from the two institutions was not statistically significant. The difference could be attributed to the

fact that several of the ENL students had already lived in the United States for a little over a year, either as refugees or high school exchange students. These students had a slightly higher vocabulary level than the majority of the students who had been in the U.S. for an average of seven months.

The slight difference in vocabulary levels was not a crucial factor, however, because the subjects at both institutions were placed in either the control or the experimental group with a stratified random sample controlling for vocabulary level, nationality, and gender. The Anova test showed that the average vocabulary levels of the experimental group and of the control group were comparable; there was no statistically significant difference between the control and the experimental group ($F_{1,31} = .04, .8401$). See Table I for the results of the vocabulary level comparisons.

Nationality and gender were also used to assign subjects to either the experimental or the control group. There were eight males and ten females in the control group and nine males and ten females in the experimental group. The balance of nationalities between the control and the experimental group are shown in Table II.

RESEARCH DESIGN AND PROCEDURES

In a brief overview, subjects were first given Nation's (1990) "A Vocabulary Levels Test" and a checklist of approximately 200 words from his "A University Word List." The results of the vocabulary levels test were used to place subjects into control and experimental groups using a stratified random sample. In addition, the researcher chose twenty-four of the unknown words from the checklist to use in the vocabulary lesson. Five weeks later the control group and experimental group received the vocabulary introduction lesson, and recall and comprehension tests immediately after the treatment. Two weeks after the treatment, subjects took recall and comprehension tests again as well as Oxford's

TABLE I

COMPARISON OF VOCABULARY LEVEL BETWEEN EXPERIMENTAL AND CONTROL GROUPS (GROUP A) AND BETWEEN LEVEL 3 AND ENL (BLOCK B)

Anova table for a 2-factor Analysis of Variance on Y₁: VOCAB. LVL.

Source:	df:	Sum of Squares:	Mean Square:	F-test:	P value:
GROUP (A)	1	4.89	4.89	.04	.8401
BLOCK (B)	1	284.78	284.78	2.41	.1307
AB	1	2.54	2.54	.02	.8845
Error	31	3663.32	118.17		

There were no missing cells found.

The AB incidence table on Y₁: VOCAB. LVL.

BLOCK:		LEVEL 3	ENL	Totals:
GROUP	CONTROL	9	7	16
		42.33	47.57	44.62
	EXPERIMEN...	11	8	19
		42.55	48.88	45.21
	Totals:	20	15	35
		42.45	48.27	44.94

TABLE II
NATIONALITY DISTRIBUTION IN THE CONTROL AND EXPERIMENTAL GROUPS

	Japanese	Arabic	Vietnamese	Korean	Chinese	Indonesian
Control	6	4	2	3	2	1
Exper.	7	3	3	2	3	1

(1990) "Strategy Inventory for Language Learning" to determine if and how individual learner strategies may have affected the results. A visual chart of the procedures and a more detailed description follows:

Week One: Administered vocabulary levels test and vocabulary checklist. Afterwards, chose twenty-four unknown words from the checklist and designed vocabulary lessons and tests based on these words. Assigned subjects to either the control or the experimental group.

Week Six: Administered the vocabulary lessons to the two groups followed immediately by recall and comprehension tests.

Week Eight: Administered similar, but rearranged recall and comprehension tests. Gave subjects the learning strategy test.

Week One

The subjects were given Nation's (1990) "A Vocabulary Levels Test" (a receptive knowledge test). The scores on this test were used to assign subjects to groups in a random, but stratified manner. The test was also given to ensure that all subjects knew a majority of words at the 2000-word level, for words at this level were used in the definitions for both the recall and comprehension tests.

At this time, the subjects were also given a checklist of approximately 200 words from "A University Word List" (Nation, 1990), which contains words that are common in university textbooks and therefore would be useful for students to know. Subjects were asked to put a check mark beside all those words they thought they knew in some way. Nation (1990) says that in checklists people tend to overestimate the words they know, so this technique was used to ensure that the words

chosen for the study were not words that the subjects already knew. Subjects were told that it was not necessary to try to remember the words because the most difficult words would be taught during the experiment and they would also receive "A University Word List" upon completion of the experiment.

Week Six

The researcher chose twenty-four unknown words to use in the experimental vocabulary lesson. The experiment was conducted five weeks after the checklist was administered to ensure that the subjects had forgotten the words.

Both the control group and the experimental group in the Level 3 study received the treatment in a language laboratory at the same time. To ensure that the control group would not be distracted by the experimental group who were pronouncing words aloud, the groups were seated at rows of carrels on opposite sides of the room. However, because of the language laboratory arrangement, it was not possible to place the groups very far apart. The control group could hear the experimental group, but with headphones on their words were muffled. At the ENL study site, there was not a sufficient language laboratory. Therefore, the ENL control and experimental groups sat around two different tables separated by dividers. They listened on headphones to tape recorders placed in the middle of their tables. Because of the difference in testing environments, the results from each test site were combined using the Anova two-factor analysis of variance to determine whether the different test conditions had any effect on the results (See the results section).

In the experimental lesson, both the control and the experimental groups received the same self-instruction vocabulary lesson that included: 1) a short written passage for each vocabulary word that introduced the meaning of the word and showed it repeated in sentential context a controlled number of times (modeled after exercises from

Barnard, 1972, 1975)); 2) sentence-writing exercises where students could practice using the new words (modeled after exercises from Nation, 1990:151); 3) sample answers for the sentence-writing exercises; and 4) a review cloze exercise after all the words had been introduced (See Appendix).

The control group received the written packet and proceeded with the exercises individually and silently, with no teacher intervention. The experimental group received the same written packet and did the same exercises, but were also asked to read along as the written material was read aloud on audiotape by the researcher. In addition, the experimental group heard explanations on the tape about the pronunciation of the words (stress, syllables, phonemes) and were asked to repeat the words aloud. The words in their written packet were marked to show syllable division and primary stress. After initial instruction, the experimental group also did not receive teacher intervention.

The vocabulary lesson was controlled for time. Both the control and the experimental group were given 2.5 minutes to work on the exercises for each word. When the time was up, the tape told the subjects to move on to the next word. Ten minutes was allotted for completion of the review cloze exercise. The total time for the vocabulary lesson was 70 minutes. After initial instruction, there was no researcher intervention except for clarification of directions.

After the lesson, the researcher collected the subjects' papers so they did not take them home to study. She told them that they would practice the words again in a later experiment, so there would be no need to study them at home. In addition, she promised to give them the vocabulary lesson and Nation's "A University Word List" after the experiment so they would not feel the urge to write down the words later at home.

Immediately after the lesson, the groups were tested first for

recall of the introduced words and then for comprehension (recognition) of the words (See Appendix for recall and comprehension tests). The recall test was given before the comprehension test so that subjects did not use the comprehension test as a review for the word recall test.

Week Eight

Two weeks after the lesson in the same rooms at the same time of day, the groups were tested again for recall and comprehension of the words. In addition, they took Oxford's (1990) "Strategy Inventory for Language Learning: Version for Speakers of Other Languages Learning English" (See Appendix).

MEASURES

A Vocabulary Levels Test (Nation, 1990)

The scores from this test were used to place subjects in experimental groups. This instrument tests receptive knowledge of words at five levels: the 2000, 3000, 5000, university, and 10,000 word levels. The words in the test were chosen from Thorndike and Lorge's The Teacher's Word Book of 30,000 Words and checked against two other well-known word lists: West's General Service List for the 2000-word level and Kucera and Francis' Computational Analysis of Present-Day American English for other levels. Eighteen words are matched with definitions at each level, but actually thirty-six words are tested because there are eighteen distractor words to reduce the chance of guessing correctly.

To ensure validity, items put together in each section are in no way related in meaning so that test takers have no confusion over which word to choose if they know the meaning. In addition, the definitions are from a higher-frequency level than the tested words to ensure that the instrument is testing the words and not understanding of the definitions. However, Nation says the test is not suitable for those whose mother tongue is strongly influenced by Latin. These people can

obtain a high score at the university word level by guessing because many academic words are derived from Latin. Because the present study used university words in the vocabulary lessons, results from Latin American students were omitted.

Vocabulary Checklist

Subjects were given a check list of approximately 200 words taken from Nation's (1990) "A University Word List." They were asked to put a check mark beside every word they thought they knew in any way. Those words that no one knew were used in the experimental vocabulary lessons. Because ENL and Level 3 students did not know exactly the same words, half of the words in their lessons were the same and half were different. This should not have affected the results much because the lessons were carefully controlled for number of exposures to a word and length of time working with each word. In addition, because the words were all taken from the university list, they were of comparable difficulty.

Recall Test

The word recall test was created by the researcher but modeled after Brown and McNeill's (1966) "tip of the tongue" experiment. Subjects were given definitions in writing and asked to supply the corresponding words. Subjects were encouraged to guess the words and scores were tabulated according to how many phonological properties of each word the subjects could remember correctly. More specifically, a total of six points was given for each correct guess. Points were also given for partially correct guesses -- one point for each of the following: 1) correct number of syllables; 2) correct primary stress placement; 3) correct first letter; 4) correct last letter; and 5) resemblance in the middle of the word (two or more letters in the correct order).

In the pilot study, fourteen subjects were simply asked to divide

each of their words into syllables (e.g. - hun/gry) and to put an accent mark over the syllable that was stressed the strongest. However, even if the subjects wrote down words in their entirety, they often failed to indicate syllables and accents. This made tabulating scores difficult. For this reason, the recall test was modified for the main study. As before, subjects were asked to write down as many letters of the words that they could remember, but they were also asked to circle the number of syllables in each word and the number of the syllable with the primary stress. This encouraged guessing to a greater degree which was the desired result because, with prodding, students often remember more than they think they do. An example follows:

DEFINITION	WORD	# OF SYLLABLES	SYLLABLE WITH THE MOST STRESS
to make completely wet; soak	Saturate	1 2 ③ 4	① 2 3 4

After the first test-taking, the items on the test were rearranged so that subjects would not use their memory of the words' location on the page to help them in the second test-taking.

Comprehension Test

The comprehension test was designed to measure subjects' ability to recognize vocabulary words and their definitions in written form. It was a vocabulary/definition matching test modeled directly after Nation's (1990) "A Vocabulary Levels Test." In each section of the test, there were six vocabulary words that had to be matched to three definitions; the three extra words served as distractors to eliminate the possibility of guessing. To ensure understanding, the definitions were taken from The Longman Dictionary of American English which is based on 2000 common English words. As with the recall test, the comprehension test was rearranged with different distractors after it was given the first time so that subjects did not use their memory of the test to help them in the second test-taking. Furthermore, the test

was piloted and no changes were deemed necessary.

Strategy Inventory for Language Learning (SILL):
Version for Speakers of Other Languages Learning
English (Oxford, 1990)

The results from this test were correlated with subjects' word recall and comprehension scores to determine whether there was any possible relation between particular learning strategies and success in vocabulary learning. The SILL contains fifty items. Its five-point scale, in which subjects rated how often they used a particular strategy, ranges from "never or almost never" to "always or almost always." The answers are converted to numbers with the overall average indicating how often learners use learning strategies in general, and the average for each section showing how frequently learners use particular groups of strategies related to: remembering more effectively; using all mental processes; compensating for missing knowledge; organizing and evaluating learning; managing emotions; and learning with others. Of particular interest to the present study was how often subjects used particular remembering strategies such as using sounds and images and practicing words in sentences, and particular mental process or compensating strategies such as saying and writing new words and guessing new words from context. This will be discussed at length in the Results and Discussion Sections.

Earlier versions of the test were extensively field-tested and found to be highly valid and reliable (See Oxford, 1990:255 for details). The test has been used in many parts of the world with learners of many different languages. This shorter version for people learning English is at present being field-tested and analyzed. At this moment, the only available factor is that of "internal consistency" which is 0.95. (personal communication from Ilka Stoffer, research assistant to Rebecca Oxford, March 8, 1991). Validity and reliability information will be available later.

SUMMARY

This research was conducted to determine whether there was any difference in effectiveness between teaching vocabulary with phonological instruction or without it in terms of word recall and recognition. It was also undertaken to shed some light on the individual strategies language learners use to remember new vocabulary words and how these strategies relate to degree of success on vocabulary recall and comprehension tests.

CHAPTER IV

RESULTS

In this chapter the results of the various measures used during the research are reported: those of the recall tests, comprehension tests, and learning strategies questionnaire. In addition, results from the recall and comprehension tests are correlated with specific remembering strategies that will be discussed in detail later. Results will be described according to research hypotheses and questions. Table III summarizes the hypotheses findings.

TABLE III
SUMMARY OF HYPOTHESES FINDINGS

<u>Hypothesis 1A</u> Phonological instruction will aid word recall immediately after lesson.	NS	$F_{1,33} = .22, .6400$
<u>Hypothesis 1B</u> Phonological instruction will aid word recall two weeks after lesson.	NS	$F_{1,33} = .72, .4309$
<u>Hypothesis 2A</u> Phonological instruction will aid word comprehension immediately after lesson.	NS	$F_{1,33} = 7.31E-4, .9786$
<u>Hypothesis 2B</u> Phonological instruction will aid word comprehension two weeks after lesson.	NS	$F_{1,33} = 1.16, .2889$
NS = Not Significant at .05		

HYPOTHESES

Hypothesis 1

Students introduced to new words in both visual and auditory context will have greater recall of the words than those students introduced to the same words in a visual context only. To test this hypothesis, a researcher-designed recall test was given to 37 subjects in two different educational institutions. Eighteen subjects in the control group received visual vocabulary instruction without auditory input, while nineteen subjects in the experimental group received vocabulary lessons with visual and auditory input. The word recall tests were given immediately after the vocabulary lesson to test short-term memory and two weeks later to test long-term memory of the newly introduced words.

Hypothesis 1A: Students learning new words through reading and writing and listening and pronunciation practice will have greater recall of the words immediately after the lesson than those learning the same words through silent reading and writing alone.

A two-factor analysis of variance (Anova) was used to compare the results of the experimental group and the control group in both testing locations. This statistical analysis was chosen because of test condition differences between the Level 3 group and the ENL group that were beyond the researcher's control; Level 3 students sat at individual carrels during the experiment while ENL students sat around round tables. The two-factor analysis of variance is appropriate because it not only shows the variance between the experimental group and the control group (Group A), but also the difference between the Level 3 and the ENL group (Block B). If there is no significant difference between the results of the groups in the two different testing environments, then it is relatively safe to say that the different testing conditions did not affect the results of Group A too heavily. If, however, the differences in Block B are significant, then results of the recall test

can then be determined more accurately by showing the interaction of the two independent variables (experimental group and test conditions) and their effects on the dependent variable: the recall test.

In the first recall test taken immediately after the vocabulary lesson, there was a strong tendency for the Level 3 and the ENL group to be different although the difference was not significant at the .05 level ($F_{1,33} = 3.83, .0589$). The Level 3 group tended to have received higher scores than the ENL group. One possible explanation for this is that the ENL students sat around tables instead of at individual carrels, and therefore, may have been distracted by looking at each other. However, when the interaction of test conditions and experimental groups were compared, there was still no statistical significance ($F_{1,33} = .22, .6406$). The experimental group did not have significantly higher scores than the control group.

Although there was no statistically significant difference between the control and the experimental group, the experimental group showed a slight tendency to have higher recall scores as Figure 1 illustrates.

Hypothesis 1B: Those students learning new words through reading and writing and listening and pronunciation practice will have greater recall of the words two weeks after the lesson than those learning the same words through silent reading and writing alone.

For the second recall test given two weeks after the experimental lesson, the Anova two-factor analysis of variance showed no statistical differences between the experimental and control group ($F_{1,33} = .72, .4039$) or the Level 3 and the ENL group ($F_{1,33} = .02, .8816$).

Hypothesis 2

Students introduced to new words in both visual and auditory context will have greater comprehension of the words in written form than those students introduced to the same words in a visual context only. To test this hypothesis, subjects in the experimental and control groups were given a researcher-designed word comprehension (recognition)

Figure 1. Average scores of the experimental and control groups on the recall test given immediately after the lesson.

test.

Hypothesis 2A: Students learning new words through reading and writing and listening and pronunciation practice will have greater comprehension (recognition) of the words in written form immediately after the lesson than those learning the same words through silent reading and writing alone.

Again using the Anova two-factor analysis of variance, no statistically significant difference at the .05 level was found between the experimental and the control group ($F_{1,33} = 7.31E-4, .9786$) or between the Level 3 and the ENL group ($F_{1,33} = .12, .7305$). In fact, the scores differed very minimally.

Hypothesis 2B: Students learning new words through reading and writing and listening and pronunciation practice will have greater comprehension of the words in written form two weeks after the lesson than those learning the same words through silent reading and writing alone.

According to the Anova test, there was again no statistically significant difference between the experimental group and the control group on the word comprehension test ($F_{1,33} = 1.16, .2889$). In addition, no significant difference was found between the Level 3 and ENL groups ($F_{1,33} = .35, .5575$). Despite the lack of statistical significance, the experimental group had a very slight tendency to have higher scores on the second comprehension test than the control group. Figure 2 illustrates.

RESEARCH QUESTIONS

Research Question 1: Use of Learning Strategy Groups

How often do the English as a second language learners in the study use remembering strategies in comparison to the other groups of learning strategies described by Oxford (1990): using all your mental processes; compensating for missing knowledge; organizing your learning; managing

Figure 2. Average scores of the experimental and control groups on the comprehension test given two weeks after the lesson.

your emotions; and learning with others?

To determine how often the ESL students in the study use these learning strategies, Oxford's (1990) Strategy Inventory for Language Learning (SILL) was given to the 48 subjects participating in the main study and pilot study. Averages were computed for how often subjects used particular groups of learning strategies. The results are shown in Figure 3. According to the results, strategies to remember more effectively were the least used by the students followed by strategies to manage emotions and use all one's mental processes. The three strategies that students used the most were compensating for missing knowledge, learning with others, and organizing and evaluating learning.

Research Question 2: Use of Remembering Strategies

Which vocabulary remembering strategies are most commonly and least commonly used by the ESL students in the study?

To determine this, the SILL average for each particular remembering strategy was computed for the 48 subjects. The results are shown in Figure 4. The students said they seldom used flashcards to remember words; this was the least used remembering strategy. The second least used remembering strategy was physically acting out words. The strategies that were used "sometimes" were rhymes, remembering the location of words, making a mental picture of a situation to use the word in, and reviewing. The more commonly used strategies were connecting the sound of a word to an image of the word, using words in a sentence, and thinking of relationships between known things and new words. However, on the average, subjects said they used remembering strategies only seldom to "sometimes".

Research Question 3: Use of Vocabulary-Related Mental Process Strategies

Which are the most commonly and least commonly used mental process strategies related to vocabulary learning?

By averaging the SILL mental process ratings of the 48

Figure 3. How often subjects use particular groups of learning strategies.

Figure 4. How often subjects use particular remembering strategies.

participating subjects, it was found that the least common cognitive vocabulary-learning method was using words in different ways; it was used "sometimes", almost seldom. The two most commonly used mental process strategies to learn vocabulary were saying or writing new words several times and looking for similar words in one's native language. These strategies were used "sometimes" to "usually." Those strategies used "sometimes" were reading for pleasure, finding patterns in words, practicing English sounds, and finding meaning by dividing words into parts. See Figure 5.

Research Question 4: Use of All Vocabulary Learning Strategies

Of all the vocabulary learning strategies in Oxford's (1990) learning strategies questionnaire, including guessing meaning from context, which are the most commonly and least commonly used by the ESL students?

In looking at Figure 6, one can see that overall, remembering strategies were the least commonly used ways to learn vocabulary. Remembering strategies that were most unpopular were using flashcards, acting out words, using rhymes, remembering the location where a word was first seen, and making a mental picture of the situation in which a word would be used. Strategies for using all one's mental processes were more popular methods to learn vocabulary. By far the most popular ways to deal with vocabulary were the cognitive strategies of saying or writing new words several times and looking for similar words in one's native language, and the compensating strategy of guessing words' meanings from context.

Research Question 5: Correlations Between Use of Strategy Groups and Test Scores

Are there any significant correlations between overall use of remembering strategies or mental process strategies and scores on vocabulary recall and comprehension tests?

Scores from the second set of recall and comprehension tests given

Figure 5. How often subjects use mental process strategies related to vocabulary learning.

Figure 6. A comparison of how often subjects use vocabulary learning strategies under the categories of remembering more effectively, using all one's mental processes, and compensating for missing knowledge

two weeks after the treatment were correlated with the learning strategy scores from the questionnaire. It was felt that the ability to remember words two weeks after the treatment would more likely be a result of learning strategies rather than intelligence level. In contrast, the first tests of recall and comprehension given immediately after the treatment could give an advantage to more intelligent students rather than those with strategies to help long term memory. In addition, the strategies could have been correlated with the results of the second test divided by the scores of the first test to show what percentage of what students had learned that they remembered. However, this analysis would have given an advantage to subjects who had extremely low scores but the same scores on the second set of tests as the first set of tests merely from guessing. Therefore, the scores on the second set of recall and comprehension tests were considered more of an indication of learning strategy use.

To identify any possible correlations, the Spearman rank-order correlation coefficient was used. The test scores and questionnaire rankings were interpreted as ordinal data for the Spearman rho. In addition, the data was corrected for ties.

When correlating recall test scores with the average scores on the remembering strategies section of the questionnaire, a nonsignificant negative relationship was found ($Rho = -0.05$ ($n=48$, $p=.7082$)). The same was true in correlating comprehension test scores with the general use of remembering strategies ($Rho = -0.2$ ($n=48$, $p=.1636$)).

On the other hand, a significant positive relationship was found between vocabulary recall scores and overall use of mental process learning strategies. The Spearman Rho was 0.29 ($n=48$, $p<.05$). See Table IV. The relationship between vocabulary comprehension test scores and mental process strategies was also positive but not at a statistically significant level ($Rho = 0.12$ ($n=48$, $p=.408$)). It appears, then, that using mental process strategies related to vocabulary

TABLE IV
CORRELATION BETWEEN RECALL TEST SCORES AND
MENTAL PROCESS STRATEGIES

Spearman Corr. Coef. X ₁ : RECALL 2 Y ₂ : MENTAL PROCESS			
N	48		
ΣD^2	13045		
Rho	.29		
Z	2	p = .0453	
Rho corrected for ties	.29		
Z corrected for ties	1.97	p = .0486	
*X tied groups: 13		*Y tied groups: 12	

Note: 1 case deleted with missing values.

learning could have helped subjects to score higher on the recall test but not on the comprehension test.

Research Question 6: Correlations Between Remembering Strategies and Test Scores

Are there any significant correlations between specific remembering strategies and scores on the vocabulary recall and comprehension tests?

The Spearman rho was used to determine the relationship between scores on the recall and comprehension tests and the following remembering strategies: using new words in sentences, connecting the sound of a new word with an image of the word, making a mental picture of a situation in which the word might be used, using rhymes, and remembering the new word's location on a page, sign, etc.

There were no significant correlations found. The only remembering strategy positively correlated with the recall test scores was using the new words in sentences, but the correlation was not statistically significant at the .05 level (Rho=0.1 (n=48, p=.4826)). The other remembering strategies were negatively correlated with the recall test but at extremely insignificant levels: using sounds and images (Rho=-0.11 (n=48, p=.4595)); using a mental picture of a situation in which to use the word (Rho=-0.11 (n=48, p=.4375)); using rhymes (Rho=-0.04

($n=48, p=.7911$)); and remembering the original location of words ($Rho=-0.24$ ($n=48, p=.0991$)).

The relationships were similar between the word comprehension test scores and the use of specific remembering strategies. As with the recall test correlations, there was a nonsignificant negative relationship between the comprehension test scores and the strategy of using mental pictures to remember words ($\rho=-0.18$ ($n=48, p=.216$)) and between the comprehension test scores and the strategy of using rhymes to remember words. ($\rho=-0.26$ ($n=48, p=.0697$)). In addition, the relationship between the comprehension test scores and remembering the original location of a new word was negative, but in this case was significant at the .05 level. In other words, those who tried to remember the original location of words had lower scores on the comprehension test. As Table V illustrates, the Spearman ρ was -0.36 ($n=48, p=.0141$). The only other difference was that using words in sentences was negatively related to the comprehension test scores at a nonsignificant level ($\rho=-0.02$ ($n=48, p=.9068$)), while using the sound and image of words to remember them was positively correlated with the comprehension scores at a nonsignificant level ($\rho=0.07$ ($n=48, p=.6283$)).

Research Question 7: Correlations Between Vocabulary-Related Mental Process Strategies and Test Scores

Are there any significant correlations between vocabulary-related mental process strategies and scores on the vocabulary recall and comprehension tests?

Using the Spearman ρ , correlations were computed between the vocabulary tests and the following mental process strategy results: saying or writing new words several times, practicing the sounds of English, using new words in different ways, reading for pleasure, and finding the meaning of words by examining their parts.

TABLE V

CORRELATION BETWEEN COMPREHENSION TEST SCORES AND THE STRATEGY OF
USING THE ORIGINAL LOCATION OF WORDS TO REMEMBER THEM

Spearman Corr. Coef. X ₁ : COMP 2 Y ₈ : LOC		
N	48	
ΣD^2	24028.5	
Rho	-.3	
Z	-2.09	p = .037
Rho corrected for ties	-.36	
Z corrected for ties	-2.46	p = .0141
*X tied groups: 11	*Y tied groups: 5	

Note: 1 case deleted with missing values.

The results differed greatly from the correlations between the vocabulary tests and the remembering strategies in which most of the relationships were negative but at a nonsignificant level; there was a positive relationship between the recall test and all of the above mental process strategies. The positive correlation was significant at the .05 level for the following: practicing the sounds of English ($\rho=0.31$ ($n=48$, $p<.04$)); using new words in different ways ($\rho=0.32$ ($n=48$, $p<.03$)); and reading for pleasure ($\rho=0.28$ ($n=48$, $p=.0519$)). See Tables VI to VIII.

The recall/learning strategy relationship was positive but not significant with the strategies of saying and writing new words several times ($\rho=0.15$ ($n=48$, $p=.3033$)) and finding the meaning of words by examining their parts ($\rho=0.05$ ($n=48$, $p=.7151$)).

In looking at the relationships between the comprehension test scores and the vocabulary -related mental process strategies, there was a strongly significant positive correlation between test scores and two mental process strategies: practicing the sounds of English ($\rho=0.35$ ($n=48$, $p<.05$)) and using new words in different ways ($\rho=0.35$ ($n=48$, $p=.02$)). Tables IX and X show these results. There was also a positive relation between reading for pleasure and scores on the comprehension

test, but the relation was not significant at the .05 level. ($\rho=0.19$ ($n=48$, $p=.1969$)). The strategies of saying and writing new words several times and finding the meanings of words by examining their parts were negatively correlated with the comprehension test at a very slight level: repeating words ($\rho=-0.01$ ($n=48$, $p=.927$)) and examining the parts of words ($\rho=-0.05$ ($n=48$, $p=.7275$)).

Research Question 8: Correlation Between the Guessing from Context Strategy and Test Scores

Is there a significant correlation between the guessing strategy and scores on the vocabulary recall and comprehension tests?

Using the Spearman ρ , a statistically significant positive relationship was found between the guessing strategy and the recall test scores ($\rho=0.32$ ($n=48$, $p=.03$)). See Table XI. There was also a positive correlation between the guessing strategy and the comprehension test scores that was not statistically significant at the .05 level. The Spearman ρ was 0.23 ($n=48$, $p=.109$).

Table XII summarizes the statistically significant correlations found between use of specific learning strategies and scores on the vocabulary tests.

TABLE VI

CORRELATION BETWEEN RECALL TEST SCORES AND THE STRATEGY OF
PRACTICING THE SOUNDS OF ENGLISH

Spearman Corr. Coef. X_1 : RECALL 2 Y_{10} : S0U

N	48
ΣD^2	12124
Rho	.34
Z	2.34 $p = .0191$
Rho corrected for ties	.31
Z corrected for ties	2.13 $p = .0328$
*X tied groups: 13	*Y tied groups: 4

Note: 1 case deleted with missing values.

TABLE VII

CORRELATION BETWEEN RECALL TEST SCORES AND THE STRATEGY OF
USING NEW WORDS IN DIFFERENT WAYS

Spearman Corr. Coef. X_1 : RECALL 2 Y_{11} : WAYS

N	48
ΣD^2	11979
Rho	.35
Z	2.4 $p = .0165$
Rho corrected for ties	.32
Z corrected for ties	2.18 $p = .029$
*X tied groups: 13	*Y tied groups: 5

Note: 1 case deleted with missing values.

TABLE VIII

CORRELATION BETWEEN RECALL TEST SCORES AND THE STRATEGY OF
READING FOR PLEASURE

Spearman Corr. Coef. X_1 : RECALL 2 Y_{12} : READ

N	48
ΣD^2	12569.5
Rho	.32
Z	2.18 $p = .0294$
Rho corrected for ties	.28
Z corrected for ties	1.94 $p = .0519$
*X tied groups: 13	*Y tied groups: 5

Note: 1 case deleted with missing values.

TABLE IX

CORRELATION BETWEEN COMPREHENSION TEST SCORES AND THE STRATEGY OF
PRACTICING THE SOUNDS OF ENGLISH

Spearman Corr. Coef. X_1 : COMP 2 Y_{10} : SOU

N	48
ΣD^2	12479
Rho	.32
Z	2.21 $p = .027$
Rho corrected for ties	.29
Z corrected for ties	1.99 $p = .0465$
*X tied groups: 11	*Y tied groups: 4

Note: 1 case deleted with missing values.

TABLE X

CORRELATION BETWEEN COMPREHENSION TEST SCORES AND THE STRATEGY OF
USING NEW WORDS IN DIFFERENT WAYS

Spearman Corr. Coef. X₁: COMP 2 Y₁₁: WAYS

N	48
ΣD^2	11333.5
Rho	.38
Z	2.64 p = .0083
Rho corrected for ties	.35
Z corrected for ties	2.43 p = .015
*X tied groups: 11	*Y tied groups: 5

Note: 1 case deleted with missing values.

TABLE XI

CORRELATION BETWEEN RECALL TEST SCORES AND THE GUESSING STRATEGY

Spearman Corr. Coef. X₁: RECALL 2 Y₁₄: GUSS

N	48
ΣD^2	12010
Rho	.35
Z	2.39 p = .017
Rho corrected for ties	.32
Z corrected for ties	2.17 p = .03
*X tied groups: 13	*Y tied groups: 5

Note: 1 case deleted with missing values.

TABLE XII
SUMMARY OF STATISTICALLY SIGNIFICANT CORRELATIONS

+ Positive Correlation - Negative Correlation * = .05 ** = .01		
Comprehension Test Scores	Recall Test Scores	Learning Strategies
		Remembering Strategies
	+ *	Mental Process Strategies
		Using new words in sentences
		Using sounds and images
		Making a mental picture of a situation
		Using rhymes
- **		Remembering original location of words
+ *	+ *	Practicing the sounds of English
+ *	+ *	Using words in different ways
	+ *	Reading for pleasure
		Saying or writing words several times
		Examining parts of words
	+ *	Guessing meaning from context

CHAPTER V

DISCUSSION OF RESULTS

This chapter will discuss the results of the four hypotheses and eight research questions posed. It will also explain the findings of informal interviews of twelve ESL students involved in the study. The interviews were conducted to provide more detailed description of the vocabulary-learning strategies used by subjects and to note possible relationships between these strategies and vocabulary level.

DISCUSSION OF HYPOTHESES RESULTS

Hypothesis 1A

It was found that ESL students introduced to new words in both visual and auditory context did not have significantly greater recall of the words immediately after the lesson than those introduced to the same words through visual context alone ($p < .05$). However, there was a tendency for the experimental group who received listening and pronunciation practice in addition to reading and writing practice to score higher on the recall test than the control group who met new words through silent reading and writing only. The Level 3 experimental group averaged 32 points on the recall test, while the Level 3 control group averaged 20 points. Likewise, the ENL experimental group's mean score was 14, while the ENL control group's was 9.

These results suggest that pronunciation and listening practice provide a slight benefit to short-term memory of words approximately one hour after presentation. Supporting the importance of auditory features in short-term memory are Craik and Lockhart (1972) who say that verbal items are usually coded phonemically in short-term storage but largely in terms of their semantic features in long-term memory. Studies

including those of Conrad (1964) and Drewnowski and Murdock (1980) have also shown the salience of auditory features in short-term memory.

Like the above studies, the present study probably would have more strongly shown the significance of phonemic features in short-term memory if it had tested recall of the words seconds after their presentation. However, in this study, 24 words were presented over a 70 minute period after which recall of all the words was tested. The results suggest that the advantage of phonemic presentation diminishes an hour after initial presentation of new vocabulary when long-term memory begins to come into effect. The auditory aspects of words are probably most effective in aiding memory within seconds or a few minutes after their presentation. For example, the sounds of numbers would probably be helpful if one wanted to write down a telephone number immediately after hearing it on the radio.

Hypothesis 1B

The ESL students who learned new words through reading and writing and listening and pronunciation practice did not have significantly greater recall of the words two weeks after the lesson than those who learned the same words through silent reading and writing alone ($p < .05$). In fact, the average scores of the experimental and control groups were nearly identical for the Level 3 group.

These results do not appear to support Channell's (1988) speculation that associations which are both semantic and phonological would be the most helpful in aiding the future recall of new vocabulary. This study seems to indicate that listening and pronunciation practice does not improve long-term recall of words. Rather, it supports the notion of Craik and Lockhart (1972) that words are stored primarily in terms of their semantic features. It is also consistent with Underwood's claim that acoustic attributes of words are less important for their storage in memory when the meaningfulness of the words is great. In this study, the words were introduced and practiced in contextual exercises

which were highly meaningful; this could explain why there was no difference in recall scores between the experimental and control group. Knowledge of the phonology of the words did not seem to give the experimental group an added advantage.

However, several important factors must be taken into account when interpreting such results. This study involved only one treatment; in other words, the subjects had only one vocabulary lesson in which they practiced the new words. To really know new words and be able to use them, review over an extended period of time is necessary. For example, Crothers and Suppes, cited in Nation (1990), found that words had to appear six to seven times in a coursebook in order to be known by most of the learners. Nation (1990) suggests that an efficient beginning language coursebook should contain words that, on an average, are repeated 20 times throughout the book. In later years, he says textbooks with 10-12 repetitions of words might be enough.

Likewise, Oxford (1990) recommends that language learners do structured reviewing at carefully spaced intervals, at first close together and then more widely spaced apart. This technique called "spiraling" might, for example, involve reviewing 10 minutes after the initial learning, then 20 minutes later, an hour later, a day later, two days later, a week later, and so on.

The vocabulary lesson in this study, however, introduced the new words and repeated them eight times in two and a half minutes and then reviewed them only once in a cloze exercise during the last ten minutes of the 70 minute lesson. There was no further review of the words a day, a few days, or a week later. There is a possibility, then, that a time sequence experiment with structured review of the new words would have produced a greater difference in the recall of those who reviewed the words visually and auditorially as compared to those who reviewed the words through silent reading and writing only. This speculation invites empirical testing.

In addition, environmental conditions could have affected the results of the study. In this study it was impossible to completely isolate the experimental group from the control group in both environments: the language laboratory for the Level 3 study and the classroom for the ENL study. Therefore, the control group may have heard the experimental group pronouncing the new words aloud. This could have prompted them to do the same mentally, thus equalizing the results of both groups. The experiment needs to be repeated with tighter controls.

Hypothesis 2A

Students introduced to new words in both visual and auditory context did not have significantly greater comprehension of the words in written form immediately after the lesson than those students introduced to the same words in a visual context only ($p < .05$). The average comprehension scores of the experimental and control groups were nearly identical. Therefore, it appears that phonological instruction does not give language learners any advantage in understanding the words out of context in written form immediately after the lesson.

These results suggest that phonological recoding is not necessary to identify a written word's meaning. It appears that lexical access of a word can depend solely on its visual features. However, the words introduced in this study were not orthographically similar, as with the words "few" and "sew." Perhaps phonological instruction would only give a significant advantage in distinguishing words that look but do not sound similar.

Perhaps, too, phonological instruction only helps one to recognize a word encountered before but does not necessarily help one to remember the word's meaning. As mentioned previously, a time sequence experiment that reviews the words over an extended period of time would give more accurate results.

In addition, this experiment only tested whether pronunciation

practice helped subjects to recall and comprehend words in written form. It did not test whether pronunciation practice was beneficial for recalling words to use in conversation or in recognizing words in spoken form. It seems to be a stronger claim that phonological instruction will help spoken word recall and recognition.

Hypothesis 2B

Students who learned new words through reading and writing and listening and pronunciation practice did not have significantly greater comprehension of the words in written form two weeks after the lesson than those learning the same words through silent reading and writing alone ($p > .05$). Despite the lack of statistical significance, the experimental group had a very slight tendency to have higher scores on the second comprehension test than the control group. The average score for the experimental group was 10, while the mean score for the control group was 7.94.

As mentioned before, perhaps a repeated measures experiment that reviewed the words over a longer period of time would reveal an even greater advantage for the subjects who received phonological instruction as would an experiment with better isolation of the experimental groups. However, it appears from this experiment that phonological instruction in only one vocabulary lesson does not help students significantly in comprehending written words out of context. Knowledge of a word's visual and semantic properties seem to be adequate for understanding a word in written form. It could be that phonological instruction is necessary only for spoken word recognition. This hypothesis invites empirical testing.

Summary

Based on the results of the four main hypotheses, it appears that phonological instruction in vocabulary lessons does not give learners a significant advantage in recalling or comprehending the words in written

form immediately after the lesson or two weeks later. Stressing the visual and semantic components of words seems to be sufficient in teaching written word recall and comprehension.

There was, however, a tendency for the experimental group to have higher scores on the first recall test. Numerous past studies have shown the importance of auditory features in short-term memory of only a few minutes span. It could be that phonological instruction is helpful only for short-term recall of words, but after an hour or so, the advantage it provides decreases.

The slight tendency for the experimental group to have higher scores on the second comprehension test could be coincidence only. However, the importance of phonological instruction should not be totally discredited in written word recall and comprehension without further repeated measures studies which more closely resemble natural vocabulary learning and with better isolation of the experimental groups.

Furthermore, this study tested only written word recall and comprehension and did not test spoken word recall and comprehension. Perhaps teaching phonological properties of words would be more helpful in remembering words to use in speaking and for identifying and comprehending other's words in conversation. It could be that language learners can rely solely on visual features of words to learn them for reading and writing, but listening and speaking would be difficult if not impossible without phonological knowledge of words (eg. phonemes, stress, syllables).

DISCUSSION OF RESEARCH QUESTIONS 1-4: USE OF LEARNING STRATEGIES

Research Question 1: Use of Learning Strategy Groups

In a questionnaire, subjects revealed how often they used the groups of learning strategies described by Oxford (1990). Remembering strategies were the least commonly used of all the strategies; the

language learners said they used them "sometimes", almost seldom. Because these language learners had been in classes with American ESL teachers an average of six to seven months, this lack of emphasis on remembering strategies was probably a result of the teachers' preferences. In the past 10 years or so, rote memorization of vocabulary has fallen out of favor with ESL professionals, while guessing meaning from context has been stressed, especially in reading classes. In fact, the questionnaire results showed that the compensating for missing knowledge strategies were used by students between almost "usually" which was considerably more than the remembering strategies. Apparently, teachers are aware that rote learning does nothing to enable students to creatively use the language. However, their disdain of memorization could, in fact, be discouraging the students from using memory strategies that would benefit them in increasing their productive vocabulary.

The relatively high use of the learning from others strategies also seemed to be a reflection of teaching trends in the ESL profession. Subjects said they used these cooperative strategies between almost "usually". It is probable that today's emphasis on communicative learning is encouraging language learners to use other students and native speakers as resources rather than relying solely on their teachers.

The strategies for organizing and evaluating one's learning were similarly popular, used "usually". This could be a result of the type of ESL students involved in the study and their language goals. The students were learning English so they could pursue higher education degrees in American colleges or universities. Because they were taking English classes for academic purposes, they were very concerned about their grades and their progress toward the goal of getting accepted into a degree program. Therefore, they were constantly involved in organizing and evaluating their learning.

In contrast, subjects said they used strategies for managing their emotions and using all their mental processes only "sometimes". This could be a reflection of what ESL teachers in academic programs still need to improve on. Apparently, despite the fact that ESL teachers know they need to help students reduce their anxiety and take wise risks, the students are still not comfortable learning the language. It could be that it is extraordinarily difficult to reduce student anxiety in academic environments where high-stress tests such as the TOEFL are required for academic advancement. In addition, the low use ("sometimes") of strategies related to using all one's mental processes could be a result of programs that separate language learning into distinct classes according to the skills of reading, writing, grammar, listening, and speaking. Perhaps all the skills need to be combined in a language class so that students will use all of their mental processes flexibly and creatively.

Research Question 2: Use of Remembering Strategies

In Oxford's (1990) "Strategy Inventory for Language Learning", subjects were asked how often they used particular remembering strategies. Later, an informal interview of 12 of the participants was conducted to obtain more detailed description of the strategies used.

Subjects in the study used particular remembering strategies ranging from "seldom" to "sometimes". By far the most unpopular remembering strategy was using flashcards; subjects said they generally did not use this strategy. In the informal interview, only three of the 12 subjects said they used flashcards. These people said they wrote new words on cards and taped the cards in places in their homes where they would be sure to encounter them daily: on the wall or a bulletin board by their bed, the bathroom door near the doorknob, or the kitchen wall above the stove. One subject had a particularly interesting vocabulary learning technique that was taught to her by a teacher in Korea. Whenever she would encounter a word she did not know, she would look it

up in her dictionary and put a number beside it. When she got to number five, which meant she had looked up the word five times, she would decide that it was definitely time to memorize the word, so she would put it on a flashcard and tape the card on the wall.

It appeared from the informal interviews that the use of flashcards decreased when the students' vocabulary level increased. Two of the three flashcard users had low vocabulary levels according to Nation's (1990) "A Vocabulary Levels Test". Furthermore, two of the high-vocabulary level subjects interviewed said they had used flashcards when they were beginning to learn English, but as they advanced, they turned to other more contextual methods. All the students participating in the study were attending high-intermediate and advanced English classes. Perhaps flashcards are most useful for beginners.

In contrast, a mechanical technique that seemed popular with these more advanced students was keeping a vocabulary notebook; eight of the 12 subjects interviewed kept one. Use of vocabulary notebooks ranged from simply jotting down new words in no particular order to arranging the words in alphabetical order or by the readings where they were first encountered. One particularly diligent vocabulary learner swore by his method of noting the article, page, paragraph, and line where the word appeared. Whenever he wanted to review the new word, he would use his notes to refer him back to where he could see the word again in context.

The second least popular method of remembering vocabulary was physically acting out words. The 48 subjects said they used this method "sometimes", almost seldom. Most of the students interviewed said they used pantomime to make themselves understood, but only five of the 12 said they regularly used this method to help them remember words. This method seemed to be used by subjects with high and low vocabulary levels. For example, two said they had imaginary conversations with themselves, gesturing the words they were thinking of. A hand to the heart would mean "mine", for example. The other three said they would

usually associate a verb with an action and a situation such as "lifting" furniture or "pushing" a piano when helping a friend to move. A mother said she learned a lot of new words such as "hug" and "pat" by acting them out with her four-year old daughter. One student said acting out words helped him as a child learning his first language. Perhaps this is a vocabulary-learning strategy that adults should try to rekindle.

Another unpopular remembering strategy used "sometimes", almost seldom, by the 48 subjects was rhymes. In fact, none of the 12 students interviewed said they used rhymes; one, however, said he used to rhyme English words with funny, similar-sounding Chinese words when he was young. Just as with acting out words, rhyming seems to be a language learning strategy used more by children than adults. It is possible that adults see rhymes as childish, which is unfortunate because rhyming does seem to be an excellent remembering strategy. Our persistent memory of nursery rhymes and spelling rules such as "i before e except after c" is evidence of that.

Remembering the original location of a word was also not a common strategy, used only "sometimes" by the 48 subjects. Only three of the 12 students interviewed said they remember a word by thinking of where they first encountered that word, for example, in a cartoon or newspaper article. These students had high vocabulary levels. Perhaps, then, this strategy deserves more attention.

Similarly rated was the remembering strategy of making a mental picture of a situation in which to use the word. Four of those interviewed said they used this strategy, all interestingly enough women. Two said they would act out conversations using new words. The other two said they would create sentences with personal significance so they could use the sentences in future situations. For example, they both mentioned the word "marriage". They said they would think of sentences with the word such as "My marriage is very good for me," or

"My friends decided to get married." It appears that the personal significance of a word makes it much more memorable.

The four most popular remembering strategies, though by no means well-used, were reviewing, connecting the sound of a word to an image of the word, using words in a sentence, and thinking of relationships between background knowledge and new words.

Reviewing was used "sometimes" by the subjects. Eight of the 12 students interviewed reviewed new vocabulary, but to varying degrees. One subject with a relatively high vocabulary level, in fact, said he would try to guess a word's meaning while reading, and then let the new word "disappear." If he encountered the word a second time, he would try to visualize its meaning. Only on the third encounter would he look up the word in a dictionary. At this time he claimed he would remember the word and not need to review it. Most students, however, probably do not have a keen enough memory to use this technique. The students that reviewed said they did so anywhere from two to three times the night before a vocabulary test to everyday. Four said they reviewed words only for tests; four said they reviewed words for the sake of learning them. One interesting reviewing technique was to look back at new words once a week and scratch out those that were learned. Another useful reviewing technique was to group words by topic according to the article in which they were encountered, and later look back at them as words to use in class essays. This method emphasizes the value of content courses in which students can read, talk, and write about the same topic, thus recycling newly-learned vocabulary.

Another more commonly used remembering strategy, though it too was used only "sometimes", was connecting the sound of a word to an image of the word. However, the 8 students interviewed who used this technique tended to stress the visual aspects of words over the auditory aspects; all but one were unfamiliar with the keyword technique and had never used any method like it. (See page 26 for a description of the keyword

technique.) The one student who used a variation of the technique described how she would remember the word "oversee" by picturing an arrow pointing down over the waves of a "sea". The others interviewed, however, made no reference to using sound in their visual pictures of words. Several said they would visualize where they first encountered a new word and the photograph or drawing that accompanied the word. Others would see pictures from the news or from personal experiences to remember a word. For example, one student would picture clean air when she thought of the word "pure." Another would remember unusual pictures such as an elephant's trunk to remember the word "nozzle". These students' remembering techniques tended to support two theories: 1) memory of new words is aided by relating the words to personal background knowledge; and 2) as one student described it, "the more unusual the memory, the better." This explains the success of using nonsense sentences such as "Neither weird foreign financier seized their height at leisure" to remember spelling rules (or in this case exceptions to the rules), words in a list, categories, and so on.

Relating new words in information already in your memory was one of the most popular remembering technique; however, subjects said they used this method "sometimes", almost "usually". Eleven of the 12 students interviewed said they used this method but to varying degrees. As mentioned in the previous paragraph, some students would relate new words to familiar visual images. Others would also relate new words to familiar knowledge (e.g. thinking of how the Japanese colonized Korea to remember the word "colony") or to personal experiences (e.g. thinking of one's husband to remember the word "marriage"). Three of those interviewed said they used their background knowledge of word affixes and roots to identify and remember words.

The other most popular memory technique was using new words in a sentence. The 48 subjects said they used this method "sometimes". Eight of the 12 subjects said they tried to use new words in

conversation, essay writing, or in mentally created sentences. Those who tried to use new words in conversation would imitate others' words in conversation, test the reactions of others to their use of new words, or ask for reinforcement or correction by saying, "I think you call it _____."

The results of the interview closely followed the results of the questionnaire. In both the questionnaire and the interview, the five least popular remembering techniques were: using rhymes, using flashcards, remembering the original location of words, making a mental picture of a situation to use the word in, and physically acting out words. The most popular memory techniques were using visual images, reviewing, using words in a sentence, and thinking of relationships between known things and new words. It was found from the interview that the majority of students also created vocabulary notebooks to remember words. Figure 7 summarizes how many of the 12 subjects interviewed used each particular remembering strategy.

Research Question 3: Use of Vocabulary-Related Mental Process Strategies

In the "Strategy Inventory for Language Learning", subjects were asked to rate how often they used cognitive strategies that would help them with vocabulary learning. The 12 subjects interviewed were also asked if they used these particular learning strategies.

The practicing strategy of using words in different ways in natural situations was the least commonly used; the 48 subjects said they used this strategy slightly "sometimes", almost seldom. Of the 12 subjects interviewed, six said they practiced new words in both written and spoken context. These six said they tried to use new words in their essays and in conversations with friends. However, a couple of others expressed fear of making embarrassing mistakes by using the wrong word in conversation, so they said they avoided speaking practice until they had confidence with the new word.

Figure 7. How many subjects interviewed use particular remembering strategies.

Another unpopular vocabulary-learning strategy was reading English for pleasure. The 48 subjects who answered the questionnaire said they used this strategy only "sometimes". Likewise, only half (6) of the 12 students interviewed said they read for pleasure and most of these said they read only newspapers and magazines. Only one student mentioned reading English novels. However, the students who did read for pleasure said this was the primary way they learned new vocabulary.

Slightly more popular were three strategies that subjects said they still used only "sometimes": finding patterns in words, practicing English sounds, and finding the meaning of words by dividing them into parts. The 12 subjects interviewed were not asked specifically whether they memorized language formulas and patterns in order to later be able to analyze and learn the component words. However, they were asked whether they practiced English sounds and analyzed word parts.

Eight of the 12 interviewed said they practiced the sounds of words to help them remember the words. The majority of these said word stress was the most important phonological aspect in learning a word, and syllable division was the second most important. Only one student with a low vocabulary level said spelling was important in learning a word. In fact, one more advanced student said that when she was beginning to learn English, spelling was very important to her, but later she found that accent was more crucial. It could be that when English learners are just beginning to study the language, they rely heavily on spelling and individual phonemes of words, but as they become more advanced they realize that word stress and syllable division is even more important in being able to remember, comprehend, and produce English. Indeed, it is much easier for native speakers to understand a foreign speaker who substitutes one phoneme for another (e.g. "tank you" for "thank you") than it is for them to understand a word with misplaced primary stress (e.g.- "sesame" instead of "sesame").

Seven of the 12 students interviewed said they found the meaning of

new words by dividing the words into parts-- prefixes, suffixes, and roots. These seven said that when they learned a new word, they would also learn the different forms of the word as in "associate, association, disassociate, disassociation." It is surprising that with all the emphasis that academic ESL programs put on using affixes to learn new words that students did not use this strategy more often. It could be that because this strategy is only useful with words of Latin not German origin, students do not rely heavily on this method.

The two most popular cognitive methods for learning vocabulary were saying or writing new words several times and looking for similar words in one's native language. These strategies were used "usually". The 12 students interviewed were not asked specifically if they looked for cognates when learning English vocabulary, but it is probable that the majority used this technique. Those interviewed were asked if they repeated a word in speaking or writing to remember it. Eleven of the 12 interviewed said they used this strategy, repeating a new word anywhere from two to 12 times. Two said they would repeat a word to themselves, while two others said they would repeat the word aloud because "sound is more important than spelling." On the other hand, five students said they wrote the word several times to remember it because the visual aspects of words were more memorable to them. Four also said they repeated reading a word in context to remember it. It appears, then, that students vary widely in how they repeat new words to remember them.

In summary, the interviews supported the questionnaire results for Research Question 3; the least popular cognitive strategies for learning vocabulary were using new words in different ways in natural contexts and reading for pleasure. The strategies that were of medium popularity were practicing the sounds of English and finding the meaning of words by dividing them into parts. The most popular strategy was repeating new words several times. Figure 8 illustrates these results.

Figure 8. How many subjects interviewed use particular mental process strategies related to vocabulary learning.

Because the subjects were not interviewed about using patterns and cognates, these strategies were estimated.

Research Question 4: Use of All Vocabulary Learning Strategies

A comparison was made of how often the 48 subjects used particular groups of learning strategies related to vocabulary learning. It was found that remembering strategies were by far the most unpopular of the vocabulary-related strategies. Cognitive, or using all your mental processes, strategies were much more popular in dealing with new vocabulary. However, guessing a word's meaning from context, a compensating for missing knowledge strategy, seemed to be the most popular vocabulary strategy of all.

As illustrated in Figure 9, the interviews of 12 subjects in the study tended to confirm these results. As with the questionnaire results, most of the remembering strategies were unpopular except for using new words in sentences, reviewing, and thinking of relationships between one's background knowledge and new words. Cognitive strategies tended to be more popular than remembering strategies with the exception of reading for pleasure and using new words in different ways. The most popular cognitive strategy was repeating new words in speaking and/or writing. The major difference between the questionnaire and interview results was that guessing a word's meaning from context did not prove to be as well-used by those interviewed as was revealed by all the subjects in the questionnaire. Perhaps the subjects overestimated how often they personally use this strategy because it is a strategy that teachers seem to emphasize in ESL reading classes.

Summary

Because vocabulary strategies are often learned in class, the results could be interpreted as an indication of what aspects of vocabulary learning that certain academic ESL programs in the United States emphasize. It appears that remembering strategies are relatively

Figure 9. A comparison of how many subjects interviewed use vocabulary learning strategies under the categories of remembering more effectively, using all one's mental processes, and compensating for missing knowledge.

neglected in ESL vocabulary teaching and learning, at least in the academic ESL programs examined in this study. With the emphasis placed recently on communicative and contextual learning, it seems that teachers are avoiding anything remotely linked to rote memorization. Therefore, useful memory techniques such as imagery, rhyming, and acting out words seem to be neglected. Even though mnemonic devices have been used successfully for thousands of years, these seem to now be out of fashion.

More popular ways of teaching and learning vocabulary are cognitive strategies in which students manipulate or transform the target language. The cognitive strategies that students most often use to learn vocabulary are what Oxford (1990) calls cognitive practicing strategies such as repeating, practicing the sounds and writing of words, and trying to use the new vocabulary in natural, realistic settings. Oxford (1990) emphasizes how essential practice is to learning a language, and the academic ESL students in this study seem to recognize this.

Another popular set of cognitive strategies for vocabulary learning is to analyze and "reason out" new words by recognizing word patterns, breaking down words into parts, and comparing new vocabulary to one's own native language. Oxford (1990) says analyzing language and creating general rules is an extremely valuable way that adults learn a new language. However, she cautions that overuse of these strategies can lead to students making mistakes by unquestioningly generalizing rules they have learned or transferring expressions from their native tongue to English.

Finally, the compensation strategy of guessing words' meanings from context seems to be as popular as cognitive strategies. Guessing from context is a compensation strategy that helps students to continue on with listening or reading even when they have an inadequate repertoire of vocabulary. This strategy of using linguistic and nonlinguistic

clues to make inferences about a word's meaning has been heavily emphasized in ESL reading classes in the last decade.

In summary, the vocabulary strategies that are used most by students are those strategies that help them to understand and practice words, but not necessarily those that help them to remember the words.

RESEARCH QUESTIONS 5-8: CORRELATIONS

Research Question 5: Correlations Between Use of Strategy Groups and Test Scores

This question asked if there were any correlations between overall use of remembering strategies or mental process (cognitive) strategies and scores on the vocabulary recall and comprehension tests. No significant correlation was found between subjects' use of remembering strategies and their scores on both of the vocabulary tests. In addition, there was no significant correlation found between mental process strategies and scores on the comprehension test. On the other hand, there was a significant positive relationship between mental process strategies and recall test scores.

These results could lead to several possible conclusions. The least likely conclusion is that using remembering strategies does not help one to later comprehend or recall newly-introduced vocabulary. This seems to contradict common sense. A more likely possibility is that no correlation was found because students were not asked to use Oxford's (1990) remembering strategies in the experimental vocabulary lesson. In other words, the majority of the remembering strategies listed in Oxford's questionnaire (imagery, rhymes, acting out words, using flashcards, etc.) were not employed by the students in the vocabulary lesson. The only remembering strategy directly encouraged was practicing new words in a sentence. Perhaps the students also related words to their background knowledge, but for the most part, the types of remembering strategies described by Oxford were not used. Nor were the students asked to further study words on their own, so they had

no opportunity to employ individual remembering strategies. Probably for this reason, no relationship was found between remembering strategies and test scores.

To more accurately determine whether remembering strategies aid vocabulary recall and comprehension, subjects could be given words to learn on their own in a controlled environment. They could then proceed to use individual remembering strategies to memorize the words. Afterwards, the correlation between the number of memory strategies employed and scores on the vocabulary tests could be computed. In addition, specific memory strategies used by the subjects could be correlated with degree of success on the vocabulary tests.

In contrast to remembering strategies, there was a stronger correlation between use of mental process strategies and vocabulary test scores. In fact, the positive correlation between mental process strategies and recall test scores was significant, probably because the experimental vocabulary lesson actually did ask students to use cognitive practice strategies: formally practicing the sounds (pronunciation and intonation) and spelling of the new words, practicing the words naturalistically in different ways (reading, writing the words in sentences, listening to the words in passages, saying the words aloud), repeating the words, and recombining the words in different types of sentences such as questions and statements. Perhaps the positive correlation showed that those students who usually spent more time cognitively practicing new vocabulary were probably those students who took the vocabulary lesson more seriously, thus taking advantage of the ample practice opportunities. The significant positive correlation points to the importance of naturalistic and varied practice in learning vocabulary.

It is a possibility that cognitive practice is more important in vocabulary recall than in comprehension because no significant correlation was found between mental process strategies and

comprehension test scores. Perhaps naturalistic practice is not as crucial in comprehension as it is in production of new words. In the study, subjects' comprehension was four times better than their recall immediately after the lesson. Two weeks later, their recall had dropped dramatically and their comprehension was eight times better than their recall. Recognizing words is much easier than producing them; perhaps this is why practicing did not seem as significantly related to word comprehension as it did to production.

Research Question 6: Correlations Between Remembering Strategies and Test Scores

It was determined whether there were any significant correlations between subjects' use of specific remembering strategies and their scores on the vocabulary tests. The specific remembering strategies were using new words in sentences; using sounds and images; using mental pictures of situations in which to use new words; using rhymes; and remembering the original location of words. As was to be expected from the results of Research Question 5, there were no significant correlations except in one case. A significant negative relationship was found between the comprehension test scores and the strategy of remembering the original location of a new word. It seems unlikely that remembering the location of a word would hinder a person's memory of that word; the negative correlation was probably just a chance occurrence.

Again, it is probable that no correlations were found because the vocabulary lesson did not emphasize Oxford's (1990) remembering strategies; furthermore, students were not encouraged to use their own memory techniques. Therefore, it is not surprising that no positive correlations were found. The experiment should be redesigned to more specifically teach and test these strategies if this is the major goal.

Research Question 7: Correlations Between Vocabulary-Related Mental Process Strategies and Test Scores

Correlations were computed between the vocabulary tests and use of the following mental process strategies: saying or writing new words several times, practicing the sounds of English, using new words in different ways, reading for pleasure, and finding the meaning of words by examining their parts. In contrast to remembering strategies, several significant positive correlations were discovered. A significant positive relationship was found between the recall test scores and use of the cognitive strategies of practicing the sounds of English, using new words in different ways, and reading for pleasure. Likewise, the positive correlation was significant between the comprehension test scores and use of the strategies of practicing the sounds of English and using new words in different ways.

The positive correlation between pronunciation practice and high scores on the recall and comprehension tests seems to support this study's main hypothesis--that practicing the sounds of words will aid memory of these words. The hypothesis may have been unsubstantiated in the primary study because it was difficult, maybe even impossible, to prevent subjects from using the individual strategy of sounding-out words. In other words, perhaps subjects in the control group practiced pronunciation of the words despite the fact that there were no instructions given to do so. Because of the inability to completely isolate the experimental group from the control group, it is possible that the control group overheard the experimental group pronouncing words and therefore, imitated them. It is also probable that certain students always use the pronunciation strategy. Therefore, the positive correlation between practicing the sounds of English and high scores on the vocabulary tests could actually support of the main hypothesis. Perhaps because it is extremely difficult to isolate those who use the sounding-out strategy from those who do not, a correlation experiment is more accurate. A correlation experiment where students use their own

individual vocabulary learning strategies could be more fruitful.

Practicing using new words in different ways seemed to be strongly related to success on the comprehension and recall tests. Indeed, the experimental vocabulary lesson did ask students to practice using the new vocabulary in different ways by reading the words in passages, writing the words in sentences, and in the case of the experimental group, listening to the words and pronouncing them. Those who said they practiced words naturalistically in different ways were probably those who took advantage of the varied practice opportunities in the vocabulary lesson. Therefore, they had higher vocabulary scores. Naturalistic and varied practice of words seems to ensure better comprehension and memory of these words.

The significant positive relationship between reading for pleasure and success on the recall test seems to point to the importance of reading for increasing productive vocabulary. It could be that those who read English for pleasure were better able to understand the reading passages in the vocabulary lesson because they had had more experience in reading. These students may have had higher vocabulary recall scores because the reading passages helped them to understand new words rather than confused them by introducing too many other new words at the same time. Those students who had greater success with the vocabulary lesson were probably those who had a higher vocabulary level because of substantial reading.

Research Question 8: Correlation Between the Guessing from Context Strategy and Test Scores

A significant positive relationship was discovered between the strategy of guessing words and high scores on the vocabulary recall test. This is really not surprising. The vocabulary recall test encouraged subjects to identify any memory trace they had of the newly-introduced words: number of syllables, primary stress, and beginning, middle and ending letters. Correct guessing was rewarded with points,

while incorrect guessing was not penalized. Therefore, those who were more willing to guess had higher word recall scores. Guessing is a way to compensate for missing knowledge, a way to overcome language limitations. Oxford (1990) says guessing can lead to more success in understanding and communication, and these results seem to support that.

A FINAL ANALYSIS OF WHAT STRATEGIES MAY LEAD TO SUCCESS IN VOCABULARY LEARNING

In interviews, 12 subjects were asked what steps they went through to learn a word for recognition and production. An informal attempt was then made to determine which strategies seemed to be related to high and low vocabulary levels. The following discussion is not based on formal statistics, but rather on intuitive observations of patterns that seemed to emerge.

The majority of the six students with higher vocabulary levels as determined by Nation's (1990) "A Vocabulary Levels Tests" reported that they read outside of class to increase their comprehension of new words. Most said they read the newspaper daily and one reported reading English novels for pleasure. In addition, all of the high vocabulary level students said they would first skim an article to get the general meaning and then go back and try to guess unknown words from contextual clues. One, in fact, reported that in trying to discover a word's meaning, he would substitute synonyms that made sense. All of the high level students said they would use a dictionary only to check their guess or as a last resort if guessing failed. These were the basic steps they followed if they wanted to learn a word for recognition only.

On the other hand, the majority of the subjects with lower vocabulary levels said they did not read much English outside of class. In addition, only one said he tried to guess words from context. The remainder said they would immediately look the word up in their dictionary, either an English-English dictionary or a translation dictionary. Two said they learned words from conversations with their

host family and would ask what the words meant. It appears, then, that a high vocabulary recognition level is related to extensive outside reading and guessing words from context rather than immediately looking up an unknown word or asking a native speaker for its meaning.

When the 12 subjects were asked what they usually did to learn a word for production, the strategies were much more varied. Most of the students with higher vocabulary levels reported reading extensively and looking for the new word again in different contexts. One, in fact, said he did not believe in memorizing. Instead he would learn the word automatically after encountering it three times in the newspaper and on the radio. Many of the others, however, said they highlighted the new words in the readings and then wrote the words on a piece of paper or in a vocabulary notebook. In addition, all the students with high vocabulary levels mentioned extensive reviewing over many weeks. Aside from those strategies, the students used many different techniques.

One student with a particularly high vocabulary level said he would look for a new word's part of speech and find other forms of the word. Then he would pronounce the word mentally, write the word, and memorize the context in which the word appeared (e.g. the sentence). Another student would put a number beside the word in her dictionary every time she had to look it up. When she reached number five, which meant she had looked up the word five times, she would write the new word on a flashcard and in a vocabulary notebook. Afterwards, she would review the new word three times a week until she knew it. Another said he arranged a vocabulary notebook according to where he first met the word: article title, page number, paragraph, and line. Then he would review every week and try to use the new words in his essays. One other high level student reported using a vocabulary workbook with extensive and varied exercises such as finding antonyms, answering multiple choice questions, matching words to definitions, writing sentences, and filling in cloze exercises. This student said she would write the new words in

her notebook and scratch them out when she had learned them.

In contrast, the students with lower vocabulary levels did not report such well-defined and extensive techniques for learning words for production. Most reported repeating the new word aloud or in writing to memorize it. Several also mentioned that they tried to remember where they had first encountered the word when they needed the word again. Only one mentioned reviewing; the others said they either seldom used the word again or asked for help from a native speaker when they needed the word again.

The following tentative conclusion can be made: Those students with high vocabulary levels have extensive step-by-step procedures that they go through to learn a word for production. These strategies vary greatly from learner to learner but seem to always involve practicing the new words in context, especially in reading, and reviewing extensively. Students who are not as successful in gaining a active productive vocabulary tend not to have developed contextual practice and reviewing strategies. They seem to rely mostly on repeating the word out of context to remember it.

RECOMMENDATIONS FOR FURTHER RESEARCH

It is recommended that the primary part of this study on the effect of phonological instruction be replicated with the following improvements:

- a) Use a larger sample of subjects (at least 30 in each group).
- b) Have a longer experimental time with repeated treatments because review is a necessary component of vocabulary learning. For example, use a spiraling approach where words are reviewed a few minutes after introduction, and then a day, a week, and finally, severally weeks later.
- c) Assign subjects to the experimental or control group based on whether or not they naturally "sound out" words when

they are learning them. Discover this information through a questionnaire in which various vocabulary learning strategies are mentioned.

- d) Completely isolate the groups so that the control group does not hear the experimental group pronouncing the new words.
- e) Test whether pronunciation practice makes a difference in recognizing and recalling words that are orthographically similar as in "loin" and "lion".
- f) Test not only written recall and comprehension of words, but also spoken word recall and comprehension. Phonological instruction in new vocabulary could have a greater impact on listening and speaking than on reading and writing.

In addition, it is recommended that more descriptive research be done on individual learning strategies in order to obtain information on what strategies are associated with successful vocabulary learning. Learning strategies have just recently become a topic of great interest, so there are many possibilities. The following list serves as suggestions:

- a) Conduct more extensive interviews and/or distribute questionnaires to a greater number of language learners (at least 100) to identify individual vocabulary-learning strategies.
- b) After identifying individual learning strategies, formally correlate strategies with vocabulary level, controlling for amount of exposure to English.
- c) Conduct an experiment in which subjects are given new vocabulary to learn on their own in a controlled amount of time. Later, give the subjects vocabulary recall and comprehension tests and interview them on what specific strategies they used to learn the words. Afterwards, formally correlate individual learning strategies with

vocabulary test scores to discover what strategies were most likely to lead to successful remembering.

IMPLICATIONS FOR TEACHING VOCABULARY

The results of this research and my experience as a language learner and teacher suggest that students are not taking full advantage of the individual learning strategies that would help them to build their vocabularies. Because language instructors cannot possibly teach learners all the words they need to successfully communicate in a second language, a possible alternative would be to teach students strategies for understanding and remembering new vocabulary on their own.

Oxford (1990) says that memory strategies are important for helping learners to store in memory the important things they hear or read in the new language, thus enlarging their knowledge of the language. These strategies also help learners to retrieve from memory information to be used for comprehension and production. The mind is able to store trillions of pieces of information, says Oxford, but its full potential cannot be realized unless memory strategies are used. This study has shown, however, that remembering strategies are extremely underused by ESL students. Therefore, instructors would benefit their students tremendously if they directly taught remembering strategies that Oxford (1990) categorizes as: 1) creating mental linkages (grouping, associating, placing new words into a context); 2) applying images and sounds (using imagery, semantic mapping, using keywords, representing sounds in memory); 3) structured reviewing; and 4) employing action (using physical response or sensation and mechanical techniques). (p. 40-43).

Although this study had mixed results, it does seem that phonological practice is one useful strategy in remembering new vocabulary. It may not be as useful in written recall and comprehension as in spoken recall and comprehension, but it is a memory strategy that

deserves more attention in the classroom. In speaking and listening, ESL students would particularly benefit from practice with word stress and syllable division because English is a language that relies heavily on accent and intonation to distinguish words.

This research appears to support Underwood's (1969) claim that acoustic attributes of words become less important when the meaningfulness of the words is great. It could be that learning the sounds of words is just the first step in the process of learning vocabulary. In introducing new words, it could be best for language instructors to first introduce the sounds through selective listening, aural discrimination, songs, and rhymes. Later, meanings could be practiced with semantic field and collocation exercises, sentence writing, synonym and antonym games, reading, and so on.

The cognitive strategy of practicing is especially relevant to vocabulary learning and should be emphasized more by ESL instructors. Although ESL students said they used these strategies more than remembering strategies, they still used them only between "sometimes" and "usually." Because language learning requires thousands of hours of practice that cannot be met by the limited amount of class time available, teachers should assign homework that requires vocabulary practice and teach students cognitive strategies that they can use to practice further on their own. Oxford (1990) stresses the importance of practice and lists practicing strategies that are relevant to vocabulary learning: 1) repeating; 2) formally practicing with sounds and writing systems; 3) recognizing and using formulas and patterns; 4) recombining language structures; and 5) practicing naturalistically. Practice may not make perfect, but it certainly will help one to become more fluent.

Finally, because it is impossible for students to memorize the thousands of words in the English language, the strategy of guessing meaning from context becomes particularly useful. Oxford (1990), in fact, says that compensating strategies may be among the most important

for beginning and intermediate language learners. The recent trend in teaching students how to guess words from linguistic and nonlinguistic clues should continue and be expanded.

In conclusion, the variety of learning strategies used by students in this study seems to illustrate that strategies are an individual thing; what works for one may not work for another. Therefore, it is the teacher's responsibility to expose students to a wide variety of strategies so the students can choose the ones that benefit them the most. The more versatility learners have in their repertoire of learning strategies, the more fluent they will probably become.

As Oxford (1990) points out, no one knows everything about how people learn languages, so we must all share what we do know. Furthermore, language learning is not something that can be spoon-fed; it requires what Oxford calls "active self-direction on the part of learners" (p. 201). Therefore, it seems to be the language teacher's responsibility to facilitate the process of showing learners how to learn.

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APPENDIX A

A VOCABULARY LEVELS TEST

Name _____

Telephone _____

Nationality _____

Native Language(s) _____

Gender _____

A Vocabulary Levels Test

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning. Here is an example.

1. business
2. clock   _____ part of a house
3. horse   _____ animal with four legs
4. pencil   _____ something used for writing
5. shoe
6. wall

You answer it the following way.

1. business
2. clock   6   part of a house

A VOCABULARY LEVELS TEST

3. horse   3   animal with four legs
 4. pencil   4   something used for writing
 5. shoe
 6. wall

Some words are in the test to make it more difficult. You do not have to find a meaning for those words. In the example above, these words are *business, clock, shoe*.

Try to do every part of the test.

The 2,000-word level

1. original
 2. private   _____ complete
 3. royal   _____ first
 4. slow   _____ not public
 5. sorry
 6. total

1. apply
 2. elect   _____ choose by voting
 3. jump   _____ become like water
 4. manufacture _____ make
 5. melt
 6. threaten

1. blame
 2. hide   _____ keep away from sight
 3. hit   _____ have a bad effect on something
 4. invite   _____ ask

TEACHING AND LEARNING VOCABULARY

5. pour

6. spoil

1. accident

2. choice _____ having a high opinion of yourself

3. debt _____ something you must pay

4. fortune _____ loud, deep sound

5. pride

6. roar

1. basket

2. crop _____ money paid regularly for doing a job

3. flesh _____ heat

4. salary _____ meat

5. temperature

6. thread

1. birth

2. dust _____ being born

3. operation _____ game

4. row _____ winning

5. sport

6. victory

The 3,000-word level

1. administration

2. angel _____ managing business and affairs

3. front _____ spirit who serves God

A VOCABULARY LEVELS TEST

4. herd   _____ group of animals
5. mate
6. pond

1. bench _____
2. charity _____ part of a country
3. fort _____ help to the poor
4. jar _____ long seat
5. mirror _____
6. province _____

1. coach _____
2. darling _____ a thin, flat piece cut from something
3. echo _____ person who is loved very much
4. interior _____ sound reflected back to you
5. opera _____
6. slice _____

1. marble _____
2. palm _____ inner surface of your hand
3. ridge _____ excited feeling
4. scheme _____ plan
5. statue _____
6. thrill _____

1. discharge
2. encounter _____ use pictures or examples to show the meaning
3. illustrate
4. knit _____ meet

TEACHING AND LEARNING VOCABULARY

5. prevail   _____ throw up into air
 6. toss
1. annual
 2. blank   _____ happening once a year
 3. brilliant   _____ certain
 4. concealed   _____ wild
 5. definite
 6. savage

The 5,000-word level

1. alcohol
 2. apron   _____ cloth worn in front to protect your clothes
 3. lure   _____
 4. mess   _____ stage of development
 5. phase   _____ state of untidiness or dirtiness
 6. plank
1. circus
 2. jungle   _____ speech given by a priest in a church
 3. nomination   _____ seat without a back or arms
 4. sermon   _____ musical instrument
 5. stool
 6. trumpet
1. apparatus
 2. compliment   _____ set of instruments or machinery
 3. revenue   _____ money received by the government
 4. scrap   _____ expression of admiration

A VOCABULARY LEVELS TEST

5. tile

6. ward

1. bruise

2. exile   _____ agreement using property as security
for a debt

3. ledge   _____ narrow shelf

4. mortgage   _____

5. shovel   _____ dark place on your body caused by
hitting

6. switch

1. blend

2. devise   _____ hold tightly in your arms

3. embroider   _____ plan or invent

4. hug   _____ mix

5. imply

6. paste

1. desolate

2. fragrant   _____ good for your health

3. gloomy   _____ sweet-smelling

4. profound   _____ dark or sad

5. radical

6. wholesome

The University Word List level

1. affluence

2. axis   _____ introduction of a new thing

3. episode   _____ one event in a series

TEACHING AND LEARNING VOCABULARY

4. innovation   _____ wealth
  5. precision
  6. tissue
-
1. deficiency
  2. magnitude   _____ swinging from side to side
  3. oscillation   _____ respect
  4. prestige   _____ lack
  5. sanction
  6. specification
-
1. configuration
  2. discourse   _____ shape
  3. hypothesis   _____ speech
  4. intersection   _____ theory
  5. partisan
  6. propensity
-
1. anonymous
  2. indigenous   _____ without the writer's name
  3. maternal   _____ least possible amount
  4. minimum   _____ native
  5. nutrient
  6. modification
-
1. elementary
  2. negative   _____ of the beginning stage
  3. static   _____ not moving or changing
  4. random   _____ final, furthest
  5. reluctant
  6. ultimate

A VOCABULARY LEVELS TEST

1. coincide
2. coordinate   _____ prevent people from doing something they want to do
3. expel
4. frustrate   _____ add to
5. supplement   _____ send out by force
6. transfer

The 10,000-word level

1. acquiesce
2. contaminate   _____ work at something without serious intentions
3. crease
4. dabble   _____ accept without protest
5. rape   _____ make a fold on cloth or paper
6. squint

1. blaspheme
2. endorse   _____ give care and food to
3. nurture   _____ speak badly about God
4. overhaul   _____ slip or slide
5. skid
6. straggle

1. auxiliary
2. candid   _____ full of self-importance
3. dubious   _____ helping, adding support
4. morose   _____ bad-tempered
5. pompous
6. temporal

TEACHING AND LEARNING VOCABULARY

1. anterior
  2. concave   _____   small and weak
  3. interminable   _____   easily changing
  4. puny   _____   endless
  5. volatile
  6. wicker

  1. dregs
  2. flurry   _____   worst and most useless parts of anything
  3. hostage
  4. jumble   _____   natural liquid present in the mouth
  5. saliva   _____   confused mixture
  6. truce

  1. auspices
  2. casualty   _____   being away from other people
  3. froth   _____   someone killed or injured
  4. haunch   _____   noisy and happy celebration
  5. revelry
  6. seclusion
-

APPENDIX B

VOCABULARY CHECKLIST

NAME _____ NATIONALITY _____
 TELEPHONE _____ NATIVE LANGUAGE(S) _____
 GENDER _____

VOCABULARY CHECKLIST

Directions: Please put a check mark beside every word that you think you know.

___ access	___ auspices	___ criterion
___ accumulate	___ averse	___ crucial
___ acid	___ battery	___ currency
___ adhere	___ breed	___ cylinder
___ aggregate	___ bulk	___ decimal
___ aggression	___ cater	___ deflect
___ align	___ circuit	___ deliberate
___ allude	___ circulate	___ denote
___ ally	___ cogent	___ detect
___ ambiguity	___ coincide	___ diameter
___ angular	___ column	___ discern
___ anomaly	___ compel	___ dispense
___ anonymous	___ complement	___ displace
___ apparatus	___ comprise	___ distort
___ append	___ compulsion	___ diverge
___ appendix	___ condense	___ drastic
___ arbitrary	___ confine	___ elicit
___ ascribe	___ coincide	___ eloquent
___ aspiration	___ consent	___ emancipate
___ assent	___ correlate	___ embrace
___ assimilate	___ converge	___ emerge

___ affiliate	___ colloquial	___ embody
___ enhance	___ margin	___ repress
___ episode	___ maternal	___ reverberate
___ equidistant	___ matrix	___ revolve
___ equilibrium	___ metaphor	___ rigor
___ evaporate	___ moist	___ rural
___ evoke	___ molecule	___ saturate
___ evolve	___ momentum	___ shrink
___ exponent	___ monarch	___ skeleton
___ facilitate	___ myth	___ spatial
___ faction	___ null	___ stationary
___ fate	___ option	___ subordinate
___ finite	___ oscillate	___ supreme
___ fluctuate	___ outcome	___ surplus
___ fraternal	___ partisan	___ switch
___ fulfill	___ perpetual	___ tangible
___ fundamental	___ pertinent	___ telescope
___ illuminate	___ pervade	___ transparent
___ implicit	___ pest	___ transport
___ impulse	___ postulate	___ trend
___ inconsistent	___ premise	___ undertake
___ index	___ priority	___ unduly
___ ingenious	___ proclaim	___ utilize
___ inherent	___ procure	___ utter
___ integer	___ prohibit	___ vague
___ interrelate	___ provoke	___ vein
___ irrigate	___ purport	___ velocity

___ intuitive	___ ratio	___ vibrate
___ leisure	___ recur	___ violate
___ legislate	___ reluctant	___ vital
___ locomotion	___ render	___ voluntary
___ affluence	___ amorphous	___ asset
___ awe	___ collapse	___ collide
___ commodity	___ concentric	___ confer
___ configuration	___ console	___ construe
___ contingent	___ cumbersome	___ defer
___ degenerate	___ degrade	___ detriment
___ enumerate	___ fuse	___ incentive
___ incessant	___ indigenous	___ inverse
___ invoke	___ metabolism	___ morphology
___ pendulum	___ pragmatic	___ propagate
___ propensity	___ prudence	___ spectrum
___ transact	___ upsurge	___ volt

APPENDIX C

VOCABULARY LESSON

Name _____

Native Language _____

Nationality _____

Gender _____

VOCABULARY EXPERIMENT

Directions: Read the following passages one at a time. Each passage will introduce you to a new vocabulary word. After reading a passage, write two short sentences using the new word. In the first sentence you will rephrase a sentence using the new word, and in the second sentence you will answer a question using the new word and an original answer. Example answers follow the exercise. YOU WILL BE WORKING UNDER A TIME LIMIT. PLEASE LISTEN TO THE TAPE AND WHEN IT SAYS SO, MOVE ON TO THE NEW WORD. DO NOT WORRY IF YOU HAVE NOT FINISHED A SECTION.

WORD #1: fluctuate

When a population f_____, it rises and falls in an irregular way. The immigrant population f_____; last year it declined, but this year it appears to be rising again. When production f_____, its movement will not be represented by a smooth curve but a series of rising and falling waves. Between 1849 and 1949, coal and iron production in France f_____ed because of the unpredictability of the economy and consumer demand.

fluctuate -- (verb) to rise and fall; change from one state to another

- a. Rewrite this sentence using fluctuate:
The price of vegetables rises and falls according to the season.
- b. Answer this question using fluctuate and your own words:
What fluctuates when you exercise?

Sample Answers:

- a. The price of vegetables fluctuates according to the season.
- b. Your heartbeat fluctuates when you exercise.

Word #2: cumbersome

When a package is c_____, it is too heavy and awkward to carry. The grocery bags were so c_____e that the woman needed help taking them to her car. Jeanne felt uncomfortable in the c_____e long dress she had to wear to the prom. The moving company didn't know how they would get the c_____e grand piano out through the front door.

cumbersome (adjective) heavy and awkward to carry, wear, etc.

- a. Rewrite this sentence using cumbersome:
During the bitterly cold winter, we have to wear heavy and awkward coats to keep warm.
- b. Answer this question using cumbersome and your own words:
What is something that is cumbersome to move?

Sample Answers:

- a. During the bitterly cold winter, we have to wear cumbersome coats to keep warm.
- b. A refrigerator is cumbersome to move.

Word #3: utter

When you u something, you say a few words or make a short sound like a scream. When Willy came up behind his sister and tickled her, she ued a cry of surprise. The man who was having a heart attack ued a few words and then fell to the ground. When Juanita saw the snake on the sidewalk in front of her, she ued a scream of fear.

utter & object--- (verb) to speak (sound) especially for a short time

- a. Rewrite: We could barely hear what our grandmother said right before she died.
- b. Answer: When might someone utter a few swear words?

Sample Answers:

- a. We could barely hear what our grandmother uttered .....
- b. Someone might utter a few swear words when they are angry at a careless driver.

Word #4: upsurge

When you have an u of feelings, the feelings surge up, or increase suddenly. There was an u of conflicting emotions, both joy and sadness, at the high school graduation party. The mother felt an u of love for the newborn baby she held in her arms. When a driver cut in front of me on the highway and almost caused an accident, I felt an u of anger rise up within me; I wanted to chase after the driver and tell him off.

upsurge of -- (noun) a sudden appearance of anger, feelings, etc.

- a. Rewrite this sentence using upsurge:
Akiko felt a sudden increase of joy after the winter quarter exams were finally over.
- b. Answer this question using upsurge and your own words:
What kind of upsurge do you feel when you notice someone is following you?

Sample Answers:

- a. Akiko felt an upsurge of joy after the winter quarter exams.....
b. I feel an upsurge of fear when I notice someone is following me.

Word #5: elicit

When you are able to e____t the information you need about a test, you are able to draw out the information from your teacher and get her to tell you what to study. After much questioning, the reporter e____ed the truth from the military general about the results of the battle. A tiger with its young is often gentle; however, a tiger's aggressive behavior is e____ed by the appearance of zebras. A child has an intense sense of right and wrong which can be e____ed by a good education.

elicit & object -- (verb) (formal) to get, draw out facts, information, behavior, etc.

- a. Rewrite: The lawyer could not get any information from the witness about the crime.
- b. Answer: What kind of information is it difficult to elicit from a bad teacher?

Sample Answers:

- a. The lawyer could not elicit any information from the witness .....
b. It is difficult to elicit clear explanations from a bad teacher.

Word #6: intuitive

Mandy had an i____e feeling that her friend was ill; somehow she knew without being told. Counselors should be i____e people who can understand how you feel just by being around you. My mother wanted to go home early because she had an i____e feeling that something was wrong at our house. I____e people know instinctively when a situation is safe or dangerous.

intuitive -- (adjective) having the power to understand something without reason

- a. Rewrite: Teachers who have the power to understand without reason can tell when students understand or don't understand their explanations.
- b. Answer: What kind of people have to be intuitive in order to succeed in their roles?

Sample Answer:

- a. Intuitive teachers can tell when students understand or don't.....
- b. Mothers have to be intuitive in order to know if their babies are sick or well.

Word #7: embody

When music e_____ies the feelings of a certain time, it expresses or represents the attitudes that people have at that time. Rap music often e_____ies the angry feelings that people have toward the injustices of American society. Martin's letter to the editor of the local newspaper e_____ied all his ideas about the war in the Persian Gulf. A country's flag e_____ies a nation's patriotism.

embody & object -- (verb) to express; represent

- a. Rewrite: The novel Black Rain expresses all of the horrors of nuclear war.
- b. Answer: What does a political cartoon embody?

Sample Answers:

- a. The novel Black Rain embodies all of the horrors.....
- b. A political cartoon embodies the opinion of the artist.

Word #8: detriment

When you do something to the d_____t of your health, such as taking drugs, you damage your health. Martin smoked a lot, to the d_____t of his lungs. Surprisingly, Tom was able to miss a lot of classes without d_____t to his grades. Strenuous exercise will cause no d_____t to your body if you do it safely.

detriment -- (noun with no plural) (formal) -- harm; damage

- a. Rewrite: Amazingly, Dennis crashed into a tree without any damage to his car.
- b. Answer: What action could cause detriment to a friendship?

Sample Answers:

- a. Amazingly, Dennis crashed into a tree without any detriment to his car.
- b. Dishonesty could cause detriment to a friendship.

Word #9: saturate

When a doctor s_____es a cotton ball with alcohol, she soaks it in alcohol before applying it to a patient's wound. The policeman was shot in the chest by an escaping bank robber, the blood s_____ing his shirt. Mary got caught out in a thunderstorm without an umbrella and the pouring rain s_____ed her clothes. Tony was halfway through the race when he began to feel the sweat s_____ing his shirt.

saturate & object -- (verb) to make completely wet; soak

- a. Rewrite: The woman soaked her face with suntan oil.
- b. Answer: What is junk food saturated with?

Sample Answers:

1. The woman saturated her face with suntan oil.
2. Junk food is often saturated with grease.

Word #10: incessant

When a person is an i_____t boaster, he never stops taking about how great he is. The irritated mother ordered her son to stop his i_____t complaining. Noriko was always getting headaches from the i_____t noise of traffic outside her apartment window; the noise never seemed to stop. The pipes froze and broke and an i_____t flow of water filled the house.

incessant -- (adjective) never stopping

- a. Rewrite: The elementary school teacher could not control the endless talking of the children during the fire alarm drill.

b. Answer: What kind of incessant behavior bothers you?

Sample Answers:

- a. The elementary school teacher could not control the incessant talking..
- b. Incessant worrying bothers me.

Word #11: discern

When you cannot d_____n even one word that is written on the blackboard, you need glasses. It was difficult driving in the fog; Jeffrey was just able to d_____n the road. Michie squinted her eyes, trying to d_____n the man walking toward her from a distance. If you are Japanese and can d_____n the difference between "r" and "l", then you have made a big step in being able to spell in English

discern & object -- (verb) (formal) to see, notice, or understand, especially with difficulty

- a. Rewrite: The reports about the war are so censored that it is difficult to see and understand the difference between truth and lies.

b. Answer: When the lights go out in your house, what is difficult to discern?

Sample Answers:

- a. The reports about the war are so censored that is difficult to discern the difference.....
- b. The furniture is difficult to discern when the lights go out.

Word #12: rigor

When an activity or situation is full of r____r, it is hard, severe and merciless. Few athletes can tolerate the r_____s of training for the Olympics. The r_____s of a winter in Alaska are many: bitter cold winds, raging snowstorms, and isolation. The r_____s of war tested the courage and endurance of the soldiers.

rigor -- (noun) a hard, severe condition; hardship

- a. Rewrite: Students with little money often have to withstand the hardships of trying to work full-time while going to school.

b. Answer: What activity or situation do you think is full of rigor?

Sample Answers:

- a. Students with little money often have to withstand the rigors of.....
- b. Living in poverty is full of rigor.

Word #13: affiliate

If you are a_____ed with the Democratic Party, you are a member of that political party. The Oregon Citizens Alliance is a_____ed with the conservative faction of the Republican Party; in other words, the Alliance has connected itself with the Republican Party. Our club is a_____ed with a national organization of similar clubs. The Portland Peace Institute is a_____ed with the Coalition Against U.S. Military Intervention in the Middle East.

affiliate with & object -- (verb) to join or connect (especially of a society or group)

- a. Rewrite: The environmental movement is connected with the anti-war movement.

b. Answer: What group or club are you affiliated with?

Sample Answers:

- a. The environmental movement is affiliated with the anti-war movement.
- b. I am affiliated with TESOL, an organization for teachers of English as a second language.

Word #14: anomaly

A cat without a tail is very unusual; it is an a____y. A man like Boy George who wears women's dresses is an a____y. Bubblegum-flavored ice-cream is an a____y compared to standard flavors like chocolate, strawberry and vanilla. A person who talks to himself in the mirror is an a____y.

anomaly -- (noun) (formal) a person or thing that is different from the usual type

- a. Rewrite: Dry weather in Oregon is an unusual thing.

- b. Answer: What kind of animal do you think is an anomaly?

Sample Answers:

- a. Dry weather in Oregon is an anomaly.
b. A dog that can't bark is an anomaly.

Word #15: cater

When newspapers and magazines try to c____r to all opinions, they attempt to provide information that is important to all types of people. My mother always complains that she is tired of c____ing to my every need. Saks Fifth Avenue, a clothing store in New York, c____s to very rich people. On the other hand, thrift stores that sell used clothing c____r to those with low incomes.

cater to somebody/something -- (verb) to take account of and provide with what is necessary

- a. Rewrite: National Geographic is a magazine that provides what is necessary to people who want to learn more about the different cultures in the world.

- b. Answer: Who do airlines cater to?

Sample Answers:

- a. National Geographic is a magazine that caters to people who.....
b. Airlines often cater to business travelers.

Word #16: amorphous

Have you ever notice that jello is a____s? It's always sliding around in the bowl and changing shapes. I can't understand Michael's a____s plans for spring vacation; they keep changing every day. Liquid is a____s because it changes shape depending on what container it is in. Henry can't sleep at night because he's been having confusing, a____s dreams.

amorphous -- (adjective) having no fixed form or shape

- a. Rewrite: H₂O is a changing substance that is sometimes water, sometimes ice, and sometimes steam.

b. What food is amorphous?

Sample Answers:

- a. H₂O is an amorphous substance that is.....
- b. Ice-cream is amorphous.

Word #17: align

When you a yourself with a cause, such as the civil rights movement, you agree with the cause, or put yourself in line with it. The students aed themselves with the workers in the struggle for freedom. Marcia as herself with the peace activists who are against the war in the Persian Gulf. John, on the other hand, supports military action in the Gulf and as himself with the opinions of President Bush.

align (somebody/something) with -- (verb) to cause to come into the same line as; to cause somebody to come into agreement with an argument, cause, etc.

- a. Rewrite: Maria agrees with the ballot measure that requires all Oregonians to wear seat belts.

b. Answer: What cause do you align yourself with?

Sample Answers:

- a. Maria aligns herself with the ballot measure.....
- b. I align myself with the environmental movement.

Word #18: correlation

When there is a c between two things, such as smoking and cancer, then the one thing (smoking) is said to cause the other (cancer). There is a high c between unemployment and crime; when people don't have jobs, they are more likely to turn to crime to make money. Scientists have proven the c between a heavy red meat diet and heart attacks. Is there a c between student motivation and good grades?

correlation between -- (noun) a shared relationship or causal connection

- a. Rewrite: There is a connection between exercise and stress level. When you exercise, you are less stressed.

- b. What behavior do you think has a correlation with traffic accidents?

Sample Answers:

- a. There is a correlation between exercise and stress level.
b. Speeding has a high correlation with traffic accidents.

Word #19: enumerate

The scientist e_____ed the steps to produce nuclear energy; in other words, he listed the steps one by one. Patricia doesn't like herself very well; in fact, yesterday she began to e_____e all of her faults. One by one, the astronaut e_____ed all of the difficulties he had when trying to walk on the moon. The child with a photographic memory could e_____e all the states' capitals after hearing them only once.

enumerate & object --- (verb) (formal) to name things on a list one by one

- a. Rewrite: Can you list all of the countries in Africa?

b. Answer: For which country can you enumerate all of the states (or provinces)?

Sample Answers:

- a. Can you enumerate all of the countries in Africa?
b. I can enumerate all of the states in the U.S.

Word #20: pertinent

If you ask p_____t questions, you ask direct questions and do not go off the topic. An environmentalist asked some very p_____t questions about how the proposed dam would affect fish in the river. The reporter only wanted p_____t facts about how many soldiers were killed in the battle; she didn't want information about the military strategies used. The impolite employee kept bringing up issues that were not p_____t to the purpose of the staff meeting.

pertinent (to) -- (adjective) (formal) connected directly (with something that is being considered); relevant

- a. Rewrite: Tom's classmates were annoyed when he kept asking the teacher questions that were not connected with the day's topic.

- b. Answer: What is a pertinent question to ask a teacher on the first day of class?

Sample Answers:

- a. Tom's classmates were annoyed when he kept asking the teacher questions that were not pertinent to the day's topic.
b. A pertinent question to ask is, "What are the requirements for this course?"

Word #21: postulate

When we p_____e that ghosts exist, we accept the idea without proof in order to explain strange happenings like doors opening by themselves. Many people p_____e that there is a God to explain the creation of the world and mankind. We cannot prove that heaven and hell exist; we have to p_____e them. Some people who have seen weird objects flying in the air p_____e that the objects are spaceships driven by aliens from another planet.

postulate (that) -- (verb) (formal) to accept (something that has not been proven as true) as a base for reasoning; to assume the truth with no proof

- a. Rewrite: For many centuries, Chinese herbalists have accepted as true that garlic can cure a wide variety of illnesses.
b. Answer: What do believers in fortune telling postulate?

Sample Answers:

- a. For many centuries, Chinese herbalists have postulated that.....
b. Believers in fortune telling postulate that it is possible to see the future.

Word #22: pendulum

A grandfather clock has a p_____, a weight that swings back and forth to keep the time. Public opinion about the president is like a p_____; it swings back and forth from approval to dislike. The national science museum has a giant p_____m that accurately tells the date and time based on the earth's movement. Like a p_____m, the condition of the economy swings from healthy to poor.

pendulum -- (noun) a weight hanging from a fixed point so as to swing freely, especially as used to control the working of a clock

- a. Rewrite: The weight on my cuckoo clock is broken, and the bird doesn't come out to tell the hour.
- b. Answer: What is something that swings back and forth like a pendulum?

Sample Answers:

- a. The pendulum on my cuckoo clock is broken, and.....
- b. An AIDS patient's health swings like a pendulum from good to bad.

Word #23: invoke

I i_____ed God's forgiveness for my sins; I called out to him and begged for forgiveness. Stretching out her hands, she had the look of a Greek woman i_____ing a God. The desperate woman on the highway i_____ed the help of other drivers; her car had broken down and she needed help pushing it off the road. Kristi in_____ed the participation of ESL students in this experiment.

invoke & object -- (verb) to call out to a power, like God, for help; to request or beg for.

- a. Rewrite: The firefighter requested the aid of his assistants at the scene of the fire.
- b. Answer: What can a person invoke God for?

Sample Answers:

- a. The firefighter invoked the aid of .....
- b. A person can invoke God for the answer to a problem.

Word #24: colloquial

You should not use c_____al , informal language in an academic research paper. On the other hand, a letter to a friend will sound cold if you don't use c_____al words. Foreign students are often not used to the c_____l style of lectures that many professors give here in the U.S. Often, newly-arrived ESL students have a difficult time understanding conversations because they have learned only formal language in their native countries, not c_____al language.

colloquial -- (adjective) (of words, phrases, style, etc.) of or suitable for ordinary, informal, or familiar conversation

- a. Rewrite: You rarely hear informal, conversational language used during a wedding ceremony.
- b. Answer: In what situation would you use colloquial language?

Sample Answers:

- a. You rarely hear colloquial language used during a wedding ceremony.
- b. You would use colloquial language in a conversation with friends.

REVIEW

Directions: Fill in the blanks with the words above each passage.

1. upsurge   intuitive   discern   uttering
     incessant   invoking   fluctuating

Mrs. Randolph was shopping at the grocery store when she suddenly had an i_____e feeling that her husband was in trouble. Earlier that morning, she had warned Mr. Randolph to be careful while he was up on their roof fixing a leak. She really didn't want him to up there in the first place; it was a dangerous activity for an old man who wasn't as strong and agile as he used to be. She didn't nag though because Mr. Randolph always said he hated her i_____t worrying.

Now, however, she knew something was wrong because she just could not control the u_____e of anxiety that overcame her. So she quickly paid for her groceries and rushed home.

When Mrs. Randolph got to her house, she looked up at the roof, but without her glasses she could not d_____n any movement. She ran into the house and searched every room, but found no sign of her husband. Finally, she decided to look outside and as she was walking around the house, out of the corner of her eye she caught a glimpse of a body lying behind a bush.

U_____g a cry of fear, she ran to her unconscious husband who was lying under an azalea bush. "Thank God, he's breathing," she thought as she quickly felt his neck for a heartbeat. When she found the heartbeat, it was f_____g wildly. "A heart attack!" she cried and in a second she was on the telephone calling the emergency room. As the seconds went by, Mrs. Randolph kept praying and i_____g God for help. "Please answer the phone," she pleaded.

2. elicit   amorphous   cater
     pertinent   colloquial

I am becoming very frustrated with my literature professor. He doesn't seem to c_____r at all the needs of foreign students. In his lectures, he speaks with such c_____l language that I can never

understand what he is saying. All I hear is an a_____s mass of slang words which have no meaning to me. I try to ask p_____t questions, but I just can't seem to e_____t the information I need to understand him. I just don't know what to do.

3. enumerating   cumbersome
rigors   saturated

We live in a house with no heat source except for a wood stove. My husband has taken over the responsibilities of keeping the stove burning, and to make sure I know how hard this is, he is constantly e_____g the r_____s involved: First, you have to unload a truckload of c_____e wood into the woodshed; then you must split the wood; and finally, you must haul the wood to the house in a wheelbarrow. By this time, your shirt is s_____d with sweat and you are so hot that you don't even need the heat of the wood stove anymore.

4. correlation   embody
affiliated   postulates

The high school teacher has a theory; she p_____s that there is a c_____n between students' grades and the number of extracurricular activities they participate in. It appears that those students who are a_____d with and active in a lot of clubs have higher grades than those students who are not as involved in outside activities. The teachers thinks that those students who are busy have to better manage their time, so they are more efficient and not as lazy when doing their homework. Personally, I think there is more to it than that. I believe students' grades e_____y their motivation level; if students are highly motivated people they will try to get good grades and participate in many school activities.

5. align   anomaly
pendulum   detriment

The homeless man who wanders around the university park pushing a shopping cart is somewhat of an a_____y. No one can predict what he will do next because his moods swing back and forth like a p_____m. At times he a_____ns himself with the students, eagerly participating in rallies and concerts in the park blocks. At other times he is a d_____t to society, cursing passersby and threatening them with a big stick.

APPENDIX D

FIRST COMPREHENSION TEST

Name _____

Native Language _____

Nationality _____

Gender _____

VOCABULARY COMPREHENSION TEST

Directions: Choose the right word to go with each meaning. Write the number of the word next to its meaning. Extra words are in the test to make it more difficult. You do not have to find a meaning for those words.

1. incessant

2. amorphous _____ having no fixed form or shape

3. cumbersome _____ never stopping

4. divine _____ heavy and awkward

5. finite

6. objective

1. monarch

2. propensity _____ a person or thing that is different from the usual type

3. rigor

_____ a severe, hard condition

4. proprietor

5. correlation _____ a shared relationship or causal connection

6. anomaly

1. prevail

2. verify _____ to make completely wet; soak

3. align _____ to see or understand with difficulty

4. repudiate _____ to cause to come into agreement with an argument cause, etc.

5. saturate

6. discern

1. colloquial

2. pertinent _____ relevant; connected directly with something being considered

3. rudimentary _____ (of words, phrases) of or suitable for informal conversation
4. trivial _____
5. subtle _____ having the power to understand something without reason
6. intuitive _____
-
1. expose _____
2. integrate _____ to name things on a list one by one
3. impose _____ to rise and fall; change
4. fluctuate _____ to call out for help; request or beg for
5. enumerate _____
6. invoke _____
-
1. upsurge _____
2. denominator _____ a sudden appearance of emotions
3. detriment _____ a weight that swings back and forth
4. criterion _____ harm; damage
5. pendulum _____
6. innovation _____
-
1. defer _____
2. convert _____ to get, draw out facts, information, etc.
3. elicit _____ to assume the truth with no proof
4. postulate _____ to join or connect (especially of a society or group)
5. affiliate _____
6. modify _____

1. evaporate

2. embody

_____ to speak (sound) for a short time

3. utter

_____ to take account of and provide what is necessary

4. emancipate

_____ to express; represent

5. cater

6. degenerate

APPENDIX E

SECOND COMPREHENSION TEST

Name _____

Native Language _____

Nationality _____

Gender _____

VOCABULARY COMPREHENSION TEST

Directions: Choose the right word to go with each meaning. Write the number of the word next to its meaning. Extra words are in the test to make it more difficult. You do not have to find a meaning for those words.

1. align

2. refute _____ to cause to come into agreement with an argument, cause, etc.

3. saturate

_____ to make completely; soak

4. stipulate

_____ to see or understand with difficulty

5. discern

6. transmit

1. invoke

2. assimilate _____ to rise and fall; change

3. suppress _____ to name things on a list one by one

4. administer _____ to call out for help; request or beg for

5. fluctuate

6. enumerate

1. feasible

2. cumbersome _____ heavy and awkward

3. incessant _____ never stopping

4. diverse _____ having no fixed form or shape

5. amorphous

6. subtle

1. upsurge

2. innovation _____ a sudden appearance of emotions

3. detriment _____ a weight that swings back and forth

4. pendulum _____ harm; damage

5. denominator

6. niche

1. disperse

2. advocate _____ to get, draw out facts, information, etc.

3. affiliate _____ to join or connect (especially of a society, or group)

4. emancipate

_____ to assume the truth with no proof

5. postulate

6. elicit

1. propensity

2. rigor _____ a shared relationship or causal connection

3. correlation _____ a severe, hard condition

4. commodity _____ a person or thing that is different from the usual type

5. metabolism

6. anomaly

1. cater

2. impose _____ to express; represent

3. embody _____ to take account of and provide what is necessary

4. utter _____ to speak (sound) for a short time

5. precede

6. degenerate

1. superficial

2. obsolete

_____ having the power to understand something without reason

3. prudent

4. intuitive

_____ (of words, phrases) of or suitable for informal conversation

5. colloquial

_____ relevant; connected directly with something being considered

6. pertinent

APPENDIX F

RECALL TEST

Name _____

Native Language _____

Nationality _____

Gender _____

VOCABULARY RECALL TEST

Directions: Below are definitions for the words you were introduced to in the vocabulary lesson. Try to write the word that corresponds to each definition. You will be given credit for partial knowledge of words, so GIVE ANY INFORMATION THAT YOU CAN REMEMBER ABOUT THE WORDS (i.e. -- spelling, number of syllables, and primary stress). Steps: 1) Write what letters you can remember of the word; 2) Circle the number of syllables the word has; and 3) Circle the number of the syllable with the most stress. For example, the word "reporter" has three syllables (re/por/ter) and the primary stress is on the second syllable (re/pór/ter). This is how you would answer:

EXAMPLE:

<u>DEFINITION</u>	<u>WORD</u>	<u># OF SYLLABLES</u>	<u>SYLLABLE WITH THE MOST STRESS</u>
a. a person who writes about news for a newspaper	reporter	1 2 (3) 4	1 (2) 3 4

<u>DEFINITION</u>	<u>WORD</u>	<u># OF SYLLABLES</u>	<u>SYLLABLE WITH THE MOST STRESS</u>
1. to cause to come into agreement with an argument, cause, etc.		1 2 3 4	1 2 3 4
2. a sudden appearance (especially of emotions)		1 2 3 4	1 2 3 4
3. to join or connect (especially of a society or group)		1 2 3 4	1 2 3 4
4. relevant; connected directly with something being considered		1 2 3 4	1 2 3 4
5. heavy and awkward		1 2 3 4	1 2 3 4

DEFINITION	WORD	# OF SYLLABLES	SYLLABLE WITH THE MOST STRESS
6. to assume the truth with no proof		1 2 3 4	1 2 3 4
7. severe, hard conditions		1 2 3 4	1 2 3 4
8. having no fixed form or shape		1 2 3 4	1 2 3 4
9. to rise and fall; change		1 2 3 4	1 2 3 4
10. to make completely wet; soak		1 2 3 4	1 2 3 4
11. to see or understand with difficulty		1 2 3 4	1 2 3 4
12. to name things on a list one by one		1 2 3 4	1 2 3 4
13. to get, draw out facts, information..		1 2 3 4	1 2 3 4
14. a shared relationship or causal connection		1 2 3 4	1 2 3 4
15. a weight that swings back and forth		1 2 3 4	1 2 3 4
16. (of words, phrases) of or suitable for informal conversation		1 2 3 4	1 2 3 4
17. having the power to understand something without reason		1 2 3 4	1 2 3 4

DEFINITION	WORD	# OF SYLLABLES	SYLLABLE WITH THE MOST STRESS
18. to speak (sound) for a short time		1 2 3 4	1 2 3 4
19. to express; represent		1 2 3 4	1 2 3 4
20. harm; damage		1 2 3 4	1 2 3 4
21. a person or thing that is different from the usual type		1 2 3 4	1 2 3 4
22. to call out for help; request or beg for		1 2 3 4	1 2 3 4
23. to take account of and provide what is necessary		1 2 3 4	1 2 3 4
24. never stopping		1 2 3 4	1 2 3 4

APPENDIX G

STRATEGY INVENTORY

Strategy Inventory for Language Learning (SILL)

Version for Speakers of Other Languages Learning English

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Version 7.0 (ESL/EFL)

(c) R. Oxford, 1989

Directions

This form of the STRATEGY INVENTORY FOR LANGUAGE LEARNING (SILL) is for students of English as a second or foreign language. You will find statements about learning English. Please read each statement. On the separate Worksheet, write the response (1, 2, 3, 4, or 5) that tells HOW TRUE OF YOU THE STATEMENT IS.

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

NEVER OR ALMOST NEVER TRUE OF ME means that the statement is very rarely true of you.

USUALLY NOT TRUE OF ME means that the statement is true less than half the time.

SOMEWHAT TRUE OF ME means that the statement is true of you about half the time.

USUALLY TRUE OF ME means that the statement is true more than half the time.

ALWAYS OR ALMOST ALWAYS TRUE OF ME means that the statement is true of you almost always.

Answer in terms of how well the statement describes you. Do not answer how you think you should be, or what other people do. There are no right or wrong answers to these statements. Put your answers on the separate Worksheet. Please make no marks on the items. Work as quickly as you can without being careless. This usually takes about 20-30 minutes to complete. If you have any questions, let the teacher know immediately.

STRATEGY INVENTORY FOR LANGUAGE LEARNING

EXAMPLE

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

Read the item, and choose a response (1 through 5 as above), and write it in the space after the item.

I actively seek out opportunities to talk with native speakers of English. _____

You have just completed the example item. Answer the rest of the items on the Worksheet.

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1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
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5. Always or almost always true of me

(Write answers on Worksheet)

Part A

1. I think of relationships between what I already know and new things I learn in English.
2. I use new English words in a sentence so I can remember them.
3. I connect the sound of a new English word and an image or picture of the word to help me remember the word.
4. I remember a new English word by making a mental picture of a situation in which the word might be used.
5. I use rhymes to remember new English words.
6. I use flashcards to remember new English words.
7. I physically act out new English words.
8. I review English lessons often.
9. I remember new English words or phrases by remembering their location on the page, on the board, or on a street sign.

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Part B

10. I say or write new English words several times.
11. I try to talk like native English speakers.
12. I practice the sounds of English.
13. I use the English words I know in different ways.
14. I start conversations in English.
15. I watch English language TV shows spoken in English or go to movies spoken in English.
16. I read for pleasure in English.
17. I write notes, messages, letters, or reports in English.
18. I first skim an English passage (read over the passage quickly) then go back and read carefully.

1. Never or almost never true of me
2. Usually not true of me
3. Somewhat true of me
4. Usually true of me
5. Always or almost always true of me

(Write answers on Worksheet)

19. I look for words in my own language that are similar to new words in English.
20. I try to find patterns in English.
21. I find the meaning of an English word by dividing it into parts that I understand.
22. I try not to translate word-for-word.
23. I make summaries of information that I hear or read in English.

Part C

24. To understand unfamiliar English words, I make guesses.
25. When I can't think of a word during a conversation in English, I use gestures.
26. I make up new words if I do not know the right ones in English.
27. I read English without looking up every new word.
28. I try to guess what the other person will say next in English.
29. If I can't think of an English word, I use a word or phrase that means the same thing.

Part D

30. I try to find as many ways as I can to use my English.
31. I notice my English mistakes and use that information to help me do better.
32. I pay attention when someone is speaking English.
33. I try to find out how to be a better learner of English.

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- 34. I plan my schedule so I will have enough time to study English.
- 35. I look for people I can talk to in English.
- 36. I look for opportunities to read as much as possible in English.
- 37. I have clear goals for improving my English skills.
- 38. I think about my progress in learning English.

- 1. Never or almost never true of me
- 2. Usually not true of me
- 3. Somewhat true of me
- 4. Usually true of me
- 5. Always or almost always true of me

(Write answers on Worksheet)

Part E

- 39. I try to relax whenever I feel afraid of using English.
- 40. I encourage myself to speak English even when I am afraid of making a mistake.
- 41. I give myself a reward or treat when I do well in English.
- 42. I notice if I am tense or nervous when I am studying or using English.
- 43. I write down my feelings in a language learning diary.
- 44. I talk to someone else about how I feel when I am learning English.

Part F

- 45. If I do not understand something in English, I ask the other person to slow down or say it again.
- 46. I ask English speakers to correct me when I talk.
- 47. I practice English with other students.
- 48. I ask for help from English speakers.
- 49. I ask questions in English.
- 50. I try to learn about the culture of English speakers.

APPENDIX H

STUDENT CONSENT FORM

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I, _____, agree to help Kristi DuBois in her research project on vocabulary teaching methods.

I understand that Kristi will ask me to do a vocabulary lesson and take several vocabulary tests. I know she will also ask me to answer written questions about my learning strategies.

Kristi has explained to me that the purpose of the study is to find out which of two vocabulary teaching methods is better.

This study will help me to learn my vocabulary level, learning style, and twenty-four new English words. The study may also help other teachers in the future.

Kristi has offered to answer any questions I may have about the study. She has told me that there is no danger to me in this research project because my name and identity will be kept private when this study is talked about and published.

I understand that helping with this research project will not affect my grade in this class, and I am free to stop participating in this study at any time.

I have read and understood the above information and agree to participate in this study.

Date _____ Signature _____

If you have any problems in this study, please call the Chair of the Human Subjects Research Review Committee, Office of Grants and Contracts, 303 Cramer Hall, Portland State University, (503) 725-3417.