

Clarifying and Resurrecting the Semantic Field Keyword Approach for Rapid Lexical Acquisition: Employing Semantic Organization, Bilingual Computerized Glosses and Pushed Output Generation to Enhance L2 Vocabulary Learning

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Abstract

How can one help language learners build up a large vocabulary quickly, especially those who intend to do further academic or technical study and work in English? Meara (1995) suggested that some sort of keyword method memory system might be part of the answer. This writer agrees, recommending more systematic use of Crow and Quigley's (1985), and Crow's (1986a & b) Semantic Field Keyword Approach for practicing both common, essential common core "Keyword Vocabulary," expanding its categories by learning semantic sets together with productive activation or "pushed output." In this study an innovative computer-assisted system is proposed for learning a large number of new words more rapidly and productively within logically related "Semantic Field Keyword Groups." It examines the role of generative processing in productive vocabulary acquisition, showing that the Semantic Field Keyword Approach, enhanced by the use of fully bilingualized electronic dictionaries, may be one of the most effective keyword methods available for second or foreign language vocabulary acquisition. Since it rapidly presents groups of related words together clustered under simpler common Keywords, it holds promise of being particularly effective for intermediate and advanced learners needing a systematic CALL-enhanced "vocabulary flood" to help spur their lexical development.

1. Introduction:

Although many foreign language learners appear to use only a limited number of language and lexical learning strategies, as do most of the Japanese college students surveyed in this study, teachers who want to be more effective are looking for some system that can combine as many proven strategies, good ideas and resources as possible to help their students to more quickly improve their vocabulary, reading comprehension, and language learning skills. Since building learners' understanding of word meanings is so crucial to any other language development, the following reason- and research-based taxonomy is recommended to help teach students how to more systematically and successfully process new target language (TL) vocabulary. Segler, Pain, and Sorace (2001) surveyed

strategy types and training for typical classrooms, seeking ways to use ICALL environments to better enhance second language vocabulary acquisition. Vocabulary learning strategies (or VLS) are a crucial sub-class of general language learning strategies, although little detailed study has been done yet in the area of VLS taxonomy development, other than that of Stoffer (1995), Schmitt (1997), and Kudo (1999). This study contributes to Second Language Vocabulary Acquisition (SLVA) taxonomy development, ICALL or Intelligent Computer-Assisted Language Learning-enhanced SLVA, and English for Advanced/Special Purposes (EAP/ESP) Vocabulary Development areas.

2. The Mnemonic Keyword Approach versus Keyword Groups Using Semantic Fields

Hulstijn (1997) compared various “Imagery Mnemonic” Keyword Methods, but did not give a complete summary of keyword methods, since he completely overlooked several other kinds of keywords, including what may be the best keyword method available for rapid acquisition of academic and advanced vocabulary (EAP/ESP/AWL or Academic Word List, Coxhead, 1998, 2000) — the “*Semantic Field Keyword Approach*,” (or SFKA). Nevertheless, he does present good overviews of various studies done on the *Imagery Mnemonic Keyword Method* (IMK), which will be summarized briefly in this comparison. It might be useful to do a head-to-head comparative research test of these two major types of Keyword methods, but first of all one must be clear about the vast differences between various keyword methods.

Another sort of keyword studied by those who compile word frequency lists, is the use of *significantly frequent keywords* in short reading texts. However research on how effective such concordancing programs are in helping students to better focus on these “*High-Frequency Keywords*” (HFK) is yet in short supply. Thornbury (2002) notes, however, that concordances are beginning to appear in some textbooks, such as Mohamed and Acklam’s *The Intermediate Choice* (2000, Longman). Pedagogical benefits of using concordancing programs and approaches include the following ways in which they help learners to focus on these important “*High-Frequency Keywords*.”

Using a concordancer (a program that searches for words in a text and sorts them into lines), any of these words can become the focus of a concordance... learners can [then] list the verbs that collocate [with various keywords, and one] doesn’t need a computer to display the information. Learners can make their own concordance lines by simply writing out all the sentences, or parts of sentences, that include the [Key-] word... and aligning them accordingly...

The extra effort involved in compiling their own concordance may help draw learner’s attention to salient features of the text. Alternatively, the teacher can provide learners with a concordance with the target [Key-] word (called the **node**) blanked out. The learners task is to work out what the missing word is—i.e. what one word would fit all of the displayed contexts? (Thornbury, pp. 71-71)

Teachers can also use “High-Frequency Keyword” programs, such as Nation’s *Vocabulary Profiler* (2003), to plot certain keywords in a particular text with a larger corpus of text, such as the General Service List (West, 1953) or Coxhead’s (1998, 2000) Academic Word List, to see what type of words are present and with what frequency. The language learning benefits of focusing on such High-Frequency Keywords are further explained by Thornbury (2002, p. 73) as follows.

Notice how the keywords tend to be nouns. Notice also that they provide a kind of very condensed summary of the story. *Understanding the keywords of a text is a large part of understanding the text itself. So, when choosing words to pre-teach in advance of reading, a teacher need look no farther than the keywords.* Also, giving learners the keywords of a text in advance of their reading the text is an excellent way of activating their knowledge of the topic of the text. Once activated, this knowledge allows them to make better sense of the text.

Despite his detailed attention to several ways of using the Imagery Mnemonic Keyword Method, Hulstijn unfortunately (1997) fails to mention either this concordancer type of High-Frequency Keyword, or the very natural, useful and contextual Semantic Field Keyword Approach, developed by Crow (1985) and Quigley (1986). Research on the effectiveness of the Imagery Mnemonic Keyword Method is nonetheless well documented and analyzed by him. Other research on mnemonic types of keyword methods, as Hulstijn (1997:204) summarizes it, was originally done by Atkinson (1975; Atkinson & Raugh, 1975). That study was of course ten years before Crow and Quigley’s Semantic Field Keyword Approach came out. Rudzka, Channell, Putseys, and Ostyn’s (1981)

text also used such an approach.

This Imagery Mnemonic Keyword Method was also popularized by Pressley and Levin's research (Pressley, Levin & McDaniel, 1987). Again, being just one year after Quigley's dissertation (1986), it is unlikely that they were aware of it, although she and Crow thoroughly explained their approach in a TESOL publication in 1985 (Sept.: *TESOL Quarterly* 19, No 3, pp. 497-510).

Cohen's review (1987) of at least Imagery Mnemonic Keyword Method literature at first appears to be more thorough, although again unfortunately it is only focused on "The use of verbal image mnemonics in second-language vocabulary learning," as its title indicates. Again it may have been too close to the time when Crow & Quigley's research was released, so that Cohen too seems to have been unaware of its much greater potential. A brief characterization of the Imagery Mnemonic Keyword Method will be helpful to more clearly distinguish it from the Semantic Field Keyword Approach, which they espoused, that sadly has gone rather unnoticed and unimplemented by much of the vocabulary research community until this study.

Hulstijn (p. 204) reviewed the Imagery Mnemonic Keyword Method, describing its three stages:

- 1) an L1 or L2 word, preferably referring to a concrete entity, is chosen based on acoustic and/orthographic similarity with the to-be-learned L2 target word (thus Imagery Mnemonics often work much better with cognate languages);
- 2) a strong association between the target word and the keyword must be constructed, so that the learner, when seeing or hearing the target word, is reminded immediately of the keyword;
- 3) a visual image must be constructed combining the referents of the keyword and the target word, preferably in a salient, odd, or bizarre fashion in order to increase its memorability.

This method appears at first glance to be interesting, but asking language learners to try to generate a verbal or visual image, which they can then associate with a target word may only be imposing an extra vocabulary or learning burden on often already cognitively overloaded language learners, especially

those at a lower proficiency level. Even Hulstijn (1997: 220) concludes that "mnemonic techniques should not replace the more natural, contextual methods fostering incidental learning." Once again it seems clear that this Imagery Mnemonic Keyword Method appears to have only very limited instructional use, as it can only be applied to certain types of words in some cases, perhaps with more advanced and imaginative language learners. *Its limited occasions of use must also meet two conditions: a) having formal or sound similarity, and b) having an imaginable semantic relationship.* Furthermore, by virtue of its defining conditions the Imagery Mnemonic Keyword Method of using mnemonic techniques *can't be used with many words*, whereas the Semantic Field Keyword Approach can be.

Hulstijn (1997: 218) agrees with Coady (1987) and Nation (1982: 25-29) in saying that "mnemonic techniques must not be used with all words, but only with words that have shown up as being particularly difficult." Despite Nation's cautions about possible interference caused by teaching too many related words together at earlier stages of language instruction (Nation, 2000), this study shows that more advanced students can benefit greatly by using a bilingual, computer-enhanced Semantic Field Keyword Approach, such as that described here. He also notes that *headword coordinates [also known as superordinates]* are the most helpful of all types of lexical sets, which Semantic Field Keywords are. (For more on the debate about interference and the effects of semantic clustering, see Tinkham, 1993, 1997; Waring, 1997; and Petersen, 1997.)

Thus it seems that leading vocabulary scholars themselves would only recommend this Mnemonic Keyword approach in certain limited cases, and that it is not a broadly applicable theory for L2 vocabulary learning. Generating artificial mental images rather than using natural, logical relationships and mental associations based on meaning, which vocabulary learning essentially is, are the bottom-line basic distinctions between an Imagery Mnemonic Keyword Method on the one hand, and a Semantic Field Keyword Approach on the other. But how do an Imagery Mnemonic Keyword Method versus a Semantic Field Keyword Approach compare in their applica-

tions?

Key principles of vocabulary learning adopted in recent decades by most ESL/EFL scholars and teachers are well-summarized by Hulstijn (1997: 214). With this practical pedagogical question in mind, let us focus on using these principles to compare them:

- 1) New vocabulary items should not be presented in isolation (i.e., only with their L1 equivalent, and without a verbal L2 context) and should not be learned in rote fashion.
- 2) New vocabulary items should be presented in a meaningful context (preferably authentic or quasi-authentic contexts, preferably offering enough clues to allow learners to successfully infer their meaning).
- 3) Learners should elaborate on a new word's form and meaning in order to facilitate retention.

Contrary to these well known principles, Mnemonic Keywords are often generated in isolation as short-term proxies, and many times not in meaningful contexts, but rather artificially as short-term memory supports. Such short-term links, while useful in helping to create short-term memory traces, are not elaborated on to facilitate long-term retention, but rather become phased out once actual translation equivalents take their places. In support of the first principle above, Laufer and Hadar's 1997 study has shown that having access to both L1 and L2 dictionary information is far more effective as well as preferred by most foreign language learners. With regard to the second, the Imagery Mnemonic Keyword Method cannot in any sense be considered to be contextual or authentic. On the other hand, the Semantic Field Keyword Approach develops its materials based on both authentic and quasi-authentic contexts. All exercises are developed based on real academic readings, or simplifications thereof, offering many context clues and interesting content to help students learn many embedded meanings together as a group at one time. Content is also attractive, natural and motivating.

The third principle that language learners should be required to process and elaborate on a target word's form and meaning is part of the "Five Essential Steps" to all vocabulary learning, as Hatch and Brown (1995) pointed out. Briefly, what better way can language

learners 'elaborate on' a new word's form and meaning than *by real activation through expressive use*? Clearly the best and most natural way seems to be for students to be required to try to use new L2 terms actively in their own productive expressions, as was done in this study. For example, Semantic Field Group Keywords can be used in learner-generated sentences by related word groups, with substitution drills done using all 4-5 other similar words in the same sentence to help fix all of their meanings into their lexical memory bank at one shot.

Learners need to learn various ways to link the form of new TL vocabulary with their meanings, such as: 1) by asking, 2) by inferring/guessing from context, 3) by checking various kinds of dictionaries (both book and computerized, and both bilingual and monolingual), and 4) by engaging socially in the negotiation of new meanings through interactive communication exchanges. As Ellis (1997, p. 136) points out, "learners must consolidate the memory of this label-meaning-pair if it is not to be an ephemeral knowing... there are conscious, strategic processes which can facilitate this." Whereas so-called "Imagery Mediation" tends to use similar sights or sounds to create short-term mnemonic device triggers or cues, "Semantic Mediation" can also be used to build longer term associative memory networks that last.

In sum, it appears that Crow and Quigley's Semantic Field Keyword Approach may be by far the most natural, effective and contextually appropriate method for learning almost any words. This is because a Semantic Field Keyword Approach is based not on artificial or bizarre images that are limited only to concrete nouns or actions, but is rather based on how the human mind naturally works by using natural associative networks. When using it the context and topics of any text are considered first, then vocabulary instructional materials are designed based on authentic articles in a variety of subject areas, such as the natural or social sciences. Vocabulary units are developed by selecting possibly difficult words. "Keyword Groups," or key phrases are selected and a "Keyword Group" is built up around it by choosing 4-5 words from the same semantic field. Thus units may have 12-36 Keyword Groups, each containing 5-6 words having similar meanings. In this way language

learners are exposed much more quickly than normal to large volumes of related terms, having similar semantic fields. Language learners can cover and acquire larger numbers of L2 passive vocabulary much more quickly using this approach. As Quigley's study showed, at least twice as many words could be learned in this way as would be the case by traditional vocabulary instructional methods. This is many times more words than they would ever meet even doing large quantities of extensive reading, which very few low proficiency language learners can or would ever be able to do. Thus this method may be limited to upper intermediate and more advanced learners.

Semantic Field Keyword Approach exercises are intentionally designed, in Quigley's study (1986, p. 23) to help "reinforce the connection between the related words and their keywords." Exercises begin at the word level, then proceed to sentence and paragraph levels. Quigley's study only required students to use these new terms receptively, never actively, in contrast to the emphasis on productive use in this study. Her examples included the following types (p. 24): "The different types of exercises required the students to 1) substitute the keyword for related words, 2) substitute related words for keywords in context, or 3) pick out the unrelated word from a group of related words. Each unit also contained one or more word puzzles. All exercises required recognition skills only, whereas productive recall and use were tested in this study.

Although Crow and Quigley's materials only required students to use these new terms receptively, this writer has been testing the use of Crow and Quigley's Semantic Field Keyword Approach for improving both passive and active vocabulary acquisition, coupled with his own dynamic Vocabulary Knowledge Scale called a Dual Assessment Vocabulary Instructor-Evaluator, which was designed for use with Japanese students. It may be used for dual assessment in several ways. First, it may be used by students to self-assess their own vocabulary knowledge, or alternatively by teachers to assess student's actual recorded lexical feedback. Secondly, it may be used either to assess Receptive Input or Productive Output. Thirdly, it has two different scoring scales for productive output, one being a simple percentage of

words known or unknown for each of categories A-E, the other being a rated scale. Teachers are free to use either type of assessment, depending upon their time constraints and the type of lexical knowledge they want to assess

Whatever types of keywords are used, it is now clear that vocabulary learning requires active mediation by the teacher. Use of Mnemonic or Imaging Keywords can often help best when trying to anchor new TL terms into one's short-term memory. Such L1 or even L2 visual or auditory links help to hook new words into neural networks. Use of the Semantic Field Keyword Approach, however, helps fix new terms into long-term associative memory networks. Both are useful in learning, but the later means has up to now been quite overlooked in both theory and practice, despite its great usefulness. For these reasons this study was done, seeking to make the latter method even more effective by adding both fully bilingualized glosses and an ICALL environment as well. When used together with 1) a user-friendly Vocabulary Learning Scale (VKS), such as the DAVIE, 2) a Depth of Lexical Processing Taxonomy, and 3) a Vocabulary Learning Strategies (VLS) Taxonomy, a Semantic Field Keyword Approach can help to make L2 vocabulary presentation and learning maximally effective for both receptive understanding and productive use of new word forms and meanings.

3. Methods Used and Contexts Tested:

Indeed the human mind does seem to build up memory structures by chunking units of related meaning recursively, leading to a hierarchical organization of meaningful human knowledge and experience. In order to test the effectiveness of chunking into semantic field groups having similar basic meanings, we used 276 upper intermediate to advanced words found in the History chapter's 36 semantic fields or sets of six words each categorized under common, simpler Keywords from Crow's (1986) *Vocabulary for Advanced Reading Comprehension: The Keyword Approach*. Japanese junior college females' learning was compared in several contexts:

A. In pilot studies when using a Sustained Silent

Reading (SSR) Extensive Reading approach, to see if they could learn any of these words simply through independent, incidental reading alone. Most could not.

- B. When using a monolingual *Hypercard* program to learn twelve groups of these words.
- C. When using paper text and bilingual book dictionaries.
- D. When using paper text versus immediate access glossing using computerized devices.
- E. When using a teacher-designed, computerized Semantic Field program, giving students immediate access glossing. This combination of a portable floppy disc Excel PC program and a Website, (both of which offered fully bilingual, computerized glossing) enabled language learners to get both benefits automatically. Results with both ESL and EFL students, despite a limited sample size, seem to support its superior effectiveness over most textual dictionaries or approaches being used now.

Finally, the central thrust and focal question of this study of lexical acquisition is this: Can TL vocabulary be taught to foreign language learners more effectively in larger units in a linguistically well-organized way, combining insights from both corpora and frequency studies as well as those of schema and semantic field associative memory research? Based on initial results of this study it appears that this can be done. Research findings and principles given by many other vocabulary researchers also seem to strongly support this contention. Combining the benefits of both more focused and intentional Intensive Reading (IR) with advantages of Extensive Reading (ER) using more CAI/CALL and Web-mediated instruction in line with known principles of reliable reading and vocabulary acquisition theory is also necessary in order to arrive at a more balanced and effective foreign language program. Beneficial aspects of both IR and ER could be better facilitated by CAI/CALL and Web-based methods and materials to enhance vocabulary learning, activation and assessment.

Procedure: All students were given a pre- and post-instruction Vocabulary Knowledge Scale designed by the author, known as a Dual Assessment

Vocabulary Instructor-Evaluator (DAVIE), which consists of five categories of word knowledge: A. Japanese translation known, B. English definition known, C. English sentence known, D. Unclear, but familiar, common collocational phrase remembered, and E. Unknown or unfamiliar.

A longer-term Semantic Field Keyword study was done as explained below, using all nine units of Crow's (1986) original text. In this study participants' perceived knowledge of words in each chapter was first assessed by receptive pre-test self-reports. These were accepted as accurate enough representations of learners' vocabulary knowledge, having been tested the previous year with one hundred students using up to 200 words each. (See Author, 2000a, 2003c.) Participants' productive posttest scores were based on actual demonstrated knowledge, as shown when learners recognized and recorded TL vocabulary words for each of these nine chapters correctly, either by giving a correct A. Japanese translation, B. English definition, or C. English sentence. Overall results for all 1,944 words tested by 216 words per chapter are shown in SFKA Sample Table 1 below.

Participants: There were nine original participants in this study, four of whom finished. Only four students of either upper intermediate or advanced level were sufficiently motivated in their TOEFL or SAT preparation studies to complete the course as well as this study. Two of these students were ordinary Japanese junior college English majors who planned to study overseas in the near future. The other two were Japanese-American children of the author who had finished Japanese elementary school, and then an English junior high program by independent homeschooling study (3 and 4 years each). All of their vocabulary levels were computed, as well as their self-reported degree of knowledge for each target word, and results of their productive use of any words that were new to them individually, with average number of words learned per chapter shown in Table 4. Five other students (whose pre-test survey scores are shown) were assessed in pre-instruction surveys, although they did not complete the course.

Materials Used: An author-designed Website and Floppy-Disc Excel file of all words from Crow's (1986a) text, arranged by using Crow and Quigley's

Semantic Field Keyword Approach.

Both Quigley and Crow (1986) designed their original materials for advanced level college students from overseas studying English in the US, or needing to rapidly develop their English reading skills in particular for higher level academic study. Crow's text notes (1986, pp. ix-xiii) that since these students' greatest hindrance to fluent L2 reading is an inadequate passive vocabulary, his [SFKA] Keyword Approach is intended to help them "build a large recognition vocabulary in a short time." Each of his chapters has 36 Keyword Groups with five other related words, thus covering 1,620 intermediate and advanced terms used in nine natural and social science subject areas.

4. Sample of Materials

A sample of this approach, showing one set of twelve Related Keyword Groups is given below in Table 1. In each unit of study there are three such sets.

This sample shows the first ten Related Keyword Groups from Chapter 1 on Science. All Keywords included bilingual glosses to help speed up learning each group by giving learners immediate access to computerized glossing, made available to them both online and on floppy discs. The first word in blue is the simpler Keyword, followed by five words within the same Semantic Field Set, each having similar or related meanings to that simpler Keyword.

All 324 Related Keyword Groups were presented to students both by means of individual floppy discs as well as online at the teacher's website with Japanese definitions to ease their learning burden. Students

Table 1: Sample of Related Keyword Groups, from Science Chapter, 1-1

1. crazy (狂った)	2. very (とても)
insane (正気でない)	extremely (極度に, とても)
mad (気が狂った)	intensely (激しく, 強烈に, 熱心に)
maniacal (熱狂的な)	considerably (かなり, ずいぶん)
lunatic (実にばかげた)	immensely (とても, すごく, 非常に)
deranged (~を狂わせる)	exceedingly (非常に, とても)
3. doubt (疑う)	4. to invent (発明する)
hesitation (ためらい)	contrive (~を考案する)
qualm (不安, 心配)	create (~を創造する)
uncertainty (不確実に)	forge (~を偽造する)
suspicion (疑い)	think up (~を考え出す)
misgiving (疑い, 不安)	devise (~を工夫する)
5. to twist (~を無理にねじる)	6. method (方法)
disfigure (~を傷つける)	process (過程, 工程, 方法)
contort (物・手足などをひどくねじる)	way (方法)
bend (ねじ曲げる)	manner (方法, やり方)
warp (板を曲げる, 心・判断をゆがめる)	system (体制)
distort (物・顔などをゆがめる)	procedure (手順, 順序)
7. to choose (選ぶ)	8. only (~だけ)
select (選ぶ)	just (ただ~だけ)
pick (入念に選ぶ)	simple (単純な)
elect (選挙する)	merely (ただ~だけ)
single out (選び出す)	exclusively (全く~のみ)
opt (~のどちらかを選ぶ)	solely (ただ~だけで)
9. to show where (どこかを示す)	10. usual (いつもの)
indicate (~を指し示す)	ordinary (普通の, 通常の)
point to (とがった先にする)	everyday (毎日の)
designate (指摘する)	customary (習慣的な)
disclose (秘密などをあばく)	normal (標準の, 正常な)
denote (~を示す)	commonplace (ごく普通の, 平凡な)

started by assessing their level of word knowledge for 216 words per chapter by using the author's Dual Assessment Vocabulary Instructor-Evaluator (as described in Loucky, 2002a & 2003c) as a Receptive Pre-Test. After nine weeks of study, they were given the same Evaluator as a "Productive Posttest" to assess their learning and retention of all 1,944 TL vocabulary words. Each individual learner's scores were assessed as to these give degrees of vocabulary knowledge in three steps: 1) Self-Assessed Receptive Input vs. 2) Teacher-Assessed Productive Output; resulting in 3) Rate of Learning. This consisted of Posttest Average Percentage-Pre-test Knowledge, for each of these five areas of TL vocabulary knowledge, particularly focusing on Category C, "Ability to use TL word in a sentence." To access all 324 Semantic Field Groups, see author's website at: www.ti-ki.ne.jp/~jloucky/jloucky. Due to the emphasis of this study on acquiring words for productive use, the large volume of TL words, and the short testing time, only Category C was focused on in post-test reporting. While pre-test results are shown for all students, post-tests were only taken by those students who persevered in finishing this TOEFL/College Preparation course.

5.1. PURPOSE

This study used semantic sets of five new TL words related in meaning to a simpler Keyword to enhance L2 vocabulary development. It set out to investigate ways to help learners exposed to a "vocabulary flood" of almost two thousand more advanced words (1,944) presented. Would their prior organization and presentation in logically related semantic sets under such Keywords, along with computerized bilingual support while requiring generative processing, prove to be an efficient and effective means for them to acquire a sizable portion thereof? The following research questions were being asked.

5.2. Research Question(s):

Since the use of either High Frequency or Semantic Field Keywords learned in related groups have been shown to greatly benefit language learners by giving them thematically related reading material

that naturally provides repeated exposures to words in given disciplines or domains (Parry, 1993, 1997; Quigley, 1986), an approach that combines an emphasis on using these together with a fully bilingualized, computerized method should be much more effective than traditional learning by lists or incidental reading alone. Thus the focal research question was:

1) *Could a computerized Semantic Field Keyword Approach with bilingual glosses of target words be shown to be an effective means of helping motivated language learners to quickly increase both their receptive and productive vocabulary knowledge?*

2) A secondary related research question was: *Can this approach help students learn new vocabulary intensively, even outside of specific reading contexts, when used productively to help them generate their own utterances using TL vocabulary, or are reading contexts with supplemental vocabulary activities also essential to this method's success?* To test this area two students used only a "Pushed Output" production method of study required for all unknown words (with teacher corrections), whereas the two more advanced students did "Enhanced Productive Generation," done together with all the readings and vocabulary activities for each thematic discipline found in Crow's original text (1986a).

3) *Thirdly, do learners' initial proficiency levels affect how many words they can learn by using this approach, or can it be equally helpful to all motivated language learners in general?*

6.1. LITERATURE REVIEW: Original Design and Intent of Semantic Field Keyword Approach

Crow (1986, pp. ix-xiii) compared native speakers' vocabulary with that of most non-native English speakers and readers as follows.

A native speaker of any language has a much larger passive vocabulary than active vocabulary.

As a result, he or she can read difficult material without stopping to use a dictionary all the time. In contrast, a person who studies a foreign language, even at the advanced level, quite often has a passive vocabulary that is only a little larger than his or her active vocabulary. Therefore, the biggest single problem for the advanced student

when reading is a poor passive vocabulary... [Thus as a language learner] you need to work on building a large recognition (passive) vocabulary so that you do not have to stop after every few words to use a dictionary... you develop your passive vocabulary... [as you] learn to substitute easier words for more difficult ones as you read... No method for learning passive vocabulary works unless you read... Read anything that interests you. Read as much as possible... You will find yourself learning words more quickly than ever before... depend[ing] directly upon how hard you try.

Clearly these words and this contextualized Semantic Field Keyword Method give logical and practical advice that has been proven effective through its use with foreign students needing rapid development of their EFL vocabulary and reading skills. As a vocabulary scholar and seasoned practitioner Crow insightfully zeros in on the central need of nonnative English students to develop quick and accurate college and professional journal reading skills, based on building a better L2 vocabulary. A Keyword Group and its 4-5 related words followed by exercises is designed to reinforce a mental or semantic field association between that Keyword category and its related words. Quite simply, this approach works because it's natural and fits the way that we think as humans, as well as the way people process new vocabulary. Mental substitution of the Keyword's meaning or concept enables even lower proficiency level language learners to continue reading without as much wild guessing or dictionary usage being necessary. Although related words cannot always be substituted exactly, a Keyword meaning substitution does enable students to get enough information about its basic meaning to allow the process of reading comprehension to continue unhindered by constant frustrating interruptions.

Finally, the mutual goal of both Crow and Quigley's (1986, p. 24) text and studies was never active production, but rather rapid passive vocabulary acquisition. In Crow's own words (1986, p. xiv), "The ultimate goal is reading comprehension, not vocabulary manipulation." This proper content learning goal, as well as effective language learning processes

should always be kept in mind.

Quigley pointed out that the Audio-Lingual Approach downplayed vocabulary, so that it did not help much to improve reading ability. While the Cognitive Approach produced significantly higher scores in reading, not much testing of vocabulary acquisition itself was done. One could simply say that since the latter gave greater importance to vocabulary instruction, it yielded higher scores in reading than Audio-Lingual methods had. Although Lado did useful research, it was not translated into a solid workable approach to the teaching of vocabulary. As Quigley (1986, pp. 12-13) summarized these trends,

The research conducted from the 1950s through the 1970s focused mainly on identifying areas of acquisition and problems inherent in these areas. For example Lado (1955) identified and investigated four main areas of vocabulary acquisition: forms, meanings, distribution, and classification across languages... contrastive analysis of vocabulary... indicated that an analysis of vocabularies of source and target languages would be useful to ESL teachers. However none of this research was incorporated into a viable teaching approach.

Clearly what is important to consider, as Quigley (1986, p. 13) pointed out, is that "vocabulary practice needs to be contextualized for meaningful retention." While this is now an obvious and accepted principle, many other findings of Crow & Quigley (1986) have not yet been fully applied or realized. Most investigators today would still agree with Quigley's conclusion (p. 13) that "one's approach to vocabulary instruction must be based upon the active or passive needs of the student."

As Wesche and Paribakht noted (2000: 197) recently

Learning a word involves an ongoing elaboration of knowledge about the word and the ability to use it. Relationships are established between the word form and its semantic concepts and linguistic functions, as well as with other words that share some of these features, forming lexical networks (Hendriksen, 1999). Learning also involves automatization of word access, and, with time, the capability of producing the word in appropriate contexts (de Bot, Paribakht, &

Wesche, 1997; Hulstijn, in press; Nation, 1990). This complex outcome implies the need for repeated and diverse mental processing over time which cannot necessarily be expected from the multiple exposures obtained while reading for comprehension [i.e. incidental reading alone].

Several studies have shown that learning new words through incidental reading alone is too slow and incremental to help language learners acquire a stronger working vocabulary more rapidly. Wesche and Paribakht's (1997) study of vocabulary enhancement activities, for example, found that students using an incidental approach to reading only "acquired some words but that their knowledge of many of these words tended to stay at the recognition level" (p. 196). In the Reading Plus intentional vocabulary instruction treatment, however, students not only acquired more vocabulary, but also at higher levels during one semester, the same period of study in the present research. They concluded that

...focused vocabulary instruction based on theme-related reading texts and using a variety of techniques has shown greater effectiveness than reading comprehension alone for learning selected vocabulary... although [incidental or extensive] reading for meaning appears to produce significant results in vocabulary acquisition, such reading supplemented with specific vocabulary exercises produces greater gains for the targeted words. This suggests that although instruction makes a difference, more focused instruction is desirable when the learning period is limited and specific vocabulary learning outcomes are sought. (p. 197)

In addition, Stoller and Grabe (1993) also suggested earlier that to better enhance effects of incidental reading on vocabulary development, it would be beneficial to also use related vocabulary activities along with second language reading passages. Joe (1998) also studied the value of using generation in new vocabulary learning. She asked "What effects do text-based tasks promoting generation have on incidental vocabulary acquisition?" finding that "the process of reading and retelling a text promotes incidental vocabulary learning [although these are arguably intentional and explicit language

learning activities rather than merely implicit learning] and that generative processing enhances vocabulary learning with greater levels of generative processing leading to greater vocabulary gains for unknown words" (p. 357).

Many other studies showing the beneficial effects of using generative processing or pushed output on vocabulary learning may also be cited for support (Marks, Whittrock & Doctorow, 1974; Stahl & Fairbanks 1986; Swain 1985, 1995; and del Fuente 2002). Among these, Stahl and Clark's (1987) study showed that using a semantic mapping task along with group discussion and reading helps students to actively generate "new ways to use target words based on existing knowledge and new information enhances vocabulary learning" (Joe, 1998: 359). Taniguchi (1995), though writing in Japanese, also examined the importance of using self-generated processing for L2 vocabulary learning. She found that novice Japanese as a Second Language learners relied more on *episodic association*, or personal experiences than intermediate learners did, who instead tended to use more *systematic semantic groupings*, such as noting certain super- and subordinate relations among words. As a result, she hypothesized that L2 learners may go through similar stages, moving from more episodic memory to semantic memory. Of interest to this study is the fact that she did not have them generate Japanese sentences, but rather write words by free association, and also try to "draw semantic maps showing the relationships between the words" (p. 41). In this study, on the other hand, learners basically were learning a group of five similar or synonymous words for each Semantic Field Keyword, and generating their own sentences for them.

Jiang (2002) asked what semantic information is used in the mapping process, noting that such questions need to be more deeply researched to better understand psycholinguistic processes involved. Finally, Joe (1998: 374) found that *greater levels of generation led to greater gains for completely unknown words*, citing as support other studies which found that

Target words that were retrieved and generated during recall were learned better than words whose general properties were discussed but not

explicitly linked with the word... This supports Wittrock (1981), Baddeley (1990) and Craik and Tulving's (1975) claims that constructing semantic links of this kind leads to better memory and learning of encoded words. Tasks which encourage learners to retrieve the target form during recall and to provide an original sentence using the target word will give learners extra opportunities to practice using the word to-be-learned... An increase in word knowledge for unknown words may be attributed to greater cognitive effort due to item novelty (Loewenthal 1971; Nagy et al 1985; Shore and Durso 1990).

What types of generation are most helpful in enhancing L2 vocabulary growth is both a current and future research question, but three recent studies should be compared with the findings of this present study. Firstly, Kitajima's (2001) case study of five students of Japanese under two instructional conditions. These were an "Output Condition," in which several students initiated talking about video scenes using target words, versus a teacher-directed "Input Dominant" condition. Its goal was to examine whether "output activities facilitated the retention of words more efficiently than input-dominant activities, which require students to comprehend questions involving target words, but do not encourage them to use the words in communication" (Kitajima online Abstract, p. 1). Students retained and used more words from the "Output Condition" even 2-2 1/2 months later, showing that "output-focused activities seem to help learners encode surface-level forms into memory better than input-dominant learning activities" (p. 1).

Secondly, Morin and Goebel's (2001) study of Spanish students showed that "Semantic Mapping" was more effective for acquiring new vocabulary than not organizing new target vocabulary in this way. Although the amount or size of vocabulary learned was not more, their quality of organization, retention and recall all seem to have benefited from this practice. Semantic mapping, similar to the Semantic Field Keyword Approach used in the present study, helped novice Spanish learners to better organize and recall TL vocabulary. Learners in two groups also engaged in large and small group oral communicative

activities, but those also exposed to Semantic Mapping ranked their familiarity with new L2 terms more highly and could better group them by thematic headings.

Thirdly, de la Fuente (2002) examined the roles of negotiation and pushed output in the oral acquisition of L2 vocabulary in her study of negotiation and oral acquisition of Spanish words. Similarly, Hwang (2002) examined the effects of negotiated interaction on L2 vocabulary acquisition, comparing input versus interaction as contributory factors. His main relevant finding was that more repetitions did not improve comprehension of new word meanings or overall retention or acquisition. Rather a "Negotiated Interaction" condition did, as one would predict based on Long's (1985) interaction hypothesis. This seems to show that *not merely the quantity* (number of repeated encounters or hours of study), *but rather the quality and kind of interaction learners have with the TL vocabulary may be the most important factor in learning new words*. The findings of these studies regarding the generative use of new target language vocabulary relate to the present study in that they suggest that either type of instruction may produce similar understanding and contextual appropriateness of new word usage, and either may be effective for developing learners' receptive vocabulary knowledge. However, student-initiated output activities seem to cause students to use a larger number of new terms more productively than teacher-directed "pushed output" or input-dominant activities.

The importance of using language learning activities which encourage greater cognitive effort on the part of students is based on the general principle explained in the "Depth or Levels of Processing Theory" (Craik & Lockhart, 1972). According to this principle "the more [deeply] words are analyzed and are enriched by associations or images, the longer they will stay in the memory. Although the [Mnemonic] keyword technique seems rather bizarre at first sight, its effectiveness lies in its association of both formal and meaning elements of the new word by the use of aural and imagery clues." (Nation, 1990: 167). The most comprehensive early survey of 50 mnemonic keyword studies was done by Pressley (1982), whose conclusions are listed in Nation (1990, p. 168). The

scope of this study, however, is to explain the advantages of using the Semantic Field Keyword Approach for learners who have advanced beyond the "minimal threshold level" (as defined in Laufer, 1997), and to suggest how it may be revived and improved when both bilingual and computerized support is added to enhance it, as was done in this project.

6.2. Japanese Student's Poor English Vocabulary Knowledge: Describing and Prescribing

When one considers that only about 2,000 words are considered adequate active vocabulary for everyday conversational needs (Celcia-Murcia & Rosenweig, 1979), many ESL/EFL texts seem to stick with these only. As a result language learners in Japan, for example, even after six years of secondary instruction often average less than that when they enter college. Yamamoto (1985) found, for example, that many remembered only 40-60% of even these very limited meanings correctly. This becomes a very small foundation upon which to build SLA skills or reading fluency. Thus we must address this so-called "beginner's paradox," also known as the "threshold level or lexical plight" of low proficiency level students of English that we often find in Asia and elsewhere. In Japan these levels have not been improving (Loucky, 2003c).

But just how large a recognition or production vocabulary do our students in Japan need to have? For the past 20 years or so students in Japan have only had to study 2,000 English words throughout all of their secondary schooling. Their parents' generation, however, was required to learn 3,000 words. In order to really become more internationalized, better English vocabulary development programs need to be designed, as these are clearly one essential bridge to international study and understanding.

Indeed, there is a huge contrast between the small 2-3,000 active vocabulary with which one may survive everyday conversations in most languages, and the much larger passive or recognition vocabulary one needs for second or foreign language reading. In addition, in our modern world where the use of many forms of telecommunications such as email and faxes

requires more use of English, both receptive and productive language tasks need to be taught in a balanced way throughout one's language education. A major problem still today, as Quigley (1986, p. 15) pointed out earlier, is that despite the proliferation of vocabulary and reading texts that generally all recognize that vocabulary should be learned contextually, "students [still] have difficulty reading advanced materials because of an inadequate passive vocabulary, irrespective of the instructional material used." Another problem is that many EFL texts, including large numbers produced in Japan, give only L1 direct translations of unknown new vocabulary, with no English simpler meanings or examples at all. This unfortunate practice deprives learners of chances to learn and greatly hinders their L2 vocabulary development, which research shows (Laufer & Hadar, 1997) is best done at earlier stages bilingually, or with fully bilingualized definitions. Most ESL/EFL teachers know that inadequate vocabulary hinders a second language learner considerably in his/her ability to comprehend academic texts. This is because, as Miller (1951) found, an average native speaker can recognize about 60,000 lexical units, or over 150,000 words. To reach such a native proficiency level, Quigley pointed out, "If a foreign student were able to acquire forty lexical units a day, seven days a week, 365 days a year, he/she would still need over four years to achieve native speaker status" (p. 15). So how can we help our students expand their receptive vocabularies as rapidly as possible?

Quigley's study addressed Chastain's (1976, p. 54) similar question: "Might it not be possible and preferable to help students learn vocabulary in a second language by associating new words with known concepts?" "What is known," she writes (1986, p. 17), "is that logically ordered material [concepts including vocabulary] is easier to retain than information that is devoid of context."

Mackey (1965, p. 76) seems to have been the first to define Semantic Fields as "basic key words, which command an army of others. The semantic area may be regarded as a network of hundreds of associations, each [Key]word of which is capable of being the centre of a web of associations radiating in all directions." The author himself recommended

Mackey's method (Loucky, 1996), and that of Crow and Quigley, testing some of their material in his dissertation study of vocabulary training methods and materials. Research done in this field ever since then has clearly supported Quigley's (1986, p. 16) idea that "an approach based on semantic 'clusters' might be a more productive strategy than the vocabulary approaches now being used in most ESL classrooms." It is clear that people learn things by association according to categories, and research since the early fifties has shown the superior recall of data organized into such logical semantic categories (Bousefield, 1953). Quigley's (1986) dissertation clearly established the superiority of such a method for more rapidly and effectively building a large passive recognition vocabulary for foreign students studying at a college in Texas. It seems high time to apply these findings to the field of EFL in Asia as well.

Keywords encapsulate central concepts, and often are common simpler words that may have many other associations with related words. Children start talking by using such concrete keywords, learning and adding other grammatical constructions later. As Shepherd and Mitchell (2003, Online) wrote:

Words that have the greatest associative power may be described as **Key Words**. These are concrete, specific words which encapsulate the meaning of the surrounding sentence or sentences. They generate strong images, and are therefore easier to remember. The important ideas, the words that are most memorable and contain the essence of the sentence or paragraph are the key words. The rest of the words are associated descriptions, grammatical constructions and emphasis, and this contextual material is generally forgotten within a few seconds, though much of it will come to mind when the key word is reviewed. Because of their greater meaningful content, key words tend to 'lock up' more information in memory and are the 'keys' to recalling the associated ideas. The images they generate are richer and have more associations. They are the words that are remembered, and when recalled, they 'unlock' the meaning again.

Quigley's chief conclusions and recommendations to consider for further application included both

positive student reaction and also three positive measures of improved performance. Quigley's second principle was that "Long-term retention (of twice as many words) is at least as good for the keyword approach [SFKA] as it is for a more traditional approach [learning only half as many words!]" Any objective outside observer would have to be amazed, however, that the vocabulary learning burden of the SFKA Treatment Group in this case was twice that of the traditional Control Group. Clearly despite not having a level playing field, those foreign students made accountable for double exposure to twice as many unknown words did just as well on a 4 week long-term memory retention measure, and did significantly better on a long-term test of retention a full 4 months later! Thus, this original Semantic Field Keyword Approach needs to be understood and appreciated in its original context, as it holds great promise for both FL and SL vocabulary instruction and learning.

Quigley's first conclusion (1986) in this context takes on far greater significance. She found that "Twice as many words can be covered in a given period of time with the [SFKA] keyword approach as can be covered using a more traditional approach (as defined in this study)" (p. 44). She explains her findings quite simply and modestly in just one paragraph as follows.

The keyword method [SFKA], utilizing a semantic field approach to the teaching of passive vocabulary, is not magic. Experimental subjects were unable to learn twice as many words in the same amount of time as those using the traditional approach without having some short-range disadvantages in the testing situation [naturally to be expected, given twice the vocabulary learning load!] However, this disadvantage seems to disappear on long-range testing [in this case after 4 months]. Thus, the overall results of this study lend support to the theory that a semantic field approach is a more effective and efficient builder of passive vocabulary. (p. 44)

Quigley's third finding and conclusion (pp. 43-44) was: "The [Semantic Field or SFKA] keyword approach is a more effective builder of passive vocabulary than unstructured random exposure to

academic English.” Finally, current and future vocabulary researchers should carefully examine and test Quigley’s recommendations, the first of which asked: “1. Although the approach seems to be superior with four units, would proactive and retroactive interference inhibit learning if more units were attempted?” (p. 44)

In response to this idea one must indeed consider and beware of both “cognitive overload” and also “vocabulary density overload.” By this is meant both an overload of too many unknown terms per running words (see Loucky, 1994; Nation & Newton, 1997), too dense or complex a text, or too much complex vocabulary at too high a grade level for ESL or EFL students to handle. In other words, pushing too many words or texts that are above a student’s normal individual “Instructional or Independent Level.” “Cognitive overload” or “Frustration Level” commonly means more than 1-2 grade levels above an individual or group’s average reading level (See Ekwall, 1976 for fuller explanations of these terms). Obviously effective SL/FL reading teachers must know enough to avoid using texts or contextualized word lists that are at a Frustration Level since they will be too demanding or overwhelming for the student. This is even more important a consideration when teaching non-cognate languages, since anxiety and frustration levels would naturally tend to be higher the greater the dissimilarity of languages.

Pedagogical principles to keep in mind to avoid “Foreign language reading anxiety,” as Saito, Garza, and Horwitz (1999, pp. 216-1-217) recommend from their study thereof, are:

Additional specific teaching measures might be necessary for noncognate languages such as Japanese [or for Japanese learning English]. As current trends in teaching language tend to focus on the development of oral proficiency, in a noncognate language, especially, teachers cannot assume that reading proficiency automatically follows the development of oral proficiency, and more instructional effort must be given to teaching target language literacy explicitly. Teachers may be able to help their students by: a) acknowledging the unique characteristics and features of their target language; b) carefully

selecting authentic materials to demonstrate how students can use the vocabulary and structures they have been studying; c) bringing students into discussions of the language learning and reading process, ensuring that teaching goals are appropriate and attainable, and helping students recognize that they can be successful, d) pacing the course so that students are challenged but not faced with a cognitive overload; e) teaching successful learning and reading strategies; and f) devoting more class time to prereading activities and assessment of reading objectives.

Two of Quigley’s recommendations (p. 45) apply to the area of this method’s possible effects on improving reading comprehension, which certainly should be studied in the future. These are: “2. Would the keyword method [SFKA] produce significant effects in the reading comprehension process per se?” [and] “3. What would happen if the disadvantages to the experimental groups inherent in this study were removed? Research testing reading comprehension rather than vocabulary retention might allow for this.”

Indeed testing of the Semantic Field Keyword Approach’s degree of effectiveness and possible influence on improving FL or SL reading comprehension are worthy areas of study where these findings should be applied. There should be such a relationship, since it is well known that as vocabulary levels are improved, comprehension levels also generally rise accordingly. Just how much more effective a Semantic Field Keyword Approach might be to enhancing SL/FL reading comprehension was fascinating to contemplate, but harder to enunciate until it had been tried. Clearly it had to be tried to be fully appreciated and thus this study was done.

Quigley’s final recommendation asks: “4. Is there a more effective way of teaching vocabulary by semantic field associations than that employed in this study?” This study aims to examine whether such a more effective way would be to combine the effective use of Vocabulary Knowledge Scales such as the Dual Assessment Vocabulary Instructor-Evaluator recommended above (from Loucky, 2002a, 2003c) with this proven Semantic Field method. Simultaneously students should be taught to use more efficient computerized tools, (including portable computerized

bilingual(-ized) dictionaries (CBDs) and instant access online glossing), along with more effective vocabulary learning steps, skills and strategies. In this way we may discover a far more effective way of teaching and learning FL/SL vocabulary. Surely a combination of these systematic methods, combined with using many excellent computerized tools which modern technology has made available for the benefit of language learners, along with creativity and hard work can help us to solve the "Polyglot Puzzle" to assist language learners everywhere in the challenging task of making SLVA more rapid, easy, enjoyable and effective.

Logical steps of application of Quigley's findings, which this researcher is attempting to follow are to apply them in this manner. The first priority should be given to helping language learners improve their vocabulary learning strategies (VLS), including by the use of more computerized tools--such as CALL software and translation/reading/vocabulary websites--in order to help them develop their foreign language and reading skills in the following three areas: 1) First help them to quickly build up a better "Recognition or Understanding Vocabulary," as well as improve their L2 learning rates; 2) Second, improve their "Productive Use Vocabulary;" and 3) Thirdly, improve their FL reading comprehension levels. Although a tall order, taken together this research plan seems like a very workable solution, one which could certainly help to clear the "lexical maze or quagmire" which most ESL/EFL students seem to face.

7.1. Procedure: Applying the Semantic Field Keyword Approach in Japan

Keeping in mind these excellent pedagogical principles, and a correct understanding of the Semantic Field Keyword Approach as demonstrated in the work of Crow and Quigley, several smaller TOEIC and TOEFL classes of Japanese women's junior college English majors were given lessons using it. These were first designed based on the History chapter of Crow's textbook, five lessons of which were put on MacIntosh's *Hypercard*. In a 2001 Pilot Study five TOEFL 2nd year students learned 180 History words with this approach (from Crow's Chapter 2). Results showed it to be a relatively effective method for them, although their low vocabulary level (averaging grade

3.2) clearly interfered with maximum learning possible. They averaged 63% on a posttest of productive use of these words. Although there was not time to give a receptive test, since recognition is easier than recall, they would probably have done better on one.

Students in this 2001 pilot study gave a positive evaluation of this method, saying such things as the following: 1) I most liked SFKA. I found I had to study much harder because I didn't know many words or phrases. 2) I didn't study much. I learned how to develop and improve my language and vocabulary. I need more effort and review, although I enjoyed studying English a lot in this class. 3) We learned many SFKA words with similar or opposite meanings together. 4) We learned how to improve vocabulary using related Semantic Field Keywords. I have to study root words, prefixes and suffixes, and parts of speech more, also learning to connect new words to some situation in my mind. 5) Word association by SFKA is very helpful way to build vocabulary.

In pilot tests comparing the relative effectiveness using teacher-made *Hypercard* CAI vocabulary lessons for learning twelve sets of Related Keyword Groups with learning a different set of twelve groups by using a text-based approach, results were limited and inconclusive. Thus this more complete "Double Your Vocabulary by Keywords" website and longitudinal study were designed to test and compare the effectiveness of a Semantic Field Keyword Approach for Japanese college EFL students and Japanese-American ESL students. Students could use any kind of computerized portable dictionary as well, though all words were presented with bilingual glosses both at the website and on floppy disc Word files.

In addition, while the original approach was designed only for textbook use, language learners in this study has also had the added benefits of using a fully bilingualized and computerized approach, since the writer put all of the target words, pre-organized by academic discipline and related word groups onto both his Website and floppy discs, making these and electronic computerized bilingual dictionaries available to each of these students as well. Using a combination of these computerized tools with a Semantic Field Keyword Approach that stressed regular productive use of new target words (one

Table 2: Pre-Instructional Self-Reported Receptive Knowledge of Science Chapter Words

Total # words	By DAVIE	Vocabulary	Knowledge	Scale	
SFKA Words 216 per Chapter	A	B	C	D	E
Chapter 1: Science	Japanese Translation	English Definition	L2 Sentence	Meaning not Clear	Not Known
STUDENTS & VL	Self-Report %s:				
1 K-san 5.3	43.83	47.22	45.83	20.83	30.55
2 Mo-san 3.1	31	6	15	17	52
3 Mi-san 4.4	33.33	10.18	17.59	16.2	50.46
4 Fu-san 4.4	46	9	42	20	33
5 Sa-san 4.2	31	0	13	17	52
6 Ka-san 2.7	12	0	12	27.3	60.6
7 Ma-san 3.5	44	0	25	40	132
8 Me-san * 9.5	75.61	89.81	78.7	9.72	0.462
9 Go-san * 10.2	58.33	75.46	62.03	20.83	0.4629
10 MR-san 4.3	50	25	17	22	27
AVERAGES:	42.5	26.27	32.82	21.09	43.85
Ave. Voc. 5.16	Jr. Col. 4.0 Ave.				Jr. Col.

V.L.= Vocabulary Level, based on U.S. Test Norms

chapter's words assigned per week) seem to have been most effective in helping these students to acquire a large number of new terms. In fact, the average number of new words for which they could generate grammatically correct sentences was quite sizable, almost 500 (498) new words per student. This is quite an important finding about the great usefulness of this innovative way to use the Semantic Field Keyword Approach, since most students in Japan have long lacked effective ways to quickly improve their vocabulary to more advanced levels (see Loucky, 1996; 1997a & b; 1998; 2002c & 2003c).

7.2. Detailed Longitudinal SFKA Study

A more thorough study was then done, using all 216 Keyword-Related Groups, which one small, six-member TOEFL class of second year English majors at a women's junior college was challenged to learn over their two-month long summer vacation. In addition, for purposes of comparing this method with a slightly more diverse population, one Japanese recent graduate of an English junior college, and two Japanese-American teenage girls were also included in the study. First their individual knowledge of all 216 words presented in each chapter was assessed. Then after summer study, their self-assessments using this researcher's Dual Assessment Vocabulary Instructor-

Evaluator were compared with what learners could actually produce on the same Evaluator for each of these nine chapters. To reduce the possible effects of either excessive cramming or test overload, 432 words from only two randomly chosen chapters were tested each week, with only one chapter done in the first week's explanatory lesson. After one semester of study students' responses were checked to see what kind of long-term learning and retention they would have after studying the words on their own and with teacher correction of sentences they generated for any new words. Results for this more complete and thorough investigation of Crow and Quigley's Semantic Field Keyword Approach, when using a "pushed output" productive format are shown in Section 8.1 and in Tables 1-4.

As one can see from Table 2 below (further tables appear at the end), eight junior college students who began the TOEFL course had an average vocabulary level equal to that of beginning 4th graders in America. This table also shows total averages for all students' pre-instructional self-reported receptive knowledge for all 216 Semantic Field Keyword Groups (x 9 Chapters= 1,944 Words). But when levels of the two Japanese-American teenagers (who began at an average 9.85 grade level) are averaged, the whole group's average would rise to grade 5.16. These

Table 3: Post-test Evaluation of Semantic Field Words Learned by Productive Use

Chapter:	1	2	3	4	5	6	7	8	9	Total Ave.#	STUDENTS:
%Learned										Jr. College	TOEFL Class
S-san	66	88	81	42	42	60	70	50	50	546	S-san
Ma-san	30	21	81	65	63	75	73	47	65	520	Ma-san
											Home-schoolers
Me-san	21	57	47	43	37	63	59	32	26	385	Me-san
Go-san	46	79	71	60	60	65	56	44	60	541	Go-san
										498	Average # Learned

Table 4: Total TL Vocabulary Assessed by Type of Vocabulary Knowledge Using DAVIE Self-Reports (for 216 Semantic Field Keyword Groups x 9 Chapters= 1,944 words)

Subject:	A	B	C	D	E
Chapter 9: Economics	42.759	26.143	32.753	28.035	48.4782
Chapter 8: Sociology	38.28778	19.82556	27.17	26.37222	43.86467
Chapter 7: Geology	40.261	22.73033	29.587	24.48722	45.9178
Chapter 6: U.S. Government	38.18186	23.82206	31.49478	24.86191	37.2361
Chapter 5: Biology	37.65531	25.45877	30.67111	25.24938	38.5603
Chapter 4: Anthropology	39.23107	28.10566	32.17053	26.7896	35.47542
Chapter 3: Psychology	42.49277	30.93441	35.57843	25.38397	33.79323
Chapter 2: History	43.96289	34.05726	37.26405	25.4717	32.62383
Chapter 1: Scientific Experimentation	42.04875	29.05887	34.06721	26.13215	35.8653
Total Average %s Surveys	40.54227	26.68177	32.30623	25.8648	39.09054
Chapter & Academic Discipline:	A Can give Japanese Translation	B Can give English Definition	C Can Use in L2 Sentence	D Meaning not Clear	E Word Not Known

two groups were kept distinct, however, having very different educational and linguistic backgrounds, as the latter two students live in a bilingual home.

Although only two of the Japanese junior college students continued into the 2nd semester of this course, completing their Keyword study, one recent junior college Japanese student bound for study abroad and these two Japanese-American high school students (the three being cousins) also took the Keyword study. The following Table first tells each student's pre-instructional self-reported receptive knowledge of 216 Semantic Field Keyword Groups out of a total TL vocabulary assessed of 1,944 words from nine different discipline areas. Their averages for each level of vocabulary knowledge were 42.5% for A. Japanese Translations; 26.27 for B. English Definitions; 32.82% for C. Category words for which they could supply a meaningful sentence with that target word; 21.09% of the words were "Unclear," and lastly 43.85 of all words were reportedly "Unknown." From pre- to posttest, sample size went from 10 down to 4 students, since not many junior college students were

motivated enough to continue with a TOEFL course.

Table 2 then gives the number of target words learned both individually and as a group average from each Related Semantic Field Keyword Group. The number of words learned for each chapter are shown at the bottom under each respective discipline area. All junior college students studied one chapter of Semantic Field Keywords per week, using these bilingual lists employing this computerized "pushed output" approach to produce their own sentences for all new target words. The two Japanese-American teenagers, on the other hand, also did both Extensive Reading of related articles and recycling activities with vocabulary from each Semantic Field Keyword Group within every chapter, as well as generating their own sentences for new words. Among the portable devices they used was the monolingual Oxford's *Wordpower Dictionary Genie* software with its collocation *Phrase-builder* included. Their reaction was that "*Genie's* helpful but doesn't always have words you're looking for. Electronic CBD is easy to use, fast, and portable so I prefer studying with it. *Genie* gives me the

English meaning and sometimes includes examples, so it's a useful dictionary while using the computer." (For data on *Genie* see Oxford's Website at: <http://www.oup.com/elt/global/products/multimediasupport/help2/> . To examine types of computerized software, translation websites, and electronic portable dictionaries available to these students in Japan, see Loucky, 2002a, b & c; 2003a, b, d & e).

Table 3 ("Post-test Evaluation of Semantic Field Words Learned by Productive Use") shows the number of words learned by each student per chapter, as well as the total average number learned (498 words) for all students who completed this course of study. On the other hand, Table 4 ("Total TL Vocabulary Assessed by Type of Vocabulary Knowledge Using DAVIE Self-Reports") shows these same students' responses to the Dual Assessment Vocabulary Instructor-Evaluator (Loucky, 2002a & 2003c), giving the average percent of words believed known for each of its five categories of knowledge. Although sentences generated by Japanese college EFL students versus Japanese-American high school home-schoolers were less complex and comprehensive, all grammatically correct sentences were accepted on the productive post-test.

7.3. Individual Learner Profiles:

Typical answers for each student (using pseudonyms) will be given to show their relative level of writing proficiency in using target vocabulary productively. 1) S-san—She has only visited New Zealand for two weeks, but enamored by it plans to study there from the fall of 2003. Her vocabulary and grammar are weak, but her comprehension is good, and in half a year of study her vocabulary went from 4.2 to 4.6 grade level. At the end of this TOEFL and Semantic Field Keyword study her comprehension level was 4.2, and her total reading level 4.1. She used generally simpler sentences, such as "Can I depend on, rely on, lean on, count on, bank on, or put faith in you?" Such sentences helped in learning common collocations. She tended to omit or confuse articles 'a or the' when needed, though, as Japanese does not use any. Teacher correction and assistance was required.

2) Ma-san—Although she spent about five years living as a child in Singapore, she attended Japanese

schools there, so her vocabulary and grammar are still rather weak. She plans to study in an American college from the fall of 2003. Her vocabulary increased from grade 3.5 to grade 4 in half a year. Her comprehension skills are low, at grade 3.3, resulting in an overall reading level of only grade 3 despite this training. She does not appear to have a high level of language aptitude, despite living overseas long-term. Teacher assistance required.

3) MR-san—Typical of many Japanese junior college graduates who want to study abroad, she had majored in English for two years in Tokyo at a women's junior college, as students #1 & 2 were doing. Like them she also aimed to study overseas. Her English level was similar to that of student #1, but she had more motivation to communicate, having relatives who are Japanese-American or Americans, with whom she desires to be better able to speak. She completed most of the chapters with composite sentences such as "Factory makes products, ware, goods, merchandise, or produce." MR-san had similar problems to other junior college students with proper article use, also confusing nouns and adjective forms, or verb and noun forms. She also often used forms like "Can you...? or Do you have...?" Target words used as incorrect parts of speech were marked wrong. Teacher correction and assistance was required.

4) Go-san—As a Japanese-American, she grew up in Japan attending Japanese elementary school. She has completed 3 years of mostly English-based junior high home-schooling courses. Her vocabulary and reading levels have increased about two grade levels during the first 1½ years of high school, going from 10th to 12th grade level. She plans to study in an American college from the fall of 2005. As an independent language learner, she could make very complex, native-like sentences consistently, such as "I was ascribed, imputed, or accredited glory for my work." Go-san often combined related words from each Semantic Field Group into these kinds of sentences to learn and remember new words more efficiently.

5) Me-san—As a Japanese-American, she grew up in Japan attending Japanese elementary school. She has completed 4 years of mostly English-based junior high and first year high school home-schooling

courses. Her vocabulary and reading levels have increased over two grade levels during the second year of high school, going from 9.5 to 12th grade level. She plans to study in an American college from the 9/2004. Me-san generally did not combine related words into sentences to learn them, making sentences such as "The [A] symbiotic relationship existed between church and state." Also a self-starter, after these lessons she began to see the importance of improving her vocabulary actively, downloading numerous vocabulary and SAT programs in preparation for American college entrance exams, finding many excellent free sites. She learned less TL words mainly because she knew more of them to start with than other learners did.

These last two Japanese-American high school students doing Home-schooling in Japan were included to get a better comparison of students at closer to native language proficiency level. Although their grammar and vocabulary use was much more rich and complex than Japanese junior college students, all students learned about an equal amount of new words, close to 500 (averaging 498) using this SFKA method.

Thus it proved to be equally effective in terms of building better vocabulary breadth or size for both groups of students, although quality or depth of vocabulary was clearly much more well-elaborated and enriched by the two higher proficiency Japanese-American high school students. They could consistently generate L2 sentences using new target language vocabulary with 90-95% accuracy, further demonstrating that their L2 independent reading and writing skills are at high, near-native level already, although they had had only 3-4 years of full-time English language schooling up to that point.

8.1. General Results:

One can see by comparing the responses and resulting learning of these students that not only are the depth of lexical processing and number of strategies used important, but equally important are the quality and consistency with which these steps and strategies are used. These findings support earlier studies (Kojic-Sabo & Lightbown, 1998; Sanaoui, 1992, 1995), which have indicated that students who are more structured and consistent in their vocabulary

learning habits tend to be more rapid in their acquisition, resulting in such learners reaching higher levels of proficiency more rapidly than other students who are less well-structured and disciplined.

Clearly using both the double benefits of rapid-access CBDs or instant access online to monitor and check on word meanings along with this Semantic Field Keyword Approach helped our students to learn words more effectively. Limited tests of this method so far by the author have strongly supported Quigley's (1986) findings, that a Semantic Field Keywords Approach can be particularly effective for more highly motivated upper intermediate to advanced learners of English, as shown by both subjective student responses of increased satisfaction and confidence in their ability to use the TL and also by objective empirical results. Although semantic mapping of whole texts is a technique commonly used to aid in seeing the whole picture better to enhance readers' comprehension, this study shows how L2 vocabulary acquisition can be enhanced by teaching semantic sets together to students who are intermediate or above.

8.2. Results in Terms of Specific Vocabulary Learning Strategies and Processing Steps Used

A sharp contrast was seen when these learners were asked which of eight basic vocabulary learning steps they used and how. The TOEFL junior college students reported using only 1-2 of these steps, whereas the Japanese-American high school students used 5-6 steps. Specifically, Sa-san only looked up or accessed unknown words with an electronic dictionary, but did not recognize or regularly use any of the other important processes. Ma-san used only the first two steps, assessing known versus unknown words, and accessing or looking up new word meanings with her bilingualized electronic dictionary.

On the other hand, the two Japanese-American high school students used the following vocabulary learning steps and strategies. Me-san used 5 out of 8 steps, omitting only formally assessing, recording and associating or organizing words in any particular way. She told how she used these five steps, saying that she accessed by use of an electronic dictionary, analyzed by word usage, activated by using new words when

writing, anchored them using pictures or sentences, and reviewed by going over new words with flashcards or in her notebook, and re-checked them with her electronic dictionary's history or memory search function. Later on a more detailed survey of forty Vocabulary Learning Strategies (VLS), however, she said she uses 9/40 or 22.5% of them, including marking words for study, saving words on both cards and computer, building mental links, and trying to review and recall new words and use them in her writing. Go-san reported often using 6 out of 8 of these essential steps, omitting only organizing and anchoring. She implements these six vocabulary learning steps in the following ways. First, she assesses new words by "seeing if there are words I know and [attend to or] think of the meanings." Secondly, she accesses new meanings by using a book or electronic dictionary, including a *Quickionary* Reading Pen at times. Thirdly, she archives by "recording on cards or in notebook." Fourthly, she analyzes the parts of words. Fifthly, she activates by writing essays and reports required in her home-schooling courses. Sixthly, she reviews her cards or notebook. Later on a survey of forty VLS, however, she said she uses 24/40 or 60% of them, including organizing words alphabetically. She also chose three means for anchoring or fixing new word meanings and forms in her memory given on that survey, namely 1) using pictures or hints, 2) using similar sounds, and 3) building mental hooks or links. Both of these girls preferred discovering and consolidating new word meanings alone, as reported by most Japanese college students as well.

The junior college students who completed this study raised their vocabulary levels by an average of about a half (.45) grade level; whereas the Japanese-American home-schoolers each increased their levels in the same amount of time by about 2 grade levels. Reasons for far greater progress made by these Japanese-American students include the following: 1) They started at a much higher level, having made the transition to mostly English education at the start of junior high school, 2) They spent two months summer vacations in the States last summer and three years previously, and 3) They followed a "Pushed Output Plus Extensive Readings" program including

vocabulary recycling activities, completing the entire Crow (1985) textbook besides. This combination of factors appears to have been most highly effective. That is to say, starting with word study elaborated by computer-enhanced "Pushed Productive Output" receptive readings followed by target vocabulary recycling and Semantic Field grouping activities proved to be most beneficial in raising these students' vocabulary and reading levels. They have also had the strong dual instrumental and integrative motivations of visiting the US for summer vacations and future college study.

9. Discussion:

The effectiveness of using this Semantic Field Keyword Approach for both more limited proficiency intermediate EFL students as well as more advanced Japanese-American learners lends strong support to the insights of electronic corpora and cognitive psychology research. Both of these now point to the fact that "a great deal of language activity involves the manipulation of pre-assembled, more or less fixed groups of words" (Rundell, 1998: 324). In this study these fixed word groups were related by being within the same Semantic Field, arranged under common simpler synonymous Keywords.

In the present study, both the Productive Practice Only group and the Productive Practice Plus Reading with Exercises group were encouraged mainly to help students focus on learning as many unknown vocabulary words as possible during three months of study. While learning such a large volume of more advanced vocabulary proved to be rather challenging to these students, those four (out of an original ten) who chose to continue their study were all more motivated by specific plans to study overseas in the future. These students all demonstrated that they had learned how to productively use an average of 498 of these new advanced words, all related by Semantic Field Keyword Groups (of five similar words or synonyms per Keyword). Learning such a sizable number of advanced words within such a short time reflects both the degree of motivation of these students as well as the effectiveness of this Keyword approach, both for intermediate level junior college EFL students as well

as for ESL high school students.

10. Conclusions

Normally we would expect individual student factors--such as degree of background knowledge, prior proficiency level, and degree of elaboration through vocabulary study, exercises and generation--to largely determine the vocabulary gains made by each one. In this case, however, gains were quite similar in quantity, although the more proficient learners naturally used far more sophisticated and complex sentences at near-native proficiency level. Lower proficiency students had much more rudimentary sentence structure, made some mistakes in use of articles and objects, and were more likely to confuse a target word's part of speech. Nevertheless this bilingually, computer-enhanced Semantic Field Keyword Approach proved to be very effective in helping all of the learners to gain productive use of a sizable data bank of new vocabulary words, averaging 498 each in only a few months of study. When one examines the difficulty of words they studied this is a welcome and important finding about a most promising method to use for more rapid learning of general and academic vocabulary.

The main findings concerning generation and vocabulary learning are these:

1. Generative processing appears to enhance vocabulary learning, consistent with Joe's findings, (1998: 375) "with higher levels of generation producing greater gains for previously unknown words." Our students' learning results under a "pushed output" condition were also consistent with her finding that a better "quality of vocabulary use, or a higher level of generation, appears to have had a more powerful effect on [their] vocabulary acquisition" (Joe, 1995: 149).
2. Greater use and retrieval of the Semantic Field Keyword during recall and productive use seems to strengthen both the learning pathway as well as memory retention traces.
3. With respect to our research questions the following may be said:
 - a. A computerized Semantic Field Keyword Approach with bilingual glosses of target words,

when accompanied by some form of required "pushed output" seems to be quite effective as a means of helping motivated language learners to quickly increase both their receptive and productive vocabulary knowledge.

b. This approach helps students learn new vocabulary intensively, even outside of specific reading contexts, when used productively to help them generate their own utterances using TL vocabulary. Reading contexts with supplemental vocabulary activities, while helpful, do not seem to be essential to this method's success. An Intensive Reading vocabulary development program that incorporates such a "Pushed Output" Production (POP) method of study with unknown words could be most effective. But even students using a more free Extensive Reading approach can benefit greatly if teachers can help them to focus on target vocabulary by using supplementary activities that encourage generative use thereof.

c. Learners' initial proficiency levels did not seem to affect change in vocabulary size or breadth (how many words they could learn by using this approach), as much as change in vocabulary quality (depth and degree of organization). Thus such an approach may prove to be equally helpful to all motivated language learners in general. These areas could well be studied with far more students in greater depth with many potential benefits to them as well as further contributions to this field of SLVA research.

11. Pedagogical Implications

As seen from the results of this small-scale study, using a CALL-enhanced Semantic Field Keyword Approach consistently can especially help both upper-intermediate and higher proficiency, academically motivated language learners. It also gives intermediate level learners a better way to organize and guide their own vocabulary development, particularly when combined with the use of a vocabulary learning strategies taxonomy such as that suggested by Schmitt (1997) and Kudo (1999), which helps to encourage students to process new TL vocabulary more thoroughly as well as at deeper cognitive levels. As shown by Crow

and Quigley (1986) in their original studies, this system seems to be able to better guide and inspire more advanced students, especially giving more hope to learners who previously lacked a clear direction or system for better organizing their lexical development.

Since learners tend to generate and organize language based on their own personal experiences and the degree of cognitive complexity within their own L1 and L2 mental lexicons, teaching implications are as follows. Firstly, these results support Taniguchi's (1995: 43) recommendation that "beginners should be encouraged to talk about their experiences more often [the Language Experience Approach], and to be provided chances to sort out their learned vocabulary in their own ways, using semantic maps or categorizations." Learners need to be encouraged to experiment freely and frequently with new language forms and meanings orally as well as in their writing, and be given feedback later on, in order to encourage maximum generation without hesitation or fear of failure or over-correction.

Since much of what we really remember is based on our own personal experiences and episodic memory, language learners need to be encouraged and guided in doing far more activation and elaboration activities. When students are guided to systematically personalize and extend the core vocabulary and language forms they are studying in various ways, such language learning tasks and activities help to significantly raise their rate of vocabulary learning and retention, thus increasing the effectiveness and depth of their language acquisition.

As Gatton's *DynEd* (2002, Demo CD) program points out, "True mastery of a language at any level, is greatly affected by the level of opportunity students have to practice, particularly with other speakers." Language learners need to first learn basic, common core vocabulary, which in English means the 2,000 General Service List (West, 1953) words. Second, they need to learn those of the Academic Word List (Coxhead, 1998, 2000), and third, develop greater lexical breadth and depth by systematically using a bilingual, computerized Semantic Field Keyword Approach to most rapidly expand their receptive vocabulary, while building up their productive vocabulary by practicing and using newly acquired terms in

their own written and verbal expressions as much as possible. Although the quality and complexity of their writing and oral utterances will differ according to their level of overall language maturity, following these logical steps will undoubtedly help them to build up their L2 lexical and language proficiency.

Language learning is accomplished by a wide variety of means. But it is becoming increasingly clear that deeper lexical and cognitive processing of new TL vocabulary and more active use thereof in a wider range of different contexts using a variety of ICALL and multimedia tools will help build L2 vocabulary and language skills much more rapidly when such tools are used following such an effective system, which integrates all four communication skills as well as possible.

An online program which is similar to *Rikai.com*, which aids in Japanese learning via the use of interactive Kanji Maps, needs to be developed for more advanced English vocabulary development as well (e.g. Hill's online attempts at <http://ec.hku.hk/mmhill/Vocabulary.htm>). Such an interactive program would greatly benefit from using the insights and principles of this Semantic Field Keyword Approach, and should include more advanced common core academic word banks, such as these: 1) from Crow's text, 2) from JACET EAP Lists, 3) ICU's Recommended EAP List (See Mizoguchi, et al., 1995), or 4) Coxhead's Academic Word List (1998, 2000). Such lists of essential and common core vocabulary can help to better guide any language teachers and textbook writers in constructing better texts and a richer English curriculum. Certainly establishing meaning priorities for word lists is a fundamental principle in EFL Pedagogy, and more concentrated attention needs to be focused upon the types of words and meanings which are most useful and needed by EFL learners. Improved use of Vocabulary Knowledge Scales (VKS) and computerized bilingual/ized dictionaries (CBDs) of all types can help to quicken, expand and enrich L2 vocabulary learning in Japan from as young an age as possible (Loucky, 2002a, b, c; 2003, a, b, c, d, e).

Theories in a vacuum are inadequate. As Quigley contends, "To understand the significance of learning passive vocabulary, one must look at the role it plays

in the reading process.” So too to understand the significance of building learners’ productive vocabulary one should look at the role it plays in developing their L2 listening, reading, speaking and writing abilities. Distinguishing between and helping students to develop both their receptive and productive vocabularies are areas where a greater use of Vocabulary Knowledge Scale instruments and computerized technologies can greatly help.

12. Use and Evaluation of Computerized Vocabulary and Reading Programs

Consistent use of taxonomies of vocabulary learning strategies, such as that proposed by Schmitt (1997), and systems that encourage both greater a) depth of lexical processing, b) a wider breadth of syntactic complexity, and c) repeated encounters with new TL forms and meanings in as many different contexts as possible should be encouraged, and can often be greatly facilitated by the rapid access provided by CALL dictionaries and translation software and websites (Loucky, 2002a, b; 2003a, b, d, e). Helping students to develop consistent computer-assisted habits of systematically and organizing their processing of new lexis can probably best help them to maximize their TL vocabulary development.

Both vocabulary and comprehension components should be evaluated, while giving learners maximum opportunities for more integrated language skill development. Better balanced and holistic language development can be encouraged both by giving students more individualized CALL interaction through multimedia formats, as well as by providing social language learning experiences in which students are asked to apply new learning more productively. This study clearly supports findings of Joe (1995; 1998) that showed that one of the types of learning behaviors strongly helping to promote L2 vocabulary acquisition undoubtedly is *generation*, even when required of students by a “Pushed Output Production” condition, as recommended by Swain (1985; 1995) and de la Fuentes (2002) studies as well. Vocabulary learning activities that promote *attention* (such as using VKS assessment), *recall or retrieval*, and also *generative use* in original, creative ways by students

can surely help to foster better vocabulary acquisition.

13. Future Research Recommendations for Vocabulary Study, Teaching and Research

The following important questions should be addressed by more vocabulary researchers:

- 1) What kind of word grouping or “chunking” can help facilitate better long-term retention of new TL vocabulary? In particular, are words learned in related Semantic Field groups better retained than those that are not? This study does lend support to the well-known principle that better-organized knowledge is easier to learn and retained longer.
- 2) Specifically, can words grouped and learned together in Semantic Field units under simpler “Keywords” to which they are all similar in meaning promote long-term retention for all language learners, or only for those of higher proficiency, say above the commonly known “minimum threshold level” (MTL) (See Laufer, 1997) of 3,000 word families?
- 3) Although trying to teach too many related words at early language learning stages should be avoided due to potential problems with cognitive overload or interference as mentioned above, at what language proficiency level do newly learned groups of related words become easier to recall than unrelated word meanings? Does the “Minimum Threshold Level” of headwords hypothesis hold true here? Is potential interference reduced or eliminated when new TL vocabulary words are learned in Semantic Field sets with fully bilingualized glosses, as opposed to only monolingual glosses, which assume or require a higher level of native-like reading and vocabulary proficiency?
- 4) Assuming this method is more effective for motivated language learners, such as the more advanced foreign exchange students using the method in Quigleys original study (1985), can its use be maximized or made more effective for both a) Receptive and b) Productive vocabulary development, by means of both bilingualized

and computerized immediate access glossing (CIAG) and other such recent CALL innovations? Are there any other superior ways to present words, such as in semantic sets, thematic sets, combined with pictures or social retelling activities which students construct, rather than just giving students new word meanings without requiring any mental effort or negotiation of meanings on their part? Can an ICALL Web-based approach be designed to help learners further extend their vocabularies more naturally and rapidly, like spiders build up their webs so beautifully and systematically? Recent studies in ICALL suggest that it can be done with better, more systematic integration of SLVA and ICALL components if we use an effective "Depth of Lexical Processing Model of SLVA" coupled with a consistent VLS Taxonomy (Schmitt, 1997; Segler et al, 2000; Coll, 2002; Loucky, 2002a, Saunders, 2002).

- 5) Finally, can this method be even more enhanced when used to organize all L2 vocabulary learning into both topical and semantic sets, and used as just one step in a more systematic model or "Taxonomy of Deeper Lexical Processing?" How much can the use of such a regular system requiring deeper lexical processing help language learners at differing proficiency levels? Are audio-visual cues more effective when constructed by learners themselves in social groups, rather than either alone, or when given by a teacher or provided by a machine?

Lest we misrepresent the nature of L2 lexicon development, each aspect of lexical development needs to be studied and analyzed more carefully, combining the use of various assessment instruments which can help us obtain more accurate views of the mind and mental lexicons of language learners in the daunting task of foreign language vocabulary acquisition. Several instruments have been tested and developed by this researcher, which seem to be needed in order to render a better individual learner profile, as well as more accurate diagnosis of their reading needs, necessary for more appropriate prescription of effective instructional methods and materials in second language reading and vocabulary development.

Besides the 1) Dual Assessment Vocabulary Instructor-Evaluator used in this study these include 2) a systematic Vocabulary Learning Strategies Taxonomy, 3) an Approach to Vocabulary Learning Questionnaire based on Lessard-Clouston's 1998 & 2000 studies (AVQ), 4) Surveys of vocabulary learning strategies based on Schmitt's taxonomy thereof (1997), and 5) an individual Lexical Learning Interview Checklist based on a Depth of Lexical Processing Scale (described in Loucky, 2002a). Use of the latter can especially help us to see how deeply students are actually processing new target terms, and where better use of ICALL could be more effectively employed to aid foreign language learners in improving both receptive and productive vocabulary in their target language. *Especially a completely integrated ICALL system that provides learners with fully bilingualized, automatically cross-referencing computerized dictionaries with immediate access glossing, archiving and printing functions available at each step of lexical processing and producing should prove to be among the most effective ways ever found to help foster rapid L2 lexical acquisition and foreign language development* (Loucky, 2002b, 2003a, 2003b, 2003d, 2003e).

Since there certainly are encyclopaedic multidimensional complexities between words, as Wilks and Meara (2002) recently pointed out, much more research needs to be done on different types of semantic links and how these can be strengthened in the process of helping learners achieve better lexical control, fluency and mastery over their target language. It does appear that previous L1 and L2 word association models may have been overly simple, by treating all types of association in the same way. However, Crow and Quigley's approach (as adapted for use in this study) clearly differentiated between exemplar Keyword categories and their semantic sets of related words (Similar or Synonymous concepts/terms). Incorporating insights from computational linguistics as well as graph theory and semantic field taxonomies may hold keys to better understanding how lexical linkages are formed and strengthened in both L1 and L2 mental lexicons, as well as suggesting more effective means of developing both receptive and productive vocabularies more rapidly

and naturally. A more adequate and expanded model of SLVA and "Balanced Bilingualism" will need to incorporate all association types, while distinguishing between them to include these various dimensions of lexical linkage, various stages and depths of lexical

processing, retention/ storage, and recall/retrieval involved in the ongoing life-long task of language acquisition as it moves through phases of activation, neglect and attrition, relearning and reactivation again.

References:

- Atkinson, R. C. (1975). Mnemotechnics in second-language learning. *American Psychologist*, 30, 821-828.
- Atkinson, R. C., & Raugh, M. R. (1975). An application of the mnemonic keyword method to the acquisition of a Russian vocabulary. *Journal of Experimental Psychology: Human Learning and Memory*, 104, 126-133.
- Bousefield, W. A. (1953). The occurrence of clustering in the recall of randomly arranged associates. *Journal of General Psychology* 49 (2nd half): 229-240.
- Celce-Murcia, M., & Rosenwieg, F. (1979). Teaching vocabulary in the ESL classroom. In M. Celce-Murcia and L. McIntosh (Eds.), *Teaching English as a Second Language*. Rowley, MA: Newbury House. pp. 241-257.
- Chastain, K. (1976). *Developing second language skills*. Chicago: Rand McNally.
- Coady, J. (1997). L2 vocabulary acquisition through extensive reading. In J. Coady & T. Huckin, (Eds.), *Second Language Vocabulary Acquisition*. Chapter 11, pp. 225-37. Cambridge: CUP.
- Cohen, A. D. (1987). The use of verbal imagery mnemonics in second-language vocabulary learning. *Studies in Second Language Acquisition*, 9, 43-61.
- Coll, J. F. (2002). Richness of semantic encoding in a hypermedia-assisted instructional environment for ESP: Effects on incidental vocabulary retention among learners with low ability in the target language. *ReCALL*, Vol. 14, Part 2, Nov. 2002, pp. 263-282.
- Coxhead, A. (1998). An Academic Word List. *Occasional Publication No. 18*, LALS, Victoria University of Wellington, New Zealand.
- _____. (2000). A new Academic Word List. *TESOL Quarterly*, 34, 2, 213-238.
- Crow, J. (1986a) *Vocabulary for Advanced Reading Comprehension: The Keyword Approach*. [SFKA] Englewood Cliffs, NJ: Prentice-Hall Regents.
- _____. (1986b) Receptive vocabulary acquisition for reading comprehension. *Modern Language Journal* 70, 2: 242-250. [22.4]
- Crow, J.T. & Quigley, J.R. (1985) A semantic field approach to passive vocabulary acquisition for reading comprehension. *TESOL Quarterly* 19, 3: 497-513. [3.4]
- de la Fuente, M. J. (2002). Negotiation and oral acquisition of L2 vocabulary: The roles of input and output in the receptive and productive acquisition of words. *Studies in Second Language Acquisition*, Vol. 24, No. 1, March.
- DynEd*. (2002). Demonstration CD. Introduction. DynEd International at www.dyned.com.
- Ekwall, E. E. (1976). *Diagnosis and Remediation of the Disabled Reader*. Boston: Allyn & Bacon.
- Ellis, N. C. (1995). Vocabulary acquisition: Psychological perspectives and pedagogical implications. *The Language Teacher*, Vol. 19, No. 2, (Feb., 1995), pp. 12-16. Tokyo: JALT.
- _____. (1996a). Sequencing in SLA: Phonological memory, chunking, and points of order. *Studies in Second Language Acquisition* 18:91-126.
- _____. (1996b). Vocabulary acquisition: Psychological perspectives. Virtual Library Online at: <http://www.swan.ac.uk/cals/calsres/vlibrary/ne95a.htm>
- _____. (1997). Vocabulary acquisition: Word structure, collocation, word-class, and meaning. In Schmitt, N., & M. McCarthy (Eds.), *Vocabulary: Description, Acquisition, and Pedagogy*. Cambridge: Cambridge University Press.
- Genie* CD-ROMs. (2003). *Oxford Wordpower Dictionary and Phrase Builder* CDs and text. Oxford: Oxford University Press. See elt.enquiry@oup.co.uk for more information.
- Hatch, E., & Brown, C. (1995). *Vocabulary, Semantics and Language Education*. Cambridge: CUP.
- Hill, M. (2003). Online at <http://ec.hku.hk/mmhill/Vocabulary.htm>.
- Hulstijn, J. (1997). Mnemonic methods in foreign language vocabulary learning. In *Second Language Vocabulary Acquisition*. Cambridge: Cambridge University Press. Ch.10, 202-224.
- Jiang, N. Form-meaning mapping in vocabulary acquisition in a second language. *Studies in Second Language Acquisition*, 24, 617-637.
- Joe, A. (1995). Text-based tasks and incidental vocabulary learning. *Second Language Research* 11, 2, 149-158.
- _____. (1998) What effects do text-based tasks promoting generation have on incidental vocabulary acquisition? *Applied Linguistics* 19/3, pp. 357-377.
- Kitajima, R. (2001). The effect of instructional conditions on students vocabulary retention. *Foreign Language Annals*, 34, 5, (Sept.-Oct.), 470-482.
- Kojic-Sabo, I., & Lightbown, P. M. (1998). Student's approaches to vocabulary learning and their relationship to success. *Modern Language Journal*, Vol. 83, No. ii, pp. 176-192.
- Kudo, Y. (1999). L2 vocabulary learning strategies. (nflrc network 14, html document). Honolulu: University of Hawaii, Second Language Teaching & Curriculum

- Center. Retrieved from the World Wide Web:
<http://www.ill.hawaii.edu/nflrc/NetWorks/NW14/>.
- Laufer, B. (1997). The lexical plight in second language reading. In J. Coady & T. Huckin, (Eds.), *Second Language Vocabulary Acquisition*. Chapter 2, pp. 20-34. Cambridge: CUP.
- Laufer, B., & Hadar, L. (1997). Assessing the effectiveness of monolingual, bilingual, and "bilingualized" dictionaries in the comprehension and production of new words. *The Modern Language Journal*, 81, 189-196.
- Lessard-Clouston, M. (1998). Vocabulary learning strategies for specialized vocabulary acquisition: A case study. Paper presented at 3rd Pacific Second Language Research Forum, March 26, 1998, Aoyama Gakuin, Tokyo.
- _____. (2000, March). Student's approaches to technical vocabulary learning in an academic context: Relating strategies and success. Paper presented at the Annual Conference of American Association for Applied Linguistics. Vancouver, B. C., Canada.
- Loucky, J. P. (1994). Teaching and testing English reading skills of Japanese college students. *KASELE Kiyō* 22: 29-34.
- _____. (1996). *Developing and testing vocabulary training methods and materials for Japanese college students studying English as a foreign language*. Ed. D. Dissertation on file with Pensacola Christian College, Pensacola, FL. Also available either from ERIC Center for Applied Linguistics via fax to (202)-429- 9292; or from UMI Dissertation Services, 30 No. Zeeb Rd., PO Box 1346, Ann Arbor, MI 48106-1346. (<http://www.umi.com>).
- _____. (1997a). "Maximizing Vocabulary Acquisition: Recommendations for Improving English Vocabulary Learning for Foreign Language Learners." *KASELE Kiyō* 25: 101-111.
- _____. (1997b). Summary of "Developing and Testing Vocabulary Training Methods and Materials For Japanese College Students Studying English as a Foreign Language." *Annual Review of English Learning and Teaching, No 2*, JACET Kyushu-Okinawa Chapter. (9/30/97: 15-36).
- _____. (1998). Suggestions for Improving ESL/EFL Vocabulary Instruction. *Seinan JoGakuin Kiyō* 45.
- _____. (2002a). Assessing the potential of computerized bilingual dictionaries for enhancing English vocabulary learning. In P. N. D. Lewis (Ed.), *The Changing Face of CALL: A Japanese Perspective* (pp. 123-138). Lisse, Holland: Swets & Zeitlinger.
- _____. (2002b). Comparing translation software and OCR reading pens. On Swanson, M., McMurray, D., & Lane, K. (Eds.), *Pan-Asian Conference 3 at 27th International Conference of JALT, National Conference Proceedings CD*. Kitakyushu, JAPAN. Pages 745-755.
- _____. (2002c). Testing vocabulary levels in Japan. *The Japanese Learner*. No. 28. Oxford: Oxford University. Part I (pp. 15-21).
- _____. (2003a). Assessing computerized bilingual dictionaries used in Japan. *ReCALL*, Vol.14, (2).
- _____. (2003b). Using CALL innovations to enhance students' English reading and vocabulary skills. In P. N. D. Lewis, C. Imai, & K. Kitao (Eds.), *Local Decisions, Global Effects: The Proceedings of JALT CALL 2002*, 121-128.
- _____. (2003c). Testing vocabulary levels in Japan, Part II. *The Japanese Learner*, No. 29, (March), pp. 15-20. Oxford: Oxford University.
- _____. (2003d). Improving access to target vocabulary using computerized bilingual dictionaries. *ReCALL* 14 (2), pp. 293-312. Cambridge: Cambridge University Press.
- _____. (2003e). Using computerized bilingual dictionaries to help maximize English vocabulary learning at Japanese colleges. *CALICO Journal*. September Issue.
- Mackey, W. F. (1965). *Language teaching analysis*. Bloomington, IN.: Indiana University Press.
- Marks, C., M. C. Whittrock, & M. Doctorow. (1974). Reading as a generative process. *Journal of Educational Psychology* 67/4, 484-489.
- Meara, P. (1995). The importance of an early emphasis on L2 vocabulary. *The Language Teacher*, Vol. 19, No.2. Tokyo: JALT.
- Miller, George A. (1951). *Language and Communication*. New York: McGraw-Hill.
- Mizoguchi, S., Sano, M., Shiina, K., Thrasher, R., & Yoshioka, M. (1992). A proposal for the establishment of an EAP list and an analysis of its appropriateness. *JACET Bulletin* 23: 77-96.
- Mohamed, S., & Acklam, R. (2000). *The Intermediate Choice*. London: Longman.
- Morin, R., & Goebel, J., Jr. (2001). Basic vocabulary instruction: Teaching strategies or teaching words? *Foreign Language Annals*, 34, 1, (Jan.-Feb.), 8-17.
- Nation, I. S. P. (1982). Beginning to learn foreign vocabulary: A review of the research. *Guidelines: RELC Journal Supplement* 2, 85-103.
- _____. (1990). *Teaching and Learning Vocabulary*. New York: Newbury House.
- _____. (2000). Learning vocabulary in lexical sets: Dangers and guidelines. *TESOL Journal*.
- _____. (2003). *Online Web Vocabulary Profiler*. Accessible at:
http://www.er.uquam.ca/nobel/r21270/cgi-bin/webfreqs/web_vp.cgi.
- Nation, P., & Newton, J. (1997). Teaching vocabulary. In J. Coady & T. Huckin (Eds.), *Second Language Vocabulary Acquisition*. Cambridge: Cambridge University Press.
- Paribakht, & Wesche, M. (1997). Vocabulary enhancement activities and reading for meaning in second language vocabulary acquisition. In J. Coady & T. Huckin, (Eds.), *Second Language Vocabulary Acquisition*. (pp. 174-200). Cambridge: Cambridge University Press.
- Parry, K. (1993). Too many words: Learning the

- vocabulary of an academic subject. In T. Huckin, M. Haynes, & J. Coady (Eds.), *Second Language Reading and Vocabulary Learning* (pp. 109-129). Norwood, NJ: Ablex.
- Petersen, S. (1997). *The effects of learning nouns in lexical sets*. Unpublished PhD thesis, Temple University, Tokyo.
- Pressley, M., Levin, J. R., & McDaniel, M. A. (1987). Remembering versus inferring what a word means: Mnemonic and contextual approaches. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 107-127). Hillsdale, N. J.: Lawrence Erlbaum.
- Quickionary. (2000). Wizcom Technologies Limited. Assistive Reading Pen that scans, translates and pronounces available from www.wizcompjapan.com.
- Quigley, R. (1986). *A Semantic Field Approach to passive vocabulary acquisition for advanced second language learners*. MA Thesis at North Texas State under John Crow.
- Rikai.com. Online site at: <http://www.rikai.com/cgi-bin/About.pl?Language=Ja> Todd Rudick's versatile translation website gives a variety of possible word for word translations, archives and links.
- Rudzka, B., Channell, J., Putseys, Y., & Ostyn, P. (1981). *The Words You Need*. London: Macmillan.
- Rundell, M., 1998. Recent trends in English pedagogical lexicography. *International Journal of Lexicography* 11(4), 315-342.
- Saito, Y., Garza, T., & Horwitz, E. (1999). Foreign language reading anxiety. *Modern Language Journal*, 83, ii, 202-218.
- Sanaoui, R. (1992). *Vocabulary learning and teaching in French as a second language classrooms*. Unpublished doctoral dissertation, University of Toronto.
- _____. (1995). Adult learner's approaches to learning vocabulary in second languages. *Modern Language Journal*, 79 (1): 15-28.
- Saunders, B. (2002). Giving learners access to vocabulary enrichment. In Lewis, P. N. D. (Ed.), *The changing face of CALL: A Japanese perspective*. Amsterdam: Swets & Zeitlinger.
- Schmitt, N. (1997). Vocabulary learning strategies. In Schmitt, N., & McCarthy, M. (Eds.), *Vocabulary: Description, acquisition and pedagogy*. Cambridge: Cambridge University Press.
- Segler, T., Pain, H., & Sorace, A. (2001). Second Language Vocabulary Acquisition and Learning Strategies in ICALL Environments. *Workshop on Computer Assisted Language Learning, AI-Ed 2001*, San Antonio, TX.
- Shepherd, P., & Mitchell, G. (2003). Online at: http://www.trans4mind.com/speed_reading/speedread.pdf.
- Stahl, S. A., & M. M. Fairbanks. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research* 56/1, 72-110.
- Stahl, S. A., & C. H. Clark. (1987). The effects of participatory expectation in classroom discussion on the learning of science vocabulary. *American Educational Research Journal* 24/1, 541-555.
- Stoller, F., & Grabe, W. (1993). Implications for L2 vocabulary acquisition and instruction from L1 vocabulary research. In T. Huckin, M. Haynes, & J. Coady (Eds.), *Second Language Reading and Vocabulary Learning* (pp. 29-45). Norwood, NJ: Ablex.
- Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass & C. Madden (Eds.), *Input in second language acquisition* (pp. 235-253). Rowley, MA: Newbury House.
- _____. (1995). Three functions of output in second language learning. In G. Cook & B. Seidlhofer (Eds.), *Principle and practice in applied linguistics: Studies in honor of William E. Rutherford* (pp. 125-144). Oxford: Oxford University Press.
- Taniguchi, S. (1995). Goi no gakushuu ni okeru jiko kanyou no juuyousei. (The importance of self-generated processing in vocabulary learning). *The Language Teacher* 19:2, (February), pp. 31-35; Abstract, pp. 41-43. Tokyo: JALT
- Thornbury, S. (2002). *How to Teach Vocabulary*. London: Longman.
- Tinkham, T. (1993). The effect of semantic clustering on the learning of second language vocabulary. *System* 21 (3), 371-380.
- _____. (1997). The effects of semantic and thematic clustering on the learning of second language vocabulary. *Second Language Research* 13, (2), 138-163.
- Waring, R. (1997). The negative effects of learning words in semantic sets: A replication. Online paper at: http://www1.harenet.ne.jp/~waring/papers/Sys2_97.html.
- Wesche, M., & Paribakht, T. S. (2000). Reading-based exercises in second language vocabulary learning: An introspective study. *Modern Language Journal*, 84, ii, 196-213.
- West, M. (1956). *A General Service List of English Words*. London: Longman.
- Wilks, C., & Meara, P. (2002). Untangling word webs: Graph theory and the notion of density in second language word association networks. *Second Language Research*, 18, 4, 303-346.
- Yamamoto, H. (1985). College students' retention of vocabulary learned during the three years of senior high school. *Seinan Women's Junior College Bulletin*, No. 32, pp. 67-92. Kitakyushu, Japan: Seinan JoGakuin