English Vocabulary Recognition and Production:
A Preliminary Survey Report

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Introduction

In 1997 Yoshioka and his collaborators compiled a list of 1500 English words for Japanese university students to acquire in their English language classes. (See below for details.) Before such a list can be effectively incorporated into English teaching in university classes, however, it is important to recognize some basic facts regarding the vocabulary size of the students in their first two years at university. The following report is about a preliminary attempt toward that goal.

Background

Japanese university students are often heard expressing concern about their inadequate knowledge of English vocabulary. A survey of some 1000 students in Kyoto and Osaka, conducted by a JACET research group in 1994-95, showed that the students regarded vocabulary study as the most neglected and the most important for further development of their English proficiency. It was also found that in writing English they were aware of greater difficulty with words and expressions than with grammar or content. The probing tests administered to the same group of students showed further that sample groups of upper-, middle- and lower-score students all

wanted to increase their English vocabulary to improve their writing skill, regardless of their current level of proficiency (Writing Research Group, JACET Kansai Chapter, 1995).

In Japan vocabulary learning has been considered important for L2 acquisition, but most often students have learned L2 words by rote, with their teachers presenting a selection of words to be memorized and occasionally giving quizzes to encourage or evaluate their learning. School entrance examinations provide the major incentive for the students' efforts. Howerer, there have been no well-defined learning strategies or teaching methods: L2 vocabulary has not been taught systematically. At the university level the general assumption is that students can extend their vocabularies "incidentally" simply by being exposed to their reading and listening materials. Thus, vocabulary is treated as pedagogically trivial.

The general lack of interest in systematic vocabulary instruction may perhaps be related to structuralist theories of language (Zimmerman, 1997): grammar or structure is of primary importance in language, but vocabulary is not:

> After the grammatical core has been mastered, the acquisition of new vocabulary hardly requires formal instruction. It can be done by reading or speaking the language. (Hockett, 1958, p. 266)

According to this school of linguistic theory, "function words" such as articles, pronouns, prepositions, auxiliaries, and conjunctions which support the sentence structure need to be introduced in early stages of L2 instruction, whereas only a small number of "content words" are to be introduced until sentence structure is mastered. Thus, the structuralist approach to foreign language teaching, despite its pedagogical emphasis on the oral-aural aspects of language, seems to be as grammar-centered as the traditional grammar-translation method which it strongly criticizes (Fries,

1945, p.39; Lado, 1964, pp. 116ff.; Rivers, 1968, 1972/1983, pp. 57ff.). Chomsky, in comparison, often refers to lexicon, which he considers to be an important part of language:

> A person who has a language has access to detailed information about words of the language. Any theory of language must reflect this fact; thus, any theory of language must include some sort of lexicon, the repository of all (idiosyncratic) properties of particular lexical items. (Chomsky, 1995, p. 30)

Chomsky's central interest, however, lies in syntax rather than "the internal structure of the lexicon" and, therefore, treats lexicon only in so far as it interfaces with syntax (Chomsky, 1965, pp. 84-88; 1975, pp. 17-23; 1981, p. 5, pp. 43-45, pp. 92-101; 1986, pp. 86-101; 1995, pp. 30-33, 130-133, 235-241).

Development of communicative approaches to foreign language teaching in the mid-1970s brought about a change in the view of vocabulary in relation to L2 learning/teaching. More pedagogical weight began to be placed on vocabulary, and research interest was aroused because "without grammar very little can be conveyed; without vocabulary *nothing* can be conveyed" (Wilkins, 1972, p. 111; Carter & McCarthy, 1988, p. 42). All acts of linguistic communication, speaking, listening, reading, and writing, involve understanding of the semantic content of most, if not all, vocabulary items used; speaking and listening comprehension, as compared with writing and reading comprehension, require a faster processing of word meaning.

Related to the communicative or "notional-functional" approach to L2 instruction (Wilkins, 1974) are the theoretical background of functional views on language (Halliday, McIntosh & Strevens, 1964; Halliday, 1966, 1985; Halliday & Hasan, 1976). Vocabulary is increasingly viewed as

"structured or organized internally" (Carter and McCarthy, 1988, p. 18), and not as random which is how structuralist theories might characterize it. Thus, lexical theories and concepts begin to see as much structure in "lexis" as in grammar (Katz & Fodor, 1963; Firth, 1964; Mitchel, 1971; Leech, 1974; Lyons, 1977; Carter, 1987; Carter & McCarthy, 1988).

Computer technology provides an impetus to the compilation, manipulation, and analysis of large volumes of vocabulary data, and makes possible a new variety of vocabulary research (Kuccera & Francis, 1967; Hofland & Johansson, 1982; Johansson & Hofland, 1989; Carroll, Davis & Richman, 1971; Sinclair, 1987, 1991; Sinclair & Renouf, 1988; Renouf & Sinclair, 1991) and computer-assisted vocabulary teaching and testing (Laufer & Nation, 1995).

As research progresses on the lexical component of language, the acquisition of vocabulary also comes to attract greater attention and research, which contributes to making vocabulary teaching a major area of L2 instruction (Allen, 1983; Saville-Troike, 1984; Keen, 1985; Nagy, Herman & Anderson, 1985; McKeown & Curtis, 1987; Carter & McCarthy, 1988; Ahmed, 1989; Nation, 1990; Schmitt & McCarthy, 1997; Nation & Coady, 1988). Left largely unsolved for vocabulary teaching, however, is the fundamental problem of what words are to be taught at which level, though there are numerous "vocabulary lists" already available.[1] Among them, the word list by Yoshioka (1997) is unique in that it takes into consideration the current state of EFL teaching in Japan.

The Yoshioka List

The Yoshioka List, intended for English language courses in Japanese universities, is motivated by the observation that there is a considerable gap between university students' actual lexical knowledge and the vocabulary levels of the teaching materials used in EFL classes. The Yoshioka List is composed of two sub-lists: a 1200-word "Vocabulary for College Study,"

intended for general university English courses in the first two years, and a 300-item "Additional Vocabulary for College Study" for a somewhat more extensive program. They are designed to help students build a vocabulary large enough to understand written or spoken English on contemporary topics such as those that appear in American and British news journals and TV news programs.

At the basis of the Yoshioka List are the following corpora: (1) the vocabulary items found in all the ten English textbooks used in the 30 high schools that send more graduates to Doshisha University than others; (2) 5 sets of listening and reading materials used in English courses in Japanese universities; (3) English texts in the entrance examinations held by 487 private and 396 public universities between 1994 and 1996; (4) the STEP tests from 1987 to 1995 and two versions of the TOEFL; (5) articles from 34 British and American newspapers; (6) articles from 27 British and American news and professional journals; and (7) transcripts of American news broadcasts and public speeches. The total number of items on the seven corpora is over 2 million words.[2]

The procedure of selecting 1500 words out of the seven corpora for the "Vocabulary for College Study" and "Additional Vocabulary for College Study" is as follows: (1) reducing each of the seven corpora by grouping inflectionally related items as a single word type, (2) excluding such items as function words, numerals and proper nouns from each list, (3) comparing corpora in pairs to extract those items that occur in both corpora of each pair, (4) arriving at the list of words common to news journals, newspapers, and TV news programs on the one hand (termed JNT which is interpreted as a word list of contemporary relevance), and those common to university examinations and teaching materials on the other (vocabulary of educational relevance), and finally (5) reaching the lists of 1200 and 300 words on the basis of the list in (4) and by adding high frequency words on the JNT list (Yoshioka, 1997, pp. 5-11).

Thus, the Yoshioka List is compiled on two tiers, *i. e.* contemporary relevance and conditions of English as an L2 in Japanese education system today. The list is also based on the realization that EFL instruction in Japanese colleges and universities should shift more toward contemporary relevance than in the past. Whether the list is primarily for expanding the recognition or production vocabulary or both is not made explicit anywhere by Yoshioka. If so desired and applied, the list could well be of use either for recognition or for production or for both.

The "Vocabulary for College Study" assumes that ten words are introduced in one 90-minute class hour. Since English courses usually meet twice a week for 30 weeks in an academic year, the first two years of class work can cover 10 words x 2 (class hours) x 30 (weeks) x 2 (years), or 1200 words. The 300 words on the "Additional Vocabulary for College Study" mean 10 additional words per week for one year.

The Yoshioka List is based on the assumption that students enter university with the knowledge of approximately 2500 English words studied at junior and senior high schools in accordance with the Ministry of Education's *Shido-yoryo* (courses of study) for secondary education. However, there is no evidence available yet regarding the actual vocabulary size of university students. Therefore, before the Yoshioka List can be used effectively in university English language courses, it would be useful to look into the current knowledge of English vocabulary that students are equipped with.

Survey Procedures

Subjects

As a preliminary step toward investigating the students' vocabulary size, the present study attempted to evaluate university students' lexical knowledge in its two communicative aspects, recognition and production. A series of vocabulary survey tests were conducted with a total of

approximately 360 second-year students (all non-English majors)—366 for recognition tests and 362 for production tests to be precise—each of whom took both a recognition test and a production test. For some measure of the entire group's English language proficiency level, a C-test[3] was conducted independently of the vocabulary tests. As far as the average scores of the C-test indicated, the particular group of subjects under investigation could be assumed to be of approximately the same level as a more general college population of some 1,000 students surveyed in 1995 by the Writing Research Group of the JACET Kansai Chapter and also a second group of some 580 students studied by the same group in 1998-1999, both at the time of the post-test.[4] Figure 1 shows the distributions of the C-test scores of the present Doshisha group (Doshisha) along with those of the pre-test (JACET 1) and the post-test (JACET 2) scores of the JACET survey group of 1995.
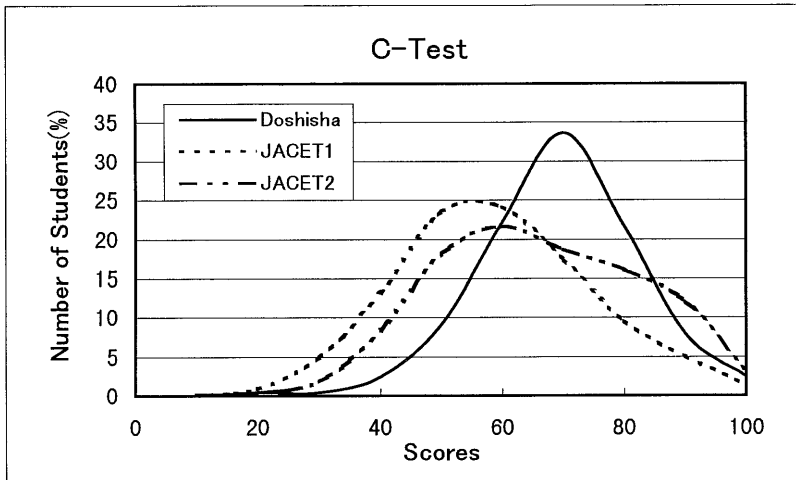

Figure 1: C-test scores of Doshisha and JACET groups.[4]

Vocabulary recognition test

For the vocabulary recognition test, three different lists of 60 test words each were compiled on the basis of Yoshioka's corpora. Each list consisted of three categories of vocabulary items: (1) 10 items out of the 188 words found in all of the 10 major senior high school textbooks (henceforth abbreviated as SH), (2) 10 items from Yoshioka's 1200-item list that were found in none of the ten senior high school textbooks (hereafter CO), and (3) 40 items out of Yoshioka's list that were included in some but not all of the same ten senior high school textbooks (henceforth FO). The 10 SH words and the 10 CO items were picked at more or less regular intervals through the alphabetical lists. The 40 FO items, on the other hand, were carefully selected from several frequency categories, so that all three lists were approximately equal in numbers of items from each frequency bracket. (See Appendix 1 for a sample list of 60 test words.)

The subjects were presented with one of the three lists of 60 words and requested to give a Japanese equivalent for each item, a procedure most likely to be familiar to all subjects. The test time was limited to 5 minutes and controlled as accurately as realistically possible. The reason for limiting the total test time was to ensure more or less immediate or instant response to the vocabulary items, rather than delayed retrieval by pondering, associating, etc. Subsequent to the recognition test, however, some suspicion arose that the CO scores were unduly low because of the time limit of 5 minutes. Therefore, a supplementary recognition test was conducted on 322 of the same second-year group with 10 SH and 10 CO items each, again with a 5-minute limit. For the supplementary test, each class was given a different list of words from the one they had in the first test.

In assessing the student responses, any of the major semantic equivalents in Japanese were accepted as good; marginal equivalents were often given half the score where the three collaborators consented. The total test score

for each student was recorded separately for the three categories of the test words: SH, CO, and FO.

It was assumed that most, if not all, of the SH items, *i. e.* 10 out of the 188 words common to all the 10 major senior high school textbooks, would be recognized by a majority of the students, while very few, if at all, of the CO items, *i. e.* those that appeared in none of the high school texts, would be recognized. In addition, varying numbers of the 40 FO items were expected to be familiar to the students. For the supplementary recognition test with 20 items, a slight improvement was expected on the scores for the 10 CO items, due to the fact that more time was available for retrieving and writing down meaning equivalents in Japanese.

Vocabulary production test

The vocabulary production test was conducted in a brain-storming fashion: the students were presented with six semantic areas such as "family life" and "travel" and requested to write down, within 5 minutes, up to 20 words under any or all of the six given semantic areas. (See Appendix 2 for a list of the semantic areas.) Three different versions were prepared in Japanese, each with six semantic areas of varying degrees of abstraction from the most concrete or personal to the more abstract or less personal. The semantic areas were described with several sample sub-areas: for the semantic area of "family life," for instance, sub-areas listed were "relatives, marriage, generations, birth, death, etc." The three versions were given to 161, 99, and 102 students respectively with the recommendation to work with any of the given areas, moving freely from one semantic area to another, so that the total number of words produced would be maximized. Under normal circumstances, the five-minute test time would allow a person proficient in English to jot down around 80 words if retrieval went smoothly one after another.

In assessing the production vocabulary, no problems were encountered of

students' response-words going out of the specified semantic areas, so that all written entries were counted as good. Minor spelling errors were ignored if easily correctable by word processors; entries with more serious spelling errors were assessed at 50% of the full score if all three collaborators so agreed, and otherwise not counted at all.

It was assumed that the students would respond with a larger number of vocabulary items in more concrete or personal categories such as "foods and drinks" and "family life" than in more abstract or less personal areas such as "government" and "the environment." Also, the numbers of words produced were expected to vary both from one semantic area to another and from student to student.

Survey Results

Recognition test results

As expected, the recognition test results showed a considerable gap in scores among the three categories of test words, *i. e.* SH, CO, and FO, especially between the first two (Table 1). In the first recognition test with 60 vocabulary items, the SH scores on the words common to all ten major senior high school textbooks (SH-1) were very high, the average score being 7.98

Table 1: Average scores of the Recognition test (SH-1, CO-1) and
　　　　　Supplementary recognition test (SH-2, CO-2).

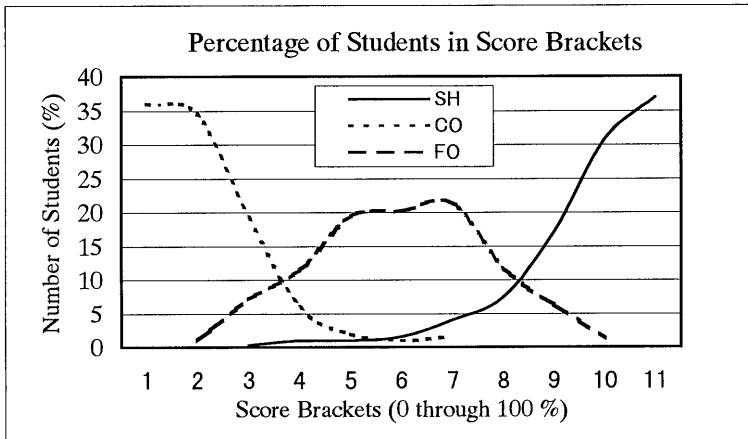| Number of examinees	366		322		366
Word categories	SH-1	CO-1	SH-2	CO-2	FO
Average scores	7.98/10	0.29/10	8.7/10	1.0/10	18.8/40
Standard deviations	1.7	0.64	1.5	1.2	6.8

Figure 2: Percentage of examinees in 11 score brackets for SH-2, CO-2, and FO.

words out of 10 with the standard deviation of 1.7, while CO scores (CO-1) on the words that appeared in none of the high school textbooks were very low, the average being 0.29 out of 10 with the standard deviation of 0.64.

This fact was equally clear, as seen in Table 1 and Figure 2, in the result of the supplementary recognition test with 10 SH and 10 CO words (SH-2 and CO-2 respectively). Probably due to a slightly longer response time available in the second recognition test, *i. e.* 5 minutes for 20 test items instead of the same length of time for 60 items in the first test, both SH and CO scores improved over those of the first test, the average for SH-2 being 8.7 words instead of 7.98 with the standard deviation of 1.5, and that for CO-2, 1.0 instead of 0.29 with the standard deviation of 1.2. Despite the improved scores, however, the stark contrast between the SH and CO scores remained evident: more than 220 out of 322 students recognized 9 or all of the 10 SH words correctly, while a comparable number of students recognized fewer than 2 CO words.

It could reasonably be assumed from these results, therefore, that a large

majority of the second-year university students already acquired and still retain the ability to recognize most of the SH words, while practically the entire list of CO words is yet to be learned one way or another if comprehension of authentic materials regarding contemporary topics is the goal.

   In contrast to the SH and CO test scores with their clear tendencies, the FO scores on 40 of the words that appeared in some but not all high school texts varied a great deal from student to student with the average of 18.8 words out of 40 or 47 % with the standard deviation of 6.8 words (Table 1). In fact, something closer to the standard distribution curve was obtained for the FO scores of the 366 students, showing a wide range of performance from very good to very poor with the peak of the distribution roughly in the central section of 47-48% or 19 items correct (Table 2 and Figure 3).[5]

Table 2: Number of examinees in 9 score brackets of the 40 FO words.

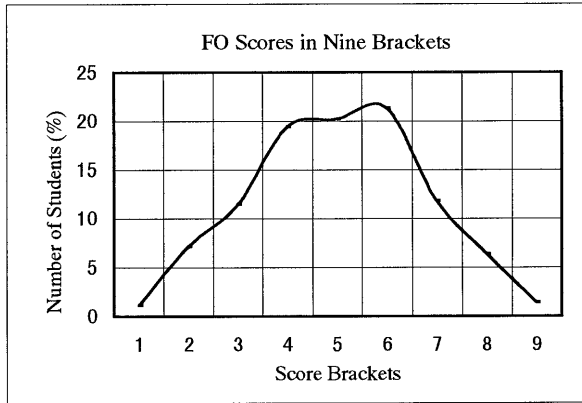| Brackets	Scores	Students	
		Number	%
1	1– 4	4	1.1
2	5– 8	26	7.1
3	9–12	42	11.5
4	13–16	71	19.4
5	17–20	74	20.2
6	21–24	78	21.3
7	25–28	43	11.7
8	29–32	23	6.3
9	33–36	5	1.4
Total		366	100.0

FO Scores in Nine Brackets

Figure 3: Percentage of examinees in 9 score brackets of the 40 FO words.

Production test results

The average total scores on the vocabulary production test varied somewhat among the three versions of six semantic categories, 30.2, 33.7, and 29.7 to be specific, probably because the second version contained semantic areas that were slightly more favorable than the first and especially the third. The comparison of the average scores for separate semantic categories indicated that the second version included one that stood out for its high score, *i.e.* "leisure," while the first and the third versions included a category each that invited the two lowest scores, *i. e.* "thoughts and belief" and "the environment" respectively.

Since each of the three versions consisted of six semantic categories, there were 18 test areas altogether with varying average scores from 1.0 to 10.1. In all three versions, students did best in the most concrete or personal category and did increasingly less well toward the least concrete semantic area, although in between, there were, as it turned out, a few categories that brought forth fairly high scores: "transportation" and "school" in the first version, for instance, and "leisure" in the second

Table 3: Average number of words produced under 18 semantic areas.

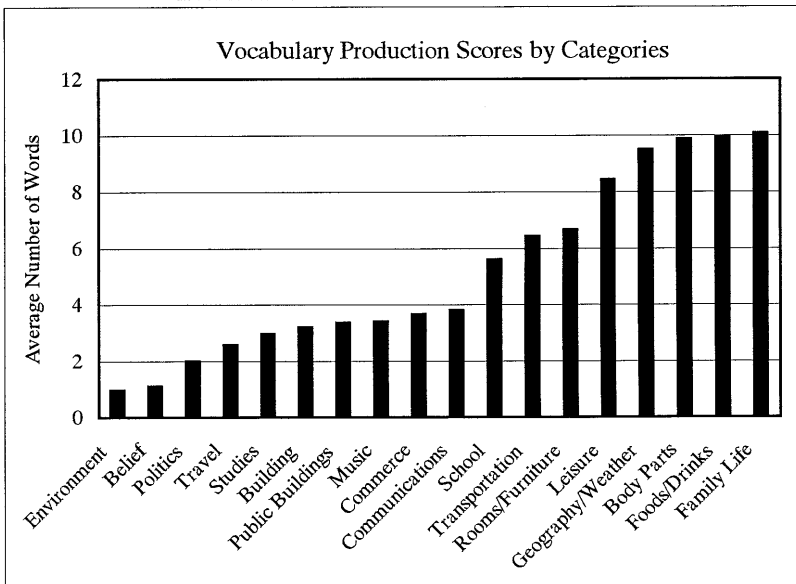|		
3-VI	Environment	1.0
1-IV	Belief	1.1
2-VI	Politics	2.0
3-V	Travel	2.6
2-V	Studies	3.0
3-III	Building	3.2
1-II	Public Buildings	3.4
3-IV	Music	3.4
2-III	Commerce	3.7
1-VI	Communications	3.8
1-V	School	5.6
1-III	Transportation	6.4
2-II	Rooms/Furniture	6.7
2-IV	Leisure	8.4
3-II	Geography/Weather	9.5
1-I	Body Parts	9.9
2-I	Foods/Drinks	10.0
3-I	Family Life	10.1

Figure 4: Average number of words produced under 18 semantic areas.

version as just mentioned above. As shown in Table 3 and Figure 4, when the 18 semantic categories were arranged from the one with the highest score to that with the lowest, four topic areas seemed to form the top group of categories: "family life," "foods and drinks," "body parts" and "geography and weather," followed by the second group of four categories of "leisure," "rooms and furniture," "transportation" and "school," which elicited fewer words than the first group but more than the third group which consisted of 10 other categories. Students seemed to be least able to produce items under such rubrics as "communications," "commerce," "music,"[6] "public buildings," "building," "studies," and "travel," and especially those concerning "politics," "thoughts and beliefs" and "the environment."

Vocabulary recognition and production test results compared

Few, if any, of the words on the recognition test were in the more concrete semantic categories than those listed in the production test. Instead, they tended to be those toward the abstract end of the topic spectrum. In that sense, the production test was not necessarily designed to elicit the same levels[7] of vocabulary items as were listed in the recognition test. Although more abstract categories were, in fact, also included in the production test, they were chosen only by a small minority of students, who responded only with very few words for any of these areas. (This topic is further dealt with in the next section.)

It is also to be noted here that vocabulary test scores in both recognition and production are significantly correlated with the C-test scores: 0.34 and 0.42 with recognition and production test scores respectively (p<0.01). The C-test highly resembles what Laufer (1998) calls a "controlled active" vocabulary test, and in that sense, it is closer to the vocabulary production test than the recognition test. Thus, it is understandable that, of the two correlation figures with the C-test, the one with the vocabulary production

test scores is higher than that with the recognition test scores. Also, while Laufer's controlled active vocabulary test consists of single sentences, the C-test is based on excerpted passages, thus requiring reading comprehension as well as vocabulary recognition abilities. Hence, the C-test scores have a significant correlation with the scores of both the vocabulary recognition test and the vocabulary production test. (See the Discussion section below for further comments.)

Discussion

Recognition vocabulary

Despite the general perception on the part of the students that they have forgotten many of the English words they once learned before entering university, a majority among them seem to be able to correctly recognize, after more than one year in the university, many of the most common vocabulary items found in all ten senior high school textbooks, *i .e.* 188 SH words on one of Yoshioka's corpora. It may well be assumed, therefore, that this part of the English vocabulary is in the students' stable lexical knowledge, at least for recognition.

In addition to the 188 SH words, approximately 50% of the FO words on the Yoshioka List seem to be recognized correctly by a majority of the students. Viewed from another perspective, if any of the FO words are presented to a class, approximately half the students would recognize them reasonably correctly. Since there are 968 FO items on the Yoshioka List, 50% corresponds to slightly less than 500 items, which means that the other 500 or so need to be learned through instruction at the university level. As FO words do not appear in all ten senior high school texts, this test result might reflect the fact that average students recognize fairly well the words encountered in high school textbooks. The top 30% of the students, moreover, seem to recognize a majority of FO words (Table 2 and Figure 3).

Although it is risky to estimate the average student's vocabulary size on the basis of these test results alone, a highly tentative guess points to somewhere between 2000 and 2500 words, the latter figure being based on 1500 senior high school words in addition to the junior high school vocabulary of some 1000 items as recommended in the *Courses of Study* authorized by the Ministry of Education. This falls short of approximately 3,000 words which would allow a reader to "efficiently learn from context with unsimplified text" (Nation & Waring, 1997, p. 11; Liu & Nation, 1985). Also, one of the latest studies "suggests that extensive reading is not a very effective way for learners who have a mean vocabulary size of around 3000 words to expand their lexicons" (Horst, Cobb & Meara, 1998, p. 221). Moreover, an expert view has elsewhere been advanced that a vocabulary size of "3-5,000 word families[8] is needed to provide a basis of comprehension" (Nation & Waring, 1997, p. 10) of materials intended for English-reading public. Another proposed vocabulary size for reading comprehension of authentic materials is 5000 word families (Horst, Cobb & Meara, 1998; Hirsh & Nation, 1992; Laufer, 1988):

> …the 5000 words most frequent word families [*sic*] of English…[have] been proposed as the minimum knowledge base needed for learners of English to be able to infer the meanings of new words they encounter in normal, unsimplified texts. (Horst, Cobb & Meara, 1998, p. 221)

Thus, all proposals point to 3000 or 5000 as a minimum vocabulary size for L2 learners as a basis for further expansion of their lexicons by simply reading for content.

If the estimate of 2000-2500 words is anywhere near the actual vocabulary size of a majority of students, some systematic form of vocabulary instruction is necessary for three reasons. One stems from the

view based on the finding that "vocabulary knowledge...is the most important aspect...for academic achievement" (Saville-Troike, 1984, p. 216); in other words, Saville-Troike's evidence indicates that content comprehension requires vocabulary knowledge first and foremost over the three other factors compared in her study: the amount/ability of oral interaction, native-language influence, or personality traits/attitudes. If vocabulary is the key to comprehension, then it is vocabulary that has to be focused on in reading and listening exercises.

The second reason for the necessity of explicit vocabulary instruction is based on the evidence provided by Horst, Cobb and Meara (1998) mentioned earlier: L2 learners with a mean vocabulary size of less than 3000 might not be able to expand their lexicons merely by reading for content. Since the present estimate of the vocabulary size of the learners under survey does not reach the 3000-word level and falls far short of 5000 suggested by Nation and Waring (1997), simply reading for content is insufficient for lexical expansion. But 2500 is also sufficiently close to 3000 that slight encouragement by carefully planned instruction could be highly beneficial. Related to this is another estimate that, for "incidental" learning of vocabulary to be feasible, the reading material should contain 5 or fewer new words per 100 (Laufer, 1988; Nation & Waring, 1997), which cannot be the case with authentic materials when the reader's vocabulary size is smaller than 3000. An even lower ratio is recommended by West of "no more than one unknown word to fifty known words (2 percent)" (West, 1941, p. 21; Nation & Coady, 1988, p. 99) for efficient vocabulary learning through reading. In brief, instructional planning should start with the selection of reading or listening materials with sound planning for vocabulary increase.

Thirdly, while there still is controversy regarding whether or not vocabulary size increases "incidentally" through reading at school (Nagy & Anderson, 1984; Nagi, Herman & Anderson, 1985; Jenkins, Stein &

Wysocki, 1984; Coady, 1997a, b; Horst, Cobb & Meara, 1998), current research seems to "suggest that it is worthwhile to add explicit vocabulary instruction in the L2 classroom to the more usual or frequent activities of inferring the meaning from context" (Sokmen, 1997, p 239; Haynes, 1993; Coady, 1993; Stoller & Grabe, 1993).

As for the types of vocabulary knowledge, Laufer (1998) presents evidence that, with explicit focus on vocabulary, "in one year of school instruction…passive vocabulary size…progressed very well" (Laufer, 1998, p. 255), although active vocabulary did not do so well. Thus, in the Japanese university classroom, it would be profitable for all students if the FO category of vocabulary items are instructionally highlighted or practiced for recognition. Since the present survey shows that around 50% of the FO words are recognized by approximately half of the students, these students would have an opportunity to have their FO vocabulary knowledge reinforced, while the other half would be able to add to their vocabulary size. Almost all of the CO words, 172 out of Yoshioka's 1200 words, on the other hand, are new to practically every student and require instruction.

If a vocabulary size of 3000-5000 is necessary for reading comprehension of authentic materials (Nation, 1990; Hirsh & Nation, 1992; Nation & Waring, 1997), and if it is true that students already know 2000-2500 words, adding 500-1000 words would bring most students' vocabulary size beyond the threshold of 3000 words. If some 500-968 FO words plus 172 CO words on Yoshioka's list are added to the estimated 2000-2500 that average second-year university students presumably already have, then it would bring their recognition vocabulary size nearly within the range needed for further development of reading and listening proficiency.

Laufer (1998) reports that "university students of engineering who were taking an EFL course acquired 300 word families in one semester in about 50 hours of instruction" (Laufer 1998, p. 265). This is similar in terms of the number of instructional hours to the current set of circumstances of an

average semester in a Japanese university: 180 minutes per week times 15 weeks or 45 hours of class work; four such semesters would reasonably cover the 1200 words as proposed by Yoshioka, if 20 items are dealt with in the two classes each week. The key to success in vocabulary increase seems to lie in setting up some such clear goal with an appropriate list, and in demonstrating to the learner the level of achievement from semester to semester by such means as pre-tests and post-tests.

Production vocabulary

An initial overview of the present set of data indicates that there is an evident disparity between the levels of the vocabulary in the recognition test and the words that appear in the production test results. More precisely, the production vocabulary is of lower levels in the sense of Nation's "levels" (Nation, 1990) than the words listed for recognition tests. This is neither unnatural nor unpredictable. If Melka's proposal is accepted that "the distance between R [*i.e.* recognition] and P [*i.e.* production] should be interpreted as degrees of knowledge or degrees of familiarity" (Melka, 1997, p. 99) with the vocabulary items, then this disparity between the levels of production and recognition vocabulary may well be taken as a measure of difference in degrees or depth of vocabulary knowledge on the part of the students under survey: lower levels of vocabulary are sufficiently familiar for production, while higher levels of words are known only to the extent to which recognition alone, and not production, is possible. More precise analyses are in order on the levels of vocabulary produced in the present survey before anything more precise can be said on the levels or degrees of familiarity.

In view of the fact that the vocabulary items on the recognition tests differ almost entirely from those produced by the students in production tests, it is understandable that the correlation between the test scores of recognition and production vocabularies is no higher than 0.34, though

statistically significant (p<0.01). This correlation figure is, nevertheless, not as low as those between the "passive" and "active" vocabulary of the data collected by Laufer (1998), *i. e.* 0.078 and 0.16 for two different groups of students respectively.[9] Her data indicate that "passive and controlled active size scores correlated with each other well. Free active vocabulary, [10] on the other hand, did not correlate with the other two types," *i. e.* "passive" and "controlled active" vocabulary. (Laufer, 1998, p. 255).

Another aspect related to production vocabulary is its rate of increase relative to the rate of expansion in the recognition vocabulary size. In Laufer's study, despite a remarkable increase in passive vocabulary within one year of instruction,[11] free active vocabulary is reported not to have changed at all in the same period of time (Laufer, 1998). Contrary to Laufer's findings, however, a study by Shaw and Liu (1998) in Britain on 88 university students from overseas shows that "shifts in the vocabulary" take place in 2-3 months of full-time study in an English-as-L2 academic writing course, while grammatical correctness and complexity remain unchanged. Shaw and Liu's data present further evidence that, in the productive aspect of essay writing, vocabulary is well worth focusing on in an L2 classroom.

Both Laufer's and Shaw and Liu's findings are based on words employed in free essay writing with one notable difference: Laufer's subjects are simply instructed to discuss a debatable issue in writing and left free to use or not to use higher-level vocabulary items, while Shaw and Liu's subjects are specifically "pushed" (Swain, 1995, p. 126; Laufer, 1998, p. 267) or encouraged throughout the duration of the L2 course to use "academic" expressions. Here again, the key to expanding the learners' vocabulary size seems to lie in systematic highlighting or consciousness raising regarding lexical aspects of L2 learning and usage: if instructed and encouraged as explicitly as Shaw and Liu's subjects are to use higher levels of vocabulary in writing, the direct result is an increase in the size of free production

vocabulary.

As Nation and Waring (1997) note, compared with the recognition vocabulary needed for reading and listening comprehension, "a smaller number, around 2-3,000 [is needed] for productive use in speaking and writing" (p.10). Skillful use of limited vocabulary could, of course, lead to remarkable expressiveness, even to artistic effect. Thus, if vocabulary expansion is the aim, productive exercises must be organized, not simply for a general purpose such as overall explicitness or expressiveness, but with a principal focus on vocabulary, whether for shifts from lower to higher levels of vocabulary as in Shaw and Liu's case, or for a wider variety, or for some other aim. Thus, in any case, it is necessary to "push" learners "to exploit all their resources" (Laufer, 1998, p. 267) and force them to "'stretch' their Interlanguage[12] to meet communicative goals" (Swain, 1995, p. 126-127; Swain, 1985; Swain & Lapkin, 1995).

It is conceivable that the brain-storming or free association style used in the present survey on production vocabulary does not elicit the full extent of the subjects' vocabulary resources. But if uninterrupted retrieval of one word after another is any measure of lexical ability regardless of the specific "levels" of the retrieved items, the present investigation has obtained a relevant set of preliminary data. Probably more detailed analysis than the foregoing is necessary on the vocabulary items produced by the subjects of this survey before more precise discussion becomes plausible.

Summary and Conclusion

In summary, the present preliminary survey collected a set of data on some 360 second-year university students' recognition and production vocabulary. The average university student seems to be able to recognize practically all of the words found in all major senior high school textbooks and approximately 50% of those that appear in some of them but not in all. A highly tentative estimate of their recognition vocabulary is 2000-2500

word families. Very few of the vocabulary items on the recognition test seem to appear among production vocabulary. Nevertheless, production vocabulary test scores are significantly correlated with recognition test scores. Specifics regarding the levels of both recognition and production vocabularies are necessary before more precise comparisons can be made.

Provided that some explicit and systematic instruction of vocabulary is to be incorporated at the university level, a number of pedagogical aspects must be taken into consideration. First, some effective word list must be prepared as a guideline or checklist, the Yoshioka List (Yoshioka, 1997) being one such attempt. Second, teaching materials must be selected on the basis of explicit concepts regarding lexical aspects such as the ratio between known and unknown words. Third, the students must be encouraged to have, or be provided with, an overall view of vocabulary study, and weekly course work must be organized accordingly. Awareness on the part of the instructor as well as the learner regarding the lexical aspects of L2 acquisition is essential in the entire process of increasing the vocabulary size of university students.

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Notes:

1 Among the well-known frequency lists are those by Thorndike & Lorge (1944) followed by those by West (1953), Carroll, Davies & Richman (1971), Zettersten (1978), leading to more recent large-scale corpora and lexical analyses such as those by Kucera & Francis (1967), Sinclair (1987), Sinclair & Renouf (1988), and Johansson & Hofland (1989). Swadesh (1972) lists 100 basic items from the

viewpoint of comparative linguistics. From the instructional perspective, there are such lists as those by Ogden (1930, 1968), Richards (1943), Richards (1974), Schur (1982, 1983), Xue & Nation (1984), and Nation (1990).

2 2,030,648 to be exact. Texts from journals and newspapers were collected via LEXIS/NEXIS for the period between January 1992 and July 1996, with emphasis on the last two of these years, under such key words as "cyberspace," "Internet," "information highway" and eleven others, the total corpus being 1,054,297 vocabulary items.

3 C-test is a type of cloze procedure in which the last half of every second word in a short passage is deleted for the examinee to supply. See Oller, 1975, 1979; Klein-Braley & Raaz, 1984; Cleary, 1988; Strawn, 1989; Chapelle & Abraham, 1990; Singleton & Little, 1991; Chapelle, 1994; Read, 1997. For the specific C-test format used in this survey, see Writing Research Group, JACET Kansai Chapter, 1999a.

4 A post-test is a diagnostic test given at the end of a course where a similar or identical test (*i.e.* pre-test) is conducted at the beginning of the same course, usually in April as in the two groups tested by the Writing Research Group of JACET Kansai Chapter. The 1995 survey results collected by the Writing Research Group with some 1000 students gave a pre-test average of 54.2 (Std 15.9) and a post-test average of 65.5 (Std 16.7); the post-test average for the 582 students in the second set of the JACET data (Writing Research Group, JACET Kansai Chapter, 1999b) was 64.37 (Std. 15.00). In comparison, the Doshisha group under the present vocabulary survey was 64.7 (Std. 13.1), a notable difference being in the smaller value for the standard deviation.

5 The scores range from 1 through 35 out of 40; the mean (18.78) and the median (19.00) are close to each other; skewness (-0.02) and kurtosis (-0.43) are both low, especially the former.

6 The semantic area of "music" seems to be unique: although the average number of words produced under this category is relatively low, there are some exceptional cases. One student, for instance, produced 11 words under "music," which occupied 32.4% of the total 34 words produced by this student for the entire test. Besides, some of the 11 words were of low frequency categories such as "oboe" and "euphonium," revealing the student's personal involvement with music.

7 The word "levels" here is used in much the same sense as that used by Nation (1990).

8 See Bauer & Nation (1993) for a definition of the word family.

9 This correlation figure between recognition and production test scores may at the same time have to do with factors other than depth of vocabulary knowledge, as

Laufer speculates.

10 Laufer measures "free active vocabulary" by the ratio of the vocabulary items beyond the level of 2000 basic words that are used in a 90-minute essay on the topic "Should a government be allowed to limit the number of children in families?"

11 In Laufer's group of 11th graders, passive vocabulary increased by 1600 words or 84 % and controlled active vocabulary by 850 words or 50 % in one year of instruction, while "no significant progress [was made] in the free active vocabulary" (Laufer, 1998, p. 263).

12 "Interlanguage" is an intermediary form of a second or foreign language produced by a learner (See Selinker, 1972; Selinker & Lamendella, 1976).

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Appendix 1

A sample list for the vocabulary recognition test by categories
10 SH words:
  compare, create, disappear, especially, glory, intelligent, naturally, proud, stare, unfortunately
10 CO words:
  abide, attribute, complimentary, defy, enhance, jury, persist, reaffirm, toxic, vulnerable
40 FO words:
  abandon, awful, bias, calculate, chaos, compromise, damage, describe, drug, engineering, explain, explode, firmly, frequently, globe, halt, highway, imagine, influence, investment, landscape, male, method, moral, neighbor, occasional, perception, plentiful, pure, recall, request, scientific, settlement, site, solution, symbolic, threaten, transfer, widespread, youth

Appendix 2

Semantic areas for the vocabulary production test (translated from Japanese).

List A
1. Body: body parts, health, illness, injury, etc.
2. Types of buildings: city halls, museums, theaters, temples, sports facilities, etc.
3. Transportation: means of transportation, vehicles, passengers, departures, arrivals, pedestrians, etc.
4. Thoughts and beliefs: religion, ideologies, ideals, etc.
5. School: subjects of study, graduation, stationary, school facilities, etc.
6. Communications: media, broadcast, telephone, mail, information, etc.

List B
1. Food: foods and drinks, nutrition, diet, dining facilities, etc.
2. Housing: domicile, rooms, furniture, utility, rent, etc.
3. Commerce: stores, commodities, shopping, payments, etc.

4. Leisure: hobbies, pastimes, sports, games, travel, etc.

5. Fields of study: disciplines such as philosophy, art, literature, sciences, etc.

6. Politics: government, election, parliament, legislation, civil rights, etc.

List C

1. Family life: family, relatives, marriage, generations, birth, death, etc.

2. Geography and weather: seas, mountains, climate, seasons, natural disasters, etc.

3. Building: roof, entrance, gate, hallway, windows, ceilings, etc.

4. Music: instruments, players, types of compositions, dance, etc.

5. Travel: transportation, accommodations, sightseeing, scenery, itineraries, etc.

6. Environment protection: pollution, garbage and waste, energy, etc.

360

2   recognition

production   10

SH   10

CO   10   10

FO   40   60

5

SH

CO   FO

3000   5000

2500

3000

incidental learning