L2 Vocabulary Learning Strategies

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Abstract

The purpose of this research was to describe vocabulary learning strategies and to systematically categorize those strategies. To these ends, in a first study, data were collected from Japanese senior high school students (*N*=325) in a questionnaire in which participants answered the frequency of 56 strategies. Descriptive statistics indicated that many strategies were infrequently used. Factor analysis was performed as a measure to validate the questionnaire. It indicated that four categories (i.e., memory, cognitive, social, and metacognitive) loaded rather clearly and were found to be reasonably reliable, and three items that did not fit into each of them were eliminated.

In the second study, again, Japanese senior high school students participated (*N*=504). Descriptive statistics indicated that the means of each category declined compared to Study 1 probably because the items with high means had been eliminated. Although reliability estimates for each category were reasonably high, factor analysis produced different results for validity because memory and cognitive strategies loaded in one factor, and social and metacognitive strategies loaded in another factor and were named a psycholinguistic factor. Two phenomena turned out to be congruent with past research. One was that cognitively demanding strategies such as keyword method were unpopular whereas cognitively shallower ones such as verbal repetition were popular, which may be attributed to participants' cognitive maturity. The other was that the categories turned out to be consistent with Oxford's (1990) classification based on her research conducted in Alabama and thus strategy use may be culture-free.

Literature Review

Research on learning strategies has been inspired by two closely interwoven disciplines: cognitive psychology and second language acquisition. As Wenden (1987) states, "Research on learner strategies in the domain of second language learning may be viewed as a part of the general area of research on mental processes and structures that constitutes the field of cognitive science" (p. 6). She lists four questions that have guided research on learning strategies to date (p. 6):
1. What do L2 learners *do* to learn a second language?
2. How do they *manage* or *self-direct* these efforts?
3. What do they know about which aspects of their L2 learning process?
4. How can their learning skills be refined and developed?

However, such research has developed in each of the above two fields independently of one another. O'Malley and Chamot (1990) provide a good overview on this issue. First, cognitive psychology has inspired learning strategy research. Research in cognitive psychology was experimental and oriented toward training learners to acquire strategies. In this field, the question was posed as to why there are

some individuals who are very effective in learning. In their expert-novice analyses, cognitive psychologists found that experts have special ways of processing information, which they thought could be learned by others.

O'Malley and Chamot (1990) applied Anderson's (1985) model of mental operation in learning a skill to language learning. According to Anderson (1985), two kinds of knowledge are involved in the acquisition of skills: declarative knowledge and procedural knowledge. The former is *static* factual knowledge, or what learners know about a domain; the latter is the faculty to understand and generate language or apply knowledge of rules to solve a problem without conscious application, known as *dynamic* information. These two kinds of knowledge are thought to be used at different stages or a sequence of skill learning: cognitive, associative, and autonomous stages.

At the cognitive stage, the very beginning stage, learners may try to gain typical declarative knowledge such as phonological and morphosyntactic rules of the language. Thus, learners may gain knowledge about language itself rather than try to use the knowledge actively for purposes such as communicating meaning. The next stage is a transitional stage called the associative stage where learners start to reduce errors in declarative knowledge and to synthesize chunks of elements of the language. In the autonomous stage, learners can perform the language skill without conscious application of the rules: They can automatically use the target language, and many errors of declarative knowledge may disappear.

These stages are not distinct or mutually exclusive because the two types of knowledge are not restricted to a certain stage but used at different stages by learners: learners are always gaining new knowledge about the target language, making mistakes, and reducing these mistakes by learning more about the newly gained knowledge. Furthermore, while this process is taking place, new input is also being received, resulting in the same procedure. Therefore, it may be plausible to interpret the three stages not as distinct but as recurring processes.

O'Malley and Chamot (1990) analyzed learning strategies in parallel with language learning: learning strategies as complex cognitive skills. In this case, the declarative knowledge is the information about learning strategies, and the procedural knowledge is the automatic use and application of language knowledge. In the cognitive stage, learners may know that there are such things as learning strategies or be aware that they are using them in different tasks. The second stage is referred to as the associative stage, a transitional period when the learners start to use learning strategies automatically without conscious application. In the last stage, the autonomous stage, learners may use and apply strategies automatically.

In their attempt to formulate learning strategies in an information-processing theoretical model, three strategies were identified: metacognitive, cognitive, and social/affective. Metacognitive strategies involve contemplating learning processes such as planning, monitoring, analyzing, and assessing learning which are indirectly involved in learning. In contrast, cognitive strategies are directly involved elements of mental processing in learning and thus include direct manipulation and transformation of the learning skills or materials. According to O'Malley and Chamot (1990), they include strategies such as rehearsal, organization, inferencing,

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summarizing, deducing, imagery, transfer, and elaboration. Social strategies are the ways in which learners cooperate or interact with other people in the learning process. This includes asking questions of teachers or peers and asking for clarification. Finally, affective strategy refers to control emotions or negative thoughts to in order to continue to study. Examples include self-talk and self-encouragement.

In the field of SLA, researchers have conducted research on learning strategies independently of cognitive psychologists. Early research in the SLA field was descriptive. Attempts were made by Rubin (1975) and Stern (1975) to describe what a "good language learner" does. They called what a "good language learner" does strategies, and described, classified, and reported activities and dispositions. Building on their research, Rubin (1981) and Naiman, Fr_hlich, Stern and Todesco (1978) proposed classification schemes of language learning strategies. However, their schemes were not systematic since their classifications were based on interviews, classroom observations, and diaries which researchers analyzed and categorized subjectively.

However, since little research has been done regarding learning strategies, it has been difficult to separate "which strategies are fundamental for learning, which ones might be more useful to other learners, and which should be combined with others to maximize learning effectiveness" (O'Malley & Chamot, 1990, p. 7). They continue,

> A precise description of the role of strategic processing in second language learning was missing from these theories [Bialystok (1978), Krashen (1982), Wong Fillmore (1985), McLaughlin, Rossman, and Mcleod (1983), and Spolsky (1985)] of second language proficiency and acquisition (p. 12).

Thus, they argue, it is necessary, to clarify "the role of learning strategies in second language acquisition from both an empirical and a theoretical standpoint" (p.12). Following this identification of research needs, O'Malley and Chamot (1990) suggest,

> the step that would help in understanding the role of strategic processing in second language acquisition would be to use empirical data from language learners who are asked to describe what they do to assist second language comprehension and learning (p. 13).

Although research on learning strategies is becoming increasingly popular, there is no agreement regarding the definition of learning and leaner strategies in the literature. Here, the definition of learning strategies is adopted from Oxford (1990) as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (p. 8). Oxford lists the features of language learning strategies as shown in Table 1. Although she reported that strategies are often consciously employed, she did not include consciousness in her definition because strategies can also be used unconsciously. At any rate, what this definition contains is a collective description of what individual learners do to achieve communicative competence in a language in a self-directed fashion, either consciously or unconsciously.

Table 1
Features of Language Learning Strategies

Language Learning Strategies
1. Contribute to the main goal, communicative competence.
2. Allow learners to become more self-directed.
3. Expand the role of teachers.
4. Are problem-oriented.
5. Are specific actions taken by the learner.
6. Involve many aspects of the learner, not just the cognitive.
7. Support learning both directly and indirectly.
8. Are not always observable.
9. Are often conscious.
10. Can be taught.
11. Are flexible.
12. Are influenced by a variety of factors.

Source: Oxford (1990), p. 9

In order to elicit data on learning strategies from learners, researchers have used a number of techniques. Among them, questionnaire or rating scales have been commonly used. Learners are asked to respond to written questions. There are various of types of questionnaires, from open-ended to very structured. In the really open-ended questionnaire, participants have an unlimited amount of space to concretely write their opinions about strategies or what they do. More structured questionnaires require only one or two phrases short answers. Finally, on the far end of the continuum, there is a questionnaire that requires respondents to answer only by circling numbers on a Likert scale. These responses are then analyzed by researchers using statistical procedures.

Thus, it can be said that questionnaires allow researchers to control the content and focus on only the questions and the responses they want. Thus, they are very efficient in obtaining necessary information. Furthermore, their use enables researchers to receive relevant data from a large number of learners which can then be analyzed by statistical procedures and generalized to the target populations, if the questions are so structured. However, since questionnaires are administered after the learners have already finished with their tasks, such a post hoc self-report may result in learners overestimating or underestimating what strategies they used and how frequently they used them, and most importantly, what they may report may be different from what they actually do.

A number of researchers attempted to develop a classification scheme of language learning strategies (Rubin, 1987; Cohen,1990; Oxford, 1990; Wenden, 1991). Oxford's scheme is the most comprehensive detailed system of six strategies, classified as direct or indirect. The direct strategies include memory, cognitive, and compensation strategies. As the word "direct" conveys, these strategies are directly involved in learning the target language. Oxford defines memory strategies as those "helping students store and retrieve new information," cognitive strategies as "enabl[ing] learners to understand and produce new language by many different means," and compensation strategies as "allow[ing] learners to use the language

despite their often large gaps in knowledge" (p. 37). The indirect strategies include metacognitive, affective, and social strategies. Again, as the word "indirect" conveys, the strategies in this category are indirectly involved in language learning. Oxford defines metacognitive strategies as those "allow[ing] learners to control their own cognition—that is, to coordinate the learning process by using functions such as centering, arranging, planning, and evaluating," affective strategies as "help[ing] to regulate emotions, motivations, and attitudes," and social strategies as "help[ing] students learn through interaction with others" (p. 135).

Based on a series of research projects in Alabama, Oxford (1990) produced the Strategy Inventory for Language Learning (SILL), an instrument to assess learning strategies. There are six sections: Remembering more effectively, using all your mental processes, compensating for missing knowledge, organizing and evaluating your learning, managing your emotions, and learning with others. In total, there are 121 items, which are based on a five-point Likert scale, ranging from 1 to 5. People who respond to the SILL calculate the mean in each section and assess how actively they are involved in their own learning.

The SILL has been used by a number of researchers including Oxford herself. Oxford and Nyikos (1989) administered the SILL to 1200 university students who were learning foreign languages at the University of Alabama, and identified five major categories by factor analysis: formal rule-related strategies, general study strategies, conversational input elicitation strategies, resourceful independent strategies, and functional practice strategies. The reliability coefficient (internal consistency) of the all the items of the SILL was found to be .96.

More recently, Brown, Robson, and Rosenkjar (1996) administered the SILL with a personality test (Y/G Personality Inventory), a motivation measure (Attitude/Motivation Test Battery), an anxiety test (Foreign Language Classroom Anxiety Scale), and two proficiency tests (Michigan Placement Test and a cloze test) to 320 Japanese students at Temple University Japan, who were preparing to study at universities in English-speaking countries. They demonstrated that all six types of strategies clustered together in one factor without any elements of the other measures, and thus demonstrated that the SILL is valid in the sense that the six categories of the SILL measure the same construct, *strategies*. The SILL was also found to be highly reliable. In this study, the reliability coefficients (internal consistency) of the six categories were shown. The reliability coefficients of the memory, cognitive, compensation, metacognitive, affective, and social strategies were .74, .84, .69, .88, .63, and .73, respectively. Although the reliability coefficients of the cognitive and metacognitive strategies were rather high, the rest of the coefficients seems moderately high.

This way, a number of researchers have investigated individual learning strategies or have used the SILL to assess the frequency of learning strategies as a group, which can be used with respect to the four skills (i.e. listening, speaking, reading, and writing). However, *vocabulary* learning strategies is a relatively new area of study. In addition, although individual vocabulary learning strategies have been increasingly researched (Lawson & Hogben, 1996; Avila & Sadoski, 1996; van Hell & Mahn,1997), only two researchers have investigated vocabulary learning strategies as

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a whole.

The first is Stoffer (1995). She developed a questionnaire which contained 53 items designed to measure specifically *vocabulary* learning strategies. She administered this Vocabulary Learning Strategy Inventory (VOLSI) and the SILL to 707 students at the University of Alabama. Both sets of materials were found to be very reliable (the internal consistency reliability coefficients were .90 and .93), although there remains an issue regarding the reliability since the reliability coefficient for each category was not shown. At any rate, Stoffer demonstrated that the 53 items on the VOLSI clustered into nine categories by factor analysis as follows:

1. Strategies involving authentic language use
2. Strategies used for self-motivation
3. Strategies used to organize words
4. Strategies used to create mental linkages
5. Memory strategies
6. Strategies involving creative activities
7. Strategies involving physical action
8. Strategies used to overcome anxiety
9. Auditory strategies

It would have been better if all of these studies that used the SILL and calculated the reliability coefficients of internal consistency had administered the SILL twice within a reasonably short period of time, allowing for computation of the test-retest reliability. Since self-report can fluctuate in a very short period of time, the test-retest reliability would have been a better indication of reliability than the internal consistency reliability coefficient that is based on correlation within the items. However, it is also understandable that two administrations of the SILL to such a large number of people are not realistic due to such constraints as time, logistics, and mortality.

The other researcher who investigated many strategies altogether is Schmitt (1997), who proposed his own taxonomy of vocabulary learning strategies. His scheme is somewhat different from Stoffer's. He distinguished the strategies which learners use to determine the meaning of new words when they first encounter them from the ones they use to consolidate meanings when they encounter the words again. The former includes determination and social strategies, and the latter includes social, memory, cognitive, and metacognitive strategies. The social strategies are included in the two categories because they can be used for both purposes. This categorization is based, in part, on the Oxford's (1990) classification scheme.

Schmitt defined each strategy as follows. Determination strategies are used "when faced with discovering a new word's meaning without recourse to another person's expertise" (p. 205). Social strategies are used to understand a word "by asking someone who knows it" (p. 210). Memory strategies are "approaches which relate new materials to existing knowledge" (p. 205). The definition of cognitive strategies was adopted from Oxford (1990) as "manipulation or transformation of the target language by the learner" (p. 43). Finally, metacognitive strategies are defined as "a conscious overview of the learning process and making decisions about planning, monitoring, or evaluating the best ways to study" (p. 205). Although the definitions

are quite clear, it is unclear whether the strategies classified into the five categories really share the common underlying factors. This is because factor analysis was not run as an indication of the validity of the questionnaire.

Apart from the unclear classification scheme, a number of interesting findings arose in Schmitt's research. He asked a total of 600 Japanese junior and senior high school students, university students, and company employees whether they use the strategies and whether they are useful. The results showed that a bilingual dictionary was most popular. Other popular strategies that follow were verbal repetition, written repetition, and studying the spelling. In contrast, strategies such as the use of physical action, L1 cognates, and semantic maps were least commonly used. Many of the popular strategies were perceived by the participants to be helpful as well. Similar results were observed when the participants were further asked to rate the five most helpful strategies for both the Discovery and Consolidation sections. Strategies perceived as less helpful were imaging a word's meaning, using cognates, imagining word form, skipping or passing a new word, and the Keyword Method.

Another interesting finding was the change of strategy use over time. As the participants became older, they came to use strategies which were less popular with younger learners, and ceased to use the strategies which younger people were found to employ. The same trend was observed in their perceptions of strategy helpfulness. The strategies which became more popular among older people were those which required deeper mental processing such as the Keyword Method, connecting the target word to a personal experience, and word association. In contrast, shallower activities such as written repetition, word lists, and flash cards became less and less common as learners aged, or became cognitively mature. Observing these phenomena, Schmitt made an interesting comment: "It may be that some learning strategies are more beneficial at certain ages than others, and that learners naturally mature into using different strategies. If this is true, then we must take our learners' cognitive maturity and language proficiency into account when recommending strategies" (p. 226).

Moreover, he recommended that the strategies which are likely to be adopted later by learners be introduced to them, taking their cognitive maturity into account. In other words, it may be meaningless to introduce or reinforce strategies which are unlikely to be more commonly used as learners become mature. However, Schmitt is careful about generalization of these results. As he stated, since strategies may be culture-specific, the same findings may not be observed with people from different L1 backgrounds. His research was meaningful in that it proposed a taxonomy of vocabulary learning strategies, indicated the change of strategy use over time, and proposed the idea of introducing new strategies to learners at different stages of cognitive maturity.

In summary, the notion of learning strategies was born in two fields that have developed it independently: cognitive psychology and SLA. The former tried to analyze the strategies that experts employ and then train novices to use them as well. The latter preferred to describe the kinds of strategies that are used. Furthermore, a number of researchers have attempted to systematize strategies of nonnative speakers, using questionnaires such as the SILL that classify various kinds of strategies into categories. It has proved reliable and valid as some studies have shown by collecting

data from people such as junior high school students, senior high school students, university students, and company employees. Though the two studies by Stoffer (1995) and Schmitt (1997) showed taxonomies of vocabulary learning strategies, no study has dealt solely with Japanese senior high school students.

THE PILOT STUDY
Purpose
    The purpose of the investigation of vocabulary learning strategies was to describe strategies that Japanese senior high school students use and systematically categorize those strategies like in the SILL, a systematic classification scheme of learning strategies based on empirical data. To these ends, a pilot study was planned and the following research questions (RQ) were posed:
1.   Currently, what vocabulary learning strategies do Japanese high school students commonly use?
2.   What relationships and groupings were there among the strategy categories?
3.   To what extent was the questionnaire reliable and valid?

METHOD
Participants
    In total, 325 Japanese high school students, about 110 each at three different schools, participated in this project. At each school, one class of 35 students at each grade level participated in the study. They consisted of 148 males and 177 females, and 107 11th, 109 12th, and 109 13th grade-level students. The participants ranged in age from 15 to 18. All classes were chosen by the teachers according to their teaching schedules and the classes furthest along in the curriculum were selected.

    In Japan, there is a hierarchy of senior high school levels based on student entrance examination scores. Top-level schools focus primarily on preparing students for the university entrance examinations. Middle-level schools prepare students both for the entrance examinations and for work. There are two kinds of middle-level schools: traditional high schools and occupational or trade schools. Finally, low-level schools prepare students solely for work. All schools fall somewhere within this hierarchy. The schools chosen for this study were not representative of the full range of this hierarchy. They were all considered high-level schools in their respective prefectures. However, despite the fact that all the participants came from high-level schools, there appears to be a great deal of variation among the students with regard to English proficiency.

    Since the purpose of this research was to develop a test that measures *EFL* learners' vocabulary size, only those who had no prior experience studying in an English-speaking country were included.

Materials
    A questionnaire was used to measure the frequency of the vocabulary learning strategies. These strategies were operationalized as measured by the questionnaire developed by the researcher, based on the study done by Schmitt (1997). In spite of validation by factor analysis in Stoffer's (1995) study, Schmitt's taxonomy was chosen because it dealt specifically with Japanese people of different ages, which is the closest to the samples researched in this project. Although many of the items were chosen from Schmitt's questionnaire because they were frequently used and of the researcher's interest, many other original items were also added to the questionnaire for use in this study.

The questionnaire consisted of two parts: questions to gain demographic information about the participants and questions relating to the strategies that the participants may have used. The strategies were divided into four categories: social, memory, cognitive, and metacognitive. The definitions of these four strategies were adopted from Schmitt (1997). Refer to literature review for a detailed description of each category. A category for affective strategies was not included because it was not clear how they are specifically associated with vocabulary learning strategies. No distinction was made between the strategies used to determine the meaning of a new word and those used to consolidate the meanings because it was thought to be too difficult for the participants to understand and remember such a difference. The definition of each category was also adapted from Schmitt (1997). Each category had 14 items, and thus a total of 56 items was presented to the participants. Although the category assignment at this stage was made according to Schmitt's framework, such assignment was tentative because factor analysis was not run by Schmitt as a measure to validate the questionnaire. Nonetheless, his taxonomy was adopted because a number of researchers argued that learning strategies are culture-specific (O'Malley & Chamot, 1990; McDonough, 1995; Cohen, 1996).

In this questionnaire, the participants were asked to note the frequency of the strategies that they had used to learn vocabulary over the last two weeks (see Appendix A). The scale *never* was important to distinguish because one of the research objectives was to know whether the participants used a certain strategy, and, if they used a particular strategy, how often? How commonly was it used? Since these were some of the research questions, *never* and other choices were distinguished from one another in the questionnaire without underlining the choice *never*. The other five scales' definitions or degrees of frequency were adapted from Taishukan's Genius English-Japanese Dictionary (1988). All the items were presented in Japanese, and necessary and sufficient explanations were given for the items which were expected to be hard to understand.

Procedures

The questionnaire was administered after the participants had signed the consent form (see Appendix B). The following were the steps that the researcher asked the cooperating teachers to follow. Immediately after the test, the teachers asked the participants to fill out the section of the questionnaire pertaining to demographic information. Then, they explained how to respond to the items by giving an example and told the students that they could ask any questions if they found items hard to understand. Students were also told that they should respond to the questionnaire items without discussing the answers with their classmates, because strategies differ from person to person. The students who finished responding to the items were then asked to write down any other strategies that they had used but which were not listed on the questionnaire, as well as any comments or questions that they might have. This was done in order to prevent them from being distracted and talking to their friends who were not yet finished. After they had all finished filling out the questionnaire, they were rewarded with an eraser for their cooperation for this study.

Analysis

Before analyzing the questionnaire data, again, some students were eliminated from data analysis because they had had experience studying English in an English-speaking country. Several statistical techniques were employed. First, in order to answer RQ 1, descriptive statistics for all strategies, the four categories, and the total were reported. Exploratory factor analysis (equamax rotation) was run to answer RQ 2 and the validity part of RQ 3 and as a way to study the validity of the questionnaire. This was necessary because factor analysis was not run in Schmitt's study, which meant that the questionnaire had not been checked for validity from this perspective. To answer the reliability aspect of RQ 3, the reliabilities of each category and the total, were calculated using Cronbach alpha.

RESULTS

Descriptive statistics

To answer RQ 1, descriptive statistics for the questionnaire are shown in Table 2. The averages of the four categories are 26.59 of cognitive strategies, 24.02 of memory strategies, 18.59 of metacognitive strategies, and 8.25 of social strategies in descending order. These means are quite low taking a possible total score of 70 for each category into account. Even the highest mean is 26.59. These low means are attributed to the low mean of each strategy. The reasons why these low means were produced may be because, from students' perception, they did not actively use strategies or they might not have known about these strategies and thus indicated that they did not use them. In fact, some students wrote comments on the last page of the questionnaire indicating that they did not know that there were so many strategies for learning vocabulary, and said that they actually *found* some suitable to them in this study.

Table 2
Descriptive Statistics for the Pilot Questionnaire

Strategies	N	Mean	Min	Max	SD	Variance	Skewness	Kurtosis
Soc1	324	.60	.00	5.00	.90	.81	1.82	4.04
Soc2	324	.16	.00	4.00	.44	.19	3.70	20.58
Soc3	322	1.72	.00	5.00	1.35	1.83	.68	-.17
Soc4	319	.88	.00	5.00	1.32	1.75	1.41	1.05
Soc5	320	.49	.00	4.00	.83	.68	2.02	4.49
Soc6	322	1.19	.00	5.00	1.28	1.64	1.15	.80
Soc7	324	.30	.00	4.00	.71	.51	2.85	9.09
Soc8	322	.50	.00	5.00	.94	.87	2.02	3.80
Soc9	320	.12	.00	5.00	.60	.35	6.08	40.13
Soc10	324	.07	.00	4.00	.36	.13	7.07	61.62
Soc11	321	.37	.00	5.00	.97	.93	3.11	9.69
Soc12	324	.81	.00	5.00	1.02	1.03	1.12	.71
Soc13	323	.79	.00	5.00	.97	.95	1.08	.61
Soc14	324	.32	.00	3.00	.64	.41	2.06	3.84
Social	**325**	**8.25**	**.00**	**50.00**	**6.11**	**37.29**	**1.56**	**6.46**

strategies total								
Mem1	323	2.72	.00	5.00	1.33	1.77	.10	-.69
Mem2	323	1.60	.00	5.00	1.41	1.99	.70	-.34
Mem3	324	.58	.00	5.00	.78	.60	1.64	4.09
Mem4	324	2.02	.00	5.00	1.25	1.56	.55	-.4
Mem5	324	.76	.00	4.00	.93	.87	1.22	1.07
Mem6	324	1.67	.00	5.00	1.21	1.46	.62	.11
Mem7	324	1.02	.00	5.00	1.13	1.27	1.37	2.11
Mem8	324	3.37	.00	5.00	1.44	2.08	-.54	-.68
Mem9	324	.79	.00	5.00	1.20	1.44	1.74	2.48
Mem10	324	1.32	.00	5.00	1.27	1.61	1.09	.84
Mem11	324	2.21	.00	5.00	1.38	1.91	.36	-.58
Mem12	323	1.49	.00	5.00	.95	.90	.71	.88
Mem13	323	2.38	.00	5.00	1.52	2.32	.00	-1.01
Mem14	323	2.19	.00	5.00	1.32	1.74	.42	-.39
Memory strategies total	**325**	**24.02**	**.00**	**49.00**	**9.21**	**84.86**	**.20**	**.01**
Cog1	323	2.80	.00	5.00	1.39	1.94	-.03	-.93
Cog2	323	3.03	.00	5.00	1.62	2.62	-.31	-1.08
Cog3	324	1.92	.00	5.00	1.73	3.00	.42	-1.14
Cog4	323	3.09	.00	5.00	1.58	2.48	-.46	-.85
Cog5	319	1.04	.00	5.00	1.68	2.82	1.39	.46
Cog6	324	2.83	.00	5.00	1.50	2.25	-.04	-1.02
Cog7	321	1.53	.00	5.00	1.44	2.06	.89	.02
Cog8	323	.70	.00	4.00	.94	.88	1.31	1.16
Cog9	324	1.27	.00	5.00	1.52	2.31	1.16	.40
Cog10	324	4.03	.00	5.00	1.13	1.28	-1.18	.79
Cog11	322	1.02	.00	5.00	1.68	2.81	1.36	.30
Cog12	324	1.04	.00	5.00	1.49	2.23	1.24	.32
Cog13	324	.28	.00	4.00	.68	.46	3.03	10.39
Cog14	324	2.13	.00	5.00	1.35	1.81	.60	-.40
Cognitive strategies total	**325**	**26.59**	**.00**	**49.00**	**9.22**	**85.12**	**-.07**	**-.25**
Met1	324	2.49	.00	5.00	1.49	2.22	.15	-.89
Met2	324	1.39	.00	5.00	1.63	2.66	.86	-.52
Met3	324	1.11	.00	5.00	1.17	1.37	1.05	.61
Met4	324	.79	.00	5.00	1.30	1.68	1.87	2.82
Met5	324	.24	.00	5.00	.71	.50	3.68	15.09
Met6	324	.36	.00	5.00	.81	.66	2.97	9.84
Met7	324	1.58	.00	5.00	1.38	1.91	.69	-.27
Met8	324	1.53	.00	5.00	1.25	1.57	.83	.25
Met9	323	1.85	.00	5.00	1.50	2.25	.53	-.70
Met10	324	.37	.00	4.00	.72	.52	2.40	6.74
Met11	324	1.98	.00	5.00	1.25	1.57	.36	-.34
Met12	323	1.98	.00	5.00	1.25	1.56	.71	.11
Met13	324	2.28	.00	5.00	1.46	2.12	.16	-.81

Met14	324	.71	.00	5.00	1.01	1.02	1.52	2.02
Meta-cognitive strategies total	**325**	**18.59**	**.00**	**46.00**	**7.98**	**63.69**	**.58**	**.40**
Grand Total	325	77.45	.00	179.00	26.71	713.16	.28	.74

A closer look at the four categories and the individual strategies among them yielded interesting observations. The average score of the social strategies was far lower than those of other strategies. Furthermore, the average scores of many of the individual social strategies fell under 1.00. Even the highest mean was only 1.72 of Soc3, which means that it was not even *occasionally* used. The least commonly used social strategy was Soc10. Its average was only .07, which means that it was very rarely used. In contrast, all but two means of the cognitive strategy items were above 1.00, which contributed to the highest overall mean among the four categories.

A similar argument holds true for the memory strategies since their overall mean was close to that of all the cognitive strategies. All but three means were above 1.00. Furthermore, Mem 8 received the second highest mean among individual strategies, and five memory strategies received means over 2.00. All of these factors yielded the second highest overall mean, although it was still low. The means of the metacognitive strategies were in the middle of the three other categories. Five means were below 1.00 and even the highest mean was 2.49 of Met 1, meaning that it was *occasionally* used. Half of the metacognitive strategies were *seldom* used. Thus, the overall mean was quite low.

Categories

In order to answer RQ 2 and the validity part of RQ 3, factor analysis with equamax rotation was run. Remember that the assignment of the categories was tentative because factor analysis had not been run to establish the four categories. When the number of factors was not specified, a total of 16 factors were found above the Eigenvalue of 1.00, which accounted for 62.33 % of the total variance. The scree plot is shown in Figure 1. In this case, only small loadings were produced for each factor and thus it was hard to interpret what factors they were. Therefore, factor analysis with the equamax rotation was attempted again, this time specifying the number of factors as four, with the hope of showing that the 56 strategies fit into the four tentative factors as originally hypothesized.

This procedure showed a rather clear picture of the factor loadings as shown in Table 3, although the four factors accounted for relatively low percentages of the total variance (33.46%) and there were numerous other factors that were under Eigenvalue 1.00. In spite of these issues, the four factors were interpreted as follows: Factor 1 was considered memory strategy, Factor 2 as cognitive strategy, Factor 3 as social strategy, and Factor 4 as metacognitive strategy. These interpretations were based on Hatch and Lazaraton's recommendation that "A loading of .30 or above is considered to be a substantial link of a factor and test" (p. 494). Although the individual

strategies did not perfectly fit into the four underlying factors, in general, the factor loadings were good for the four categories. Thus, the answer to RQ 2 was that the originally expected four categories seem to exist. Also, the answer to RQ 3 was that their reliabilities were reasonably high: .73 for the social category, .80 for the memory category, .71 for the cognitive category, and .71 for the metacognitive category.

Figure 1. Scree Plot for the Pilot Study
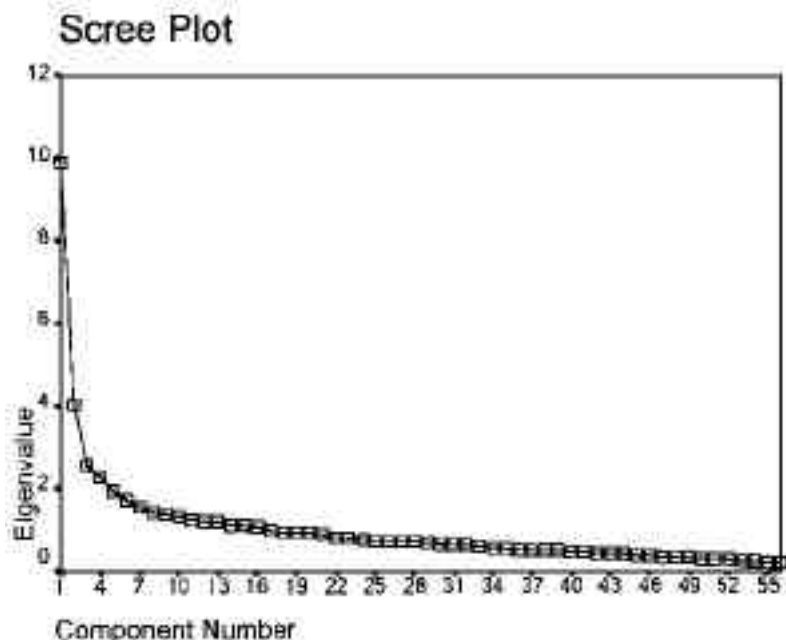
Table 3
Rotated Component Matrix in Factor Analysis

	Component			
	1(Mem)	2(Cog)	3(Soc)	4(Met)
SOC1	.12	.13	.44	.29
SOC2	.02	-.03	.74	.18
SOC3	-.03	.22	.08	.33
SOC4	.03	.09	-.03	.53
SOC5	.06	.09	.44	.43
SOC6	.38	.35	.22	.19
SOC7	.00	.08	.57	-.12
SOC8	.03	.07	.49	-.08
SOC9	-.02	-.07	.22	.23
SOC10	.06	-.04	.57	-.00
SOC11	.12	.10	.20	.39
SOC12	.05	.04	.48	.34
SOC13	.08	.07	.57	.27

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	1	2	3	4
SOC14	-.03	.15	.53	-.05
MEM1	.62	.23	-.08	.11
MEM2	.67	.02	.20	.07
MEM3	.38	-.05	.40	.10
MEM4	.65	.24	.00	.07
MEM5	.53	.03	.38	.13
MEM6	.64	.15	.04	.14
MEM7	.43	.29	.40	.14
MEM8	.12	.66	-.06	-.04
MEM9	.20	-.04	.25	.10
MEM10	.53	.15	.10	.16
MEM11	.25	.48	-.08	.15
MEM12	.27	.28	.05	.11
MEM13	.47	.10	.03	-.13
MEM14	.52	.25	.00	-.09
COG1	.33	.53	-.05	.28
COG2	.09	.54	-.01	.02
COG3	.23	.13	.11	.26
COG4	.07	.67	-.05	.08
COG5	-.04	.15	-.05	.48
COG6	.09	.69	.15	-.42
COG7	.23	.43	.04	.39
COG8	.11	.19	.43	.16
COG9	-.10	.56	.17	.20
COG10	.29	.48	-.03	.04
COG11	.06	.16	.11	.12
COG12	-.05	-.12	.01	.24
COG13	.08	.10	.46	.26
COG14	.32	.43	.06	.09
MET1	.22	.05	.13	.55
MET2	.16	.06	.14	.70
MET3	.14	.03	.13	.69
MET4	.26	.12	.20	.39
MET5	.15	-.12	.21	.39
MET6	.14	.10	.42	.45
MET7	.09	.62	.16	-.02
MET8	.41	.36	.09	.15
MET9	-.06	-.28	-.061	-.00
MET10	.10	.06	.54	.20
MET11	.73	.16	.02	.07
MET12	.14	.60	.31	-.03
MET13	.50	.05	.10	.23
MET14	.36	-.02	.28	.15

Extraction Method: Principal Component Analysis.
Rotation Method: Equamax with Kaiser Normalization.
Rotation converged in 8 iterations.

DISCUSSION

Descriptive statistics

The answers to RQ 1 are provided here. As described in the result section, social strategies were least commonly used. One reason may be that students tend not to collaborate to learn vocabulary. This may be due at least in part to the fact that vocabulary learning does not necessarily require social interaction; students can learn words simply by using dictionaries and listening to their teachers' explanations about new vocabulary. Although communicative activities in and outside of the classroom can facilitate the negotiations about the meanings of new words, the results seem to indicate that this is rarely the case. All the strategies that involve such negotiations received means lower than 1.00, with the exception of the strategy to ask an assistant English teacher (AET) for a sentence including the new word, which received a mean of 1.186. This was still low, yet higher than most social strategies. Few students seemed to ask an AET questions about new words. Another interesting finding was that although 91 students went to test preparation schools, they rarely asked their teachers for translation. They asked for translation at their regular schools more often than they did at the test preparation schools. This may be because the classes at the test preparation schools are usually much larger than those at their regular schools, and thus the students might have been intimidated or felt awkward asking questions. In general, this seems often the case with large classes in Japan.

Memory strategies seem to have been second most actively used. Mem 8 (drawing configuration) received the highest mean of all the memory strategies. Since there is no past data about the use of this strategy, it is an interesting finding. However, do students actually use this strategy? Some students commented on this strategy at the end of the questionnaire. They said that the Japanese translation of this strategy was not clear. Others stated that they could not understand the difference between Mem 8 and Cog 2, and mistook Mem 8 for Cog 2 (to do written repetition). Pearson correlation supported their comments: their correlation was .44, significant at .001. This is one reason that Mem 8 was eliminated for the main study. Another reason will be discussed from the statistical standpoint later.

In contrast, Mem 5 (to use semantic map) and Mem 9 (to use Keyword Method) were among the least commonly used strategies, although they have often been discussed as a useful technique to use to learn vocabulary (Avila & Sadoski, 1996; van Hell & Mahn, 1997; Schmitt, 1997). This is consistent with Schmitt's (1997) research. According to Schmitt, these strategies involve deeper cognitive processing and thus may be too difficult for most senior high school students to employ. In fact, one student demonstrated this point by stating, "such complex learning strategies would rather confuse me and hinder my learning." Schmitt also argued that "these strategies require a greater cognitive effort, but more mature learners seem to realize their value" (p. 224).

The overall mean of the cognitive strategies was the highest, as noted above. Furthermore, Cog 10, to use a bilingual dictionary, was the most frequently used strategy not only among the cognitive strategies, but overall. It received a mean of 4.031, which means that students *usually* use an English-Japanese dictionary on average. This result was rather predictable since the use of the bilingual dictionary is

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a common practice in Japan due to the widespread practice of grammar-translation, especially at these high schools that are oriented toward university entrance examinations. However, even if the teachers employ communicative language teaching (CLT), the use of a bilingual dictionary does not contradict the CLT philosophy. At the early stage of language learning, a bilingual dictionary helps the understanding of foreign words to a great extent. Although there are some schools in Japan that have instructors teach English solely in English where the use of a bilingual dictionary is not allowed, there is no research yet to show whether such instruction helps learners understand materials better or leads to higher proficiency.

The normal use of a bilingual dictionary is likely to be related to the infrequent use of a monolingual dictionary, although the two are not mutually exclusive. Without a certain amount of vocabulary, however, it is hard to understand the definitions of new words in the monolingual dictionary; students would find themselves looking up word after word, as unknown words in one definition lead to other definitions.

Some of the more interesting findings about dictionary use are that an electronic dictionary was only occasionally used, and a thesaurus was even more rarely used on average. The low frequency of the use of an electronic dictionary may be simply due to the fact that it is expensive compared to a paper dictionary. It may also be because multimedia are not widely recognized as useful tools in Japan that can contain a considerable amount of information. In the case of a dictionary, it can include not only word meanings and usage but also synonyms, antonyms, and etymologies, to name a few. A last observation about the use of a dictionary is that the picture dictionary also seems to be rarely used. It is useful both for teachers to teach objects that are hard to describe in words, and also for students to better understand unknown words in their self-study, since many English words are awkwardly translated in an English-Japanese dictionary.

Apart from dictionary use, Cog 4 (to take notes in class at high school) was *often* used as the mean 3.09 indicated. This is the second highest mean in the cognitive strategies. This is probably because it is typical that students at schools oriented toward university entrance examinations listen to the teacher-fronted lectures and take notes about what was said. In such classes, classroom interactions are very rare. Thus, this finding was consistent with the only *occasional* use of social strategies.

Also notable was that rote learning was commonly used. The comparatively higher means for Cog 1 (2.80) and Cog 2 (3.03) illustrated this point. In fact, the means of these strategies were among the highest of all the strategies. This result can be interpreted as a cultural difference, as Cohen (1990) stated. It is often attributed to the fact that rote learning has been widely used in Japan for hundreds of years, as originally recommended by Japanese-language teachers. Therefore, it is somewhat surprising that Cog 1 and Cog 2 only received means of around 3. This means that they are *often* used, but not to the extent of *usually* even on average. This may be because the two strategies are becoming less common. Another interpretation, as Schmitt (1997) noted, is that these two strategies are cognitively *shallower* activities and may consequently serve the senior high school students better than the cognitively *deeper* activities such as the keyword method and semantic mapping. This analysis is consistent with less frequent use of the keyword method and semantic mapping as

argued above.

The metacognitive strategies were ranked in the middle in terms of the category averages. Like the social category, this category had no strategy whose mean exceeded 3.00. This implied that metacognitive strategies were not actively used. In particular, the participants indicated that they did not use media such as the radio, the internet, and newspapers. These are unarguably good authentic materials with which to learn English, particularly for vocabulary in context. The fact that such resources were so underutilized was disappointing. Interesting was the fact that to learn words written on commercial items was second most frequently used among the metacognitive strategies. Since there is a major influx of English words into Japanese and they are used more often than ever before in daily life, they are becoming influential in learning English. Japanese use such words with Japanese phonology. This phenomenon is likely to continue. For this reason, this strategy may have a great potential. One more important point is the fact that many students seem to use English songs to learn vocabulary. They may use songs because of the popularity of Karaoke among young people and their desire to know the meanings of the songs that they are singing. For this purpose, they have to understand the meanings of unknown words in the lyrics. Thus, this strategy may have great potential as well.

All in all, descriptive statistics revealed three general points. First, social activities were very rarely used. Second, the cognitively *shallower* strategies tended to be employed more often than the *deeper* ones. Finally, the participants seemed not to use multimedia to learn vocabulary.

Category analysis

While descriptive statistics lead to some deep insights into the use of strategies, factor analysis also produced interesting yet complicated patterns. When the number of factors was specified at four, there were some strategies that did not fit into the four categories. Thus, to help determine which strategies should be eliminated to enhance reliability and validity, point-biserial correlations were calculated as denoted in Table 4. This produced a correlation coefficient for each item with the total of the category to which the item belongs, and a reliability coefficient if the item was removed from the category.

Table 4
Questionnaire Item Discrimination

	Point Biserial Correlation				
Strategies	Social	Memory	Cognitive	Metacognitive	Total
Soc1	.44				.39
Soc2	.56				.35
Soc3	.30				.29
Soc4	.28				.30
Soc5	.47				.38
Soc6	.29				.52
Soc7	.32				.19
Soc8	.33				.19
Soc9	.21				.14
Soc10	.33				.22

Soc11	.31				.32
Soc12	.46				.35
Soc13	.50				.40
Soc14	.33				.23
Mem1		.57			.48
Mem2		.55			.47
Mem3		.36			.36
Mem4		.58			.50
Mem5		.49			.49
Mem6		.53			.48
Mem7		.46			.55
Mem8		.29			.35
Mem9		.18			.24
Mem10		.48			.46
Mem11		.36			.41
Mem12		.31			.33
Mem13		.36			.26
Mem14		.44			.36
Cog1			.53		.54
Cog2			.40		.34
Cog3			.21		.27
Cog4			.49		.39
Cog5			.24		.24
Cog6			.48		.42
Cog7			.45		.51
Cog8			.22		.38
Cog9			.43		.37
Cog10			.37		.39
Cog11			.16		.19
Cog12			.03		.04
Cog13			.25		.36
Cog14			.34		.42
Met1				.49	.41
Met2				.49	.45
Met3				.53	.42
Met4				.41	.40
Met5				.29	.25
Met6				.45	.45
Met7				.22	.40
Met8				.38	.50
Met9				-.16	-.18
Met10				.36	.38
Met11				.35	.51
Met12				.29	.45
Met13				.37	.40
Met14				.27	.34

The point-biserial correlation statistics were consistent with the factor loadings in

terms of which strategies should be eliminated. In each category, the strategies that produced negative factor loadings with their categories were most carefully examined. Since the metacognitive strategies produced the most negative factor loadings, they were checked first. Met 7 (to test yourself with word tests), 9 (to skip or pass new words), and 12 (to learn words from paper tests – learn from failure) produced -.02, -.00, -.03 loadings respectively, showing the lowest correlation with those of the rest of the category. Therefore, when these items were deleted, higher reliability coefficients were obtained for each item deleted and for the three combined. The reliability coefficient significantly improved, from .71 to.76. Thus, these strategies were logically chosen to be removed from the metacognitive category.

Since the number of strategies removed affected the reliability coefficients of the four categories, the other three categories had to eliminate the same number of strategies. Although various combinations of removing strategies were possible, those which yielded the worst factor loadings in each category were most carefully considered and examined together with the information provided by point biserial correlation. As a result, for social strategies, Soc 3 (to ask the Japanese teacher of your school for Japanese translation), Soc 4 (to ask the preparatory school teacher for Japanese translation), and Soc 9 (to ask your private tutor for Japanese translation) were eliminated. Soc 3 and 4 were removed because they had higher factor loadings with the metacognitive strategies; Soc9 was eliminated because the factor loading was low. Similarly, for memory strategies, Mem 8 (to draw configuration) and Mem 11 (to memorize parts of speech) were removed because they had higher factor loadings with the cognitive strategies; Mem 9 (to use the Keyword Method) was eliminated because it had low factor loading with the memory strategies. Finally for cognitive strategies, Cog 3 (to use word lists made by preparatory school teacher or publisher), 11 (to use a monolingual dictionary), and Cog 12 (to use an electronic dictionary) were eliminated because they had no meaningful factor loadings; in fact, Cog 12 even produced a negative factor loading.

As a result of the elimination procedures, the reliability coefficients improved from .73 to .74 for the social category, from .799 to .802 for the memory category, from .71 to .74 for cognitive category, and from .71 to .76 for the metacognitive category. In addition, the revised four categories explained 37.82% of the total variance; a total of 4% improvement. Each category now contained only eleven strategies yet produced a clearer picture, as shown in Table 5, with enhanced reliability, validity, and time efficiency in terms of administration for the main study. Thus, returning to RQ 2 and 3, the four categories that were originally expected to exist were justified by a series of statistical procedures and validation processes. In addition, some of the Japanese translations for the strategies were adjusted to more accurately reflect the English versions. This was done based on the participants' complaints and suggestions, some of which were discussed in the results section.

Table 5
Rotated Component Matrix

Component

strategies	1(Mem)	2(Cog)	3(Soc)	4(Met)
Soc1	.06	.35	.39	.22
Soc2	.01	.22	.74	-.02
Soc5	.00	.54	.35	.12
Soc6	.36	.27	.18	.36
Soc7	.03	-.07	.61	.03
Soc8	.04	-.08	.57	.03
Soc10	.08	.04	.59	-.09
Soc11	.09	.39	.16	.13
Soc12	.01	.44	.41	.07
Soc13	.05	.38	.50	.11
Soc14	-.02	.01	.54	.14
Mem1	.63	.07	-.06	.24
Mem2	.66	.16	.17	.01
Mem3	.38	.17	.42	-.09
Mem4	.65	.09	-.00	.22
Mem5	.52	.25	.35	-.00
Mem6	.64	.20	.02	.12
Mem7	.42	.30	.33	.27
Mem10	.52	.21	.08	.15
Mem12	.28	.17	-.00	.27
Mem13	.47	-.18	.10	.14
Mem14	.54	-.08	.04	.24
Cog1	.30	.23	-.05	.57
Cog2	.11	-.08	.05	.54
Cog4	.07	.02	-.02	.70
Cog5	-.06	.26	.03	.27
Cog6	.11	-.04	.14	.68
Cog7	.21	.35	.02	.49
Cog8	.11	.20	.42	.17
Cog9	-.11	.12	.17	.62
Cog10	.31	-.02	.01	.50
Cog13	.06	.29	.43	.12
Cog14	.32	.13	.01	.41
Met1	.17	.61	.01	.09
Met2	.11	.74	.03	.10
Met3	.08	.76	.00	.07
Met4	.24	.51	.10	.09
Met5	.12	.42	.17	-.11
Met6	.13	.54	.32	.10
Met8	.40	.11	.11	.38
Met10	.07	.26	.50	.08
Met11	.72	.09	.03	.16
Met13	.48	.30	.03	.05
Met14	.34	.16	.30	-.00

THE MAIN STUDY

Purpose

Based on the validation and adjustment of the questionnaire from the pilot study, the main study was conducted. As in the pilot study, the purposes of this study were to describe what strategies Japanese senior high school students use to learn vocabulary, and to gain insights into what teachers and students can and should do in teaching and learning vocabulary. To these ends, the following research questions were posed:

1. How did the frequency of strategy use change, if at all, when a wider variety of participants are included?
2. Were the categories in the questionnaire reliable and valid for the participants of this study?

Participants

A total of 504 Japanese high school students, about 90 each from six different schools, participated in the main study. At each school, one class of about 35 students per grade level participated in the study. All of them were studying at top-level schools which prepare students for the university entrance examinations. Four of the schools are fairly prestigious (two in Gumma prefecture and two in Ibaraki prefecture). The last two are very famous, prestigious schools in Tokyo and Yokohama. The participants were chosen the same way as in the pilot study, by the teachers whom the author contacted. The classes in each grade level were all those which are furthest along in the curriculum, so that this project minimally affected the course progress. The students ranged in age from 15 to 18.

Even though all the participants were from fairly prestigious schools, this does not necessarily mean that they were similarly proficient in English. First of all, the schools' levels were not the same. Thus, differences in proficiency were expected to exist among the six schools. Second, within each school the students were expected to have a wide variety of proficiency levels. Therefore, the fact that the schools were relatively homogeneous did not mean that their proficiency was also similar. Third, the students had to take five subjects—Japanese, mathematics, social studies, science, and English—in the entrance examinations to enter their high schools. When admitted, their total scores were used rather than one particular subject area score. This means that even if their English score was low they may have still been accepted provided their other scores were high. Thus, it is reasonable to find that they have a wide variety of proficiency levels. For the same reasons, it is also reasonable to expect that they have a wide variety of vocabulary levels.

Again, only those who had no prior experience studying in an English-speaking country were chosen for data analyses.

Materials

Based on the pilot study, the questionnaire was revised so that it would be more reliable and valid, at least for the participants of the pilot study as discussed above. The strategies were also again randomly mixed up (see Appendix C).

Procedures

The procedures were exactly the same as those for the pilot study. Participants were given about 20 minutes to fill it out, which was found to be sufficient in the pilot study.

Analysis

Since the RQs were basically the same as those for the pilot study, the same statistical analyses were conducted, namely, descriptive statistics and exploratory factor analysis. One difference was the rotation method in factor analysis. This time, varimax rotation was employed because it yielded a clearer picture than that of equamax rotation.

RESULTS

Descriptive statistics

The descriptive statistics shown in Table 6 followed the categorization of the pilot study. Overall, the category means were very low. Out of a total of 55 for each category, the means were 6.38 for the social strategies, 14.40 for the memory strategies, 18.17 for the cognitive strategies, and 13.62 for the metacognitive strategies. These yielded a total mean of 52.56 out of a possible 220. The mean for the social strategies was the lowest, and, even the highest mean was 18.17 for the cognitive strategies. On the other hand, almost all the individual strategies received a maximum of 5.0. Thus, each category had much variance, as the standard deviations also indicated: 6.21 for the social category, 7.87 for the memory category, 8.67 for the cognitive category, and 7.21 for the metacognitive category.

Table 6
Descriptive Statistics for the Revised Questionnaire

Strategies	N	Mean	Min	Max	SD	Variance	Skewness	Kurtosis
Soc1	493	.69	.00	5.00	.98	.95	1.63	2.98
Soc2	492	.43	.00	5.00	.87	.76	2.54	7.17
Soc3	492	.71	.00	5.00	1.07	1.13	1.61	2.28
Soc4	492	.32	.00	5.00	.73	.53	3.11	12.44
Soc5	493	.61	.00	5.00	.98	.95	1.70	2.43
Soc6	493	.47	.00	5.00	.91	.83	2.17	4.65
Soc7	491	.55	.00	5.00	1.11	1.24	2.06	3.50
Soc8	493	.49	.00	4.00	.89	.80	1.92	3.11
Soc9	492	.62	.00	5.00	1.29	1.66	2.35	4.65
Soc10	492	.89	.00	5.00	1.34	1.79	1.65	1.94
Soc11	492	.69	.00	5.00	1.08	1.17	1.58	1.94
Social strategies total	**500**	**6.38**	**.00**	**33.00**	**6.21**	**38.59**	**1.04**	**.55**
Mem1	492	1.98	.00	5.00	1.57	2.45	.31	-1.01
Mem2	489	1.25	.00	5.00	1.30	1.69	.95	.21
Mem3	493	.62	.00	5.00	.83	.69	1.60	3.27
Mem4	493	1.53	.00	5.00	1.30	1.68	.58	-.28

Mem5	493	.82	.00	5.00	1.05	1.11	1.34	1.39
Mem6	491	1.65	.00	5.00	1.31	1.72	.58	-.25
Mem7	492	.84	.00	5.00	1.13	1.27	1.77	3.20
Mem8	493	1.01	.00	5.00	1.18	1.39	1.25	1.27
Mem9	493	1.54	.00	5.00	1.29	1.67	.86	.25
Mem10	491	1.74	.00	5.00	1.61	2.59	.46	-1.08
Mem11	493	1.67	.00	5.00	1.32	1.75	.55	-.27
Memory strategies total	**500**	**14.40**	**.00**	**43.00**	**7.87**	**62.00**	**.53**	**.15**
Cog1	491	2.10	.00	5.00	1.60	2.56	.35	-.94
Cog2	493	2.49	.00	5.00	1.57	2.45	.12	-1.10
Cog3	493	2.17	.00	5.00	1.79	3.19	.26	-1.30
Cog4	491	.95	.00	5.00	1.47	2.15	1.45	.93
Cog5	492	1.87	.00	5.00	1.40	1.95	.54	-.43
Cog6	492	1.61	.00	5.00	1.43	2.04	.84	-.07
Cog7	492	.62	.00	5.00	1.05	1.10	2.12	4.70
Cog8	492	1.57	.00	5.00	1.60	2.54	.80	-.46
Cog9	491	3.06	.00	5.00	1.83	3.36	-.47	-1.24
Cog10	493	.35	.00	5.00	.86	.74	3.21	11.46
Cog11	492	1.68	.00	5.00	1.46	2.14	.64	-.48
Cognitive strategies total	**500**	**18.17**	**.00**	**52.00**	**8.67**	**75.12**	**.30**	**-.02**
Met1	493	2.03	.00	5.00	1.58	2.49	.31	-.89
Met2	493	1.93	.00	5.00	1.82	3.31	.41	-1.28
Met3	493	.94	.00	5.00	1.12	1.25	1.38	1.82
Met4	492	1.00	.00	5.00	1.39	1.92	1.38	1.00
Met5	493	.57	.00	5.00	1.10	1.21	2.22	4.56
Met6	493	.42	.00	5.00	.86	.75	2.93	10.52
Met7	493	1.47	.00	5.00	1.33	1.77	.97	.37
Met8	492	.20	.00	4.00	.58	.34	3.95	18.49
Met9	493	1.81	.00	5.00	1.28	1.64	.46	-.42
Met10	493	2.43	.00	5.00	1.46	2.14	.07	-.91
Met11	493	1.02	.00	5.00	1.38	1.90	1.38	1.09
Meta-cognitive strategies total	**500**	**13.62**	**.00**	**41.00**	**7.21**	**52.04**	**.59**	**.44**
Grand Total	500	52.56	.00	126.00	21.99	483.63	.35	.43

Reliability

Reliability estimates were calculated using Cronbach alpha for the four categories validated in the pilot study, and were relatively high: .77 for the social category, .77 for the memory category, .73 for the cognitive category, and .69 for the metacognitive category. While the estimates for the social and cognitive categories improved, those for the memory and metacognitive categories declined. Even so, the reliability

coefficients remained relatively high, indicating that the categories assigned in the pilot study were reasonably reliable.

Validity

As a measure of establishing validity, factor analysis was run again. When the number of factors was not specified, nine factors were over the Eigenvalue of 1.00, and they accounted for 56.53% of the total variance. As was the case with the pilot study, these factors were hard to identify. Thus, factor analysis was run again by specifying the number of factors at four, following the categories supported in the pilot study. The result is indicated in Table 7. These four categories accounted for 43.19% of the total variance. Components 1, 2, 3, and 4 had Eigenvalues of 8.62, 6.75, 1.88, and 1.76, respectively. The scree plot is shown in Figure 2.

Table 7
Rotated Component Matrix for the Revised Questionnaire

| | Component | | | |
	1	2	3	4
Soc1	.55	.01	.27	-.03
Soc2	.66	-.26	.12	-.08
Soc3	.69	-.17	.09	.05
Soc4	.37	-.10	.34	.27
Soc5	.29	.10	.22	.23
Soc6	-.02	.16	.50	.02
Soc7	.75	-.40	.01	-.04
Soc8	.26	.15	.37	.14
Soc9	-.02	.11	.71	-.09
Soc10	.51	-.25	.32	.02
Soc11	.63	-.25	.17	.05
Mem1	-.31	.70	.10	.22
Mem2	-.12	.50	.18	.42
Mem3	-.02	.49	.04	.34
Mem4	-.18	.74	.09	.12
Mem5	.72	-.00	-.01	-.01
Mem6	.25	.60	-.10	.13
Mem7	.07	.43	.42	.25
Mem8	-.13	.56	.16	.10
Mem9	.65	-.02	-.02	.01
Mem10	-.31	.50	.10	.19
Mem11	-.06	.65	.18	.02
Cog1	-.25	.70	.26	-.04
Cog2	.06	.50	.26	-.31
Cog3	-.36	.54	.31	-.06
Cog4	.44	.04	.21	-.12
Cog5	.30	.49	.24	-.26
Cog6	.55	.17	.06	-.07
Cog7	-.11	.23	.41	.14
Cog8	.21	.47	.17	-.10

Cog9	-.46	.58	.22	.02
Cog10	.22	.13	.40	.12
Cog11	-.28	.59	.05	.17
Met1	-.21	.39	.15	.46
Met2	-.15	.29	.22	.44
Met3	.26	.14	.06	.60
Met4	.68	.01	-.10	.23
Met5	.56	-.11	-.00	.36
Met6	.21	.03	.22	.51
Met7	.37	.56	-.07	.02
Met8	.05	.06	.57	.17
Met9	.30	.55	-.08	.28
Met10	.54	.10	-.05	.15
Met11	.79	-.10	.11	-.00

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
Rotation converged in 6 iterations.

Figure 2 Scree Plot for the Main Study
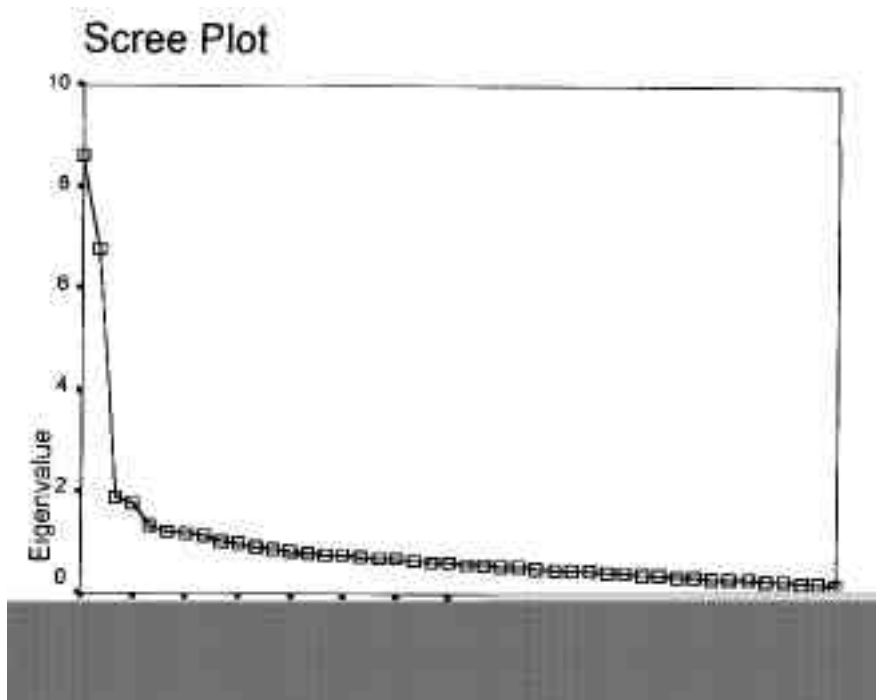
DISCUSSION

Descriptive statistics

With a total possible score of 55 for each category, all the category means were low, even lower than those in the pilot study. The mean of the social category

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dropped from 8.25 to 6.38, the memory category from 24.02 to 14.40, the cognitive category from 26.59 to 18.17, and the metacognitive category from 18.59 to 13.62. The largest drop was observed in the memory category; the difference was almost 10 points. The highest score for the memory strategy also dropped from 49 to 46. The most likely explanation for these declines was the smaller number of items in each category in the main study. For the memory category, in particular, two strategies that had received among the highest means within the category were eliminated. It naturally follows that the overall mean for the memory category went down. In addition, in the main study, the reason why the overall means of the four categories were low was because the means for the individual strategies were low. Even the highest mean was 3.06 for Cog 9 (to use a bilingual dictionary), which also had the largest variance among all the strategies. This was a result consistent in both the pilot and the main study.

Although the social category did not contain the lowest mean, overall the category as a whole was an extreme case in that all the averages were below 1.00. This means that on average, social strategies were not even *seldom* used. The lowest mean was found in the metacognitive category. It was Met 8 (to put English labels on physical objects) which also had the lowest standard deviation, .581. While most other strategies had a maximum of 5.0, that of Met 8 was 4.0. All these data about Met 8 convey that the participants used it in a rather consistently rare fashion. All of these sources of information support the answer yes to RQ 1. The frequency of strategy use radically changed.

Category analysis

As can be seen from Table 8, the four categories validated by the pilot study were not applicable in this study because the individual strategies loaded so differently from the pilot study that it became difficult to establish four categories, and thus the four categories do not appear to be valid for the samples in the main study. Following this result, factor analysis was run again to identify what categories existed. Since specifying the number of factors at four did not indicate a clear picture of the categories, the number of factors was reduced to three. When the number of factors was reduced to three, the overall picture of the categories became rather clear, as indicated in Table 16.

Table 8

Rotated Component Matrix for Three Factors

	Component		
	1	2	3
Soc1	-.048	.533	.284
Soc2	-.336	.620	.137
Soc3	-.206	.677	.095
Soc4	-.041	.411	.322
Soc5	.139	.330	.204
Soc6	.167	-.013	.502
Soc7	-.463	.718	.024
Soc8	.164	.283	.361

Soc9	.090	-.019	.716
Soc10	-.276	.497	.324
Soc11	-.279	.619	.170
Mem1	.755	-.235	.088
Mem2	.616	-.018	.147
Mem3	.570	.065	.019
Mem4	.753	-.132	.091
Mem5	-.073	.701	.007
Mem6	.583	.285	-.094
Mem7	.480	.125	.408
Mem8	.576	-.091	.154
Mem9	-.050	.647	-.010
Mem10	.557	-.250	.086
Mem11	.630	-.037	.188
Cog1	.674	-.231	.269
Cog2	.370	.009	.298
Cog3	.527	-.351	.314
Cog4	-.037	.404	.230
Cog5	.355	.255	.281
Cog6	.092	.524	.077
Cog7	.255	.140	.401
Cog8	.393	.202	.189
Cog9	.603	-.424	.219
Cog10	.150	.237	.395
Cog11	.640	-.222	.035
Met1	.534	-.103	.107
Met2	.427	-.050	.183
Met3	.295	.377	.011
Met4	.018	.718	-.104
Met5	-.043	.622	-.023
Met6	.169	.311	.179
Met7	.497	.383	-.053
Met8	.115	.083	.552
Met9	.576	.371	-.090
Met10	.093	.560	-.045
Met11	-.163	.764	.129

Since most memory and cognitive strategies loaded together, Component 1 was considered the psycholinguistic factor, with strategies directly involved in vocabulary learning. Component 2 was named the metacognitive factor, characterized by strategies indirectly involved in learning because most social and metacognitive strategies clustered in one category. The social strategies can be regarded as metacognitive strategies since they are the types of social interaction that inevitably involves negotiations for meaning by planning, monitoring, or evaluating the best ways for the students to study. Soc 1 (to study and practice meaning of words in a group outside of class) is a good example. This strategy involves conscious planning and monitoring to study with friends, yet does not directly entail learning. Learning

occurs in the brain through such social interactions. Similar arguments hold true for other social strategies, as well, justifying Component 2 as the metacognitive factor.

These results turned out to be congruent with Oxford's (1990) classification schemes yet in a slightly different fashion. As discussed in the literature review, Oxford classified all the strategies into two large categories, one that is directly involved in learning, and the other that is indirectly involved in learning. At this point, the results obtained in the main study were completely congruent with Oxford's classification. However, they were different in the sense that those two categories could not be further divided into subcategories.

While most strategies fit into one of the two factors, there were six strategies which fit into neither Component 1 nor 2 but rather into 3. They are listed in Table 9. In order to determine why they did not fit into either one of the two categories, point-biserial correlations were computed. The correlation coefficients were .11 for Soc 6, .30 for Soc 8, .19 for Soc 9, .28 for Cog 7, .22 for Cog 10, and .19 for Met 8. These strategies had low item-total correlations. In an attempt to identify what Component 3 was, these six strategies were examined to find what they had in common. However, obviously, there was nothing in common; Component 3 merely contained the six strategies that were different from the other two categories. All of these issues led to the conclusion that Component 3 was an artifact produced statistically; it was not a distinct category in reality.

Table 9
Outliers

Soc6	Ask your brothers and sisters for Japanese translation
Soc8	Ask an English conversation school teacher for paraphrase or synonym
Soc9	Learn by pair work in class
Cog7	Use picture dictionary
Cog10	Use a thesaurus
Met8	Put English labels on physical objects

A combination of all this information about the strategies answers RQ 2. The four categories validated in the pilot study were considered reliable to a certain extent because the reliability coefficients for the four categories were reasonably high. However, they were not valid in the main study because factor analysis, the point-biserial correlations, and other information indicated that there were only two major factors. These were identified as a psycholinguistics-oriented factor that is directly involved in learning, and a metacognitive factor that is indirectly involved in learning. Although factor analysis is not the only way to validate the questionnaire, it was statistically a major element together with the point-biserial correlations in this study in determining the classification.

CONCLUSION

Many findings of the questionnaire turned out to be quite congruent with those of Schmitt's (1997) descriptive studies and of Oxford's (1990) classification schemes. The strategies most frequently used were rote learning, and the strategies less commonly used were those that involved deeper cognitive processing, such as the key word technique and semantic mapping. As Schmitt argued, the latter strategies were cognitively so demanding that most senior high school students could not use them yet; they had not achieved sufficient cognitive maturity to use them. While this may hold true, it is also true that historically rote learning has been encouraged in learning a language, whether an L1 or L2, and thus is commonly used.

As far as classification is concerned, the main study seems to support Oxford's (1990) classification schemes as a whole. Four types of strategies were found and validated in the pilot study. In the main study they were eventually classified into two larger categories, direct and indirect strategies, both of which further consisted of two kinds of strategies identified in the pilot study. The former included cognitive and memory strategies, and the latter contained social and metacognitive strategies. In addition, although some researchers argue that strategies may be culture-specific (O'Malley & Chamot, 1990; McDonough, 1995; Cohen, 1996), this research empirically provided evidence that this argument may not hold true. While Oxford (1990) based her scheme on her research in Alabama, this study was conducted in Japan, very different cultures. Therefore, the results of this study suggest that learning strategies may be commonly employed by learners at least in Japan and in Alabama, rather than culture-specific. Future research might investigate this issue in more depth.

Implications

What pedagogical implications can be derived from this research? This study suggests that students should be exposed to many strategies. As stated above, some students wrote that they did not know that there are so many different strategies to learn vocabulary. Furthermore, they said that they planned to try some that they *found* in the questionnaire and that looked interesting, but that they had never thought of before. If students can find strategies suitable to them and actually use them, this might increase their vocabulary size.

While it was found that Japanese senior high school students used many different strategies to learn vocabulary, it was also found that there were some that they did not use such as the Keyword Method and semantic mapping. It is possible that these "unknown" strategies might help them learn vocabulary. Also, as Schmitt (1997) argued, such cognitively demanding strategies lead to higher retention in memory than do the cognitively shallow activities such as verbal repetition. Therefore, English teachers might want to introduce such potentially effective techniques to their students and encourage them to try these strategies out.

The goal of doing these things is to enhance learner autonomy; ultimately students need to learn independently of teachers (Wenden, 1991; S_kmen, 1997; Cohen, 1998). The first step is to have students identify what strategies they actually use. If students

are not aware of what they are doing, students and their teachers cannot improve learning. The questionnaire used in this study might prove useful for diagnostic purposes to identify what strategies students use and do not use. To do this, the students seriously need to reflect on their learning. Once they identify what they do and do not do, teachers can help them choose and explore strategies that seem suitable to them to be able to learn the target language more effectively, and to self-evaluate and self-direct their learning. Often, this is a cyclical process: if the strategies that they chose work for them, they are set; if not, they can try something else. At this stage, teachers play an important role; they might conference with their students, introduce new strategies to them, and step back and see how it is working. This requires continued effort and cooperation between teachers and students.

Finally, the goal of strategy training is for students to be self-directed learners. To accomplish this goal, teacher educators and teachers must be knowledgeable about as many strategies as possible and introduce them to their students whenever students need help. If teachers are not very knowledgeable about strategies, they need to make the effort to investigate strategies by themselves or consult with specialists.

Limitations

Naturally, there are some limitations in a large-scale study like this. First and foremost, since the questionnaire is self-report and the single source of information in this part of the study, it is not clear whether the participants actually used the strategies they indicated in learning vocabulary. Their responses may be just their beliefs or thoughts that they have about their use of strategies. There must have been differences in the awareness of strategy use among individuals, and some may have inadvertently responded incorrectly. In order to investigate students' actual use of strategies, researchers must observe classes where vocabulary learning is taking place, use think-aloud procedures (introspection), and interview the students to find out what they do to learn vocabulary, and so forth. Although such multiple sources were not feasible for this study, they would have provided more insights into what learners actually do.

There may also have been some unclear points in the questionnaire itself. Although the operationalization of frequency followed the dictionary's definitions for the six Likert-type-scale continuum, *never* to *always* may have been fuzzy because the interpretations of these scales can change according to context (Hatch & Brown, 1995). For example, the participants may have thought of different contexts when they were asked how frequently they use a bilingual dictionary. They might have thought of home context or school context. Their answers may have been "It depends." Therefore, it would have been better if the context had been specified. Also, as one teacher pointed out, the definitions of some words may not have been clear. For instance, the word AET was probably vague because while some schools have full-time AETs, others only have part-time native speakers. Therefore, the students may have had different interpretations of the word AET.

There is an issue in the statistical procedures, too, as discussed above in the reliability section. The reliability estimates of internal consistency may not be appropriate to measure something that could fluctuate in a short period of time. The

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test-retest reliability measure is a better indicator of reliability in this type of research, if two administrations with the same participants are possible at all.

Despite these limitations, this study found results congruent with past research in terms of both use of strategies and classification schemes. Nonetheless, further research would be useful to gain more insights into learning strategies. To this end, questions for further research were posed:

1. Would different insights have been obtained if multiple sources of information had been used?
2. To what extent would the questionnaire have been reliable and valid if the same students participated in this project twice?
3. What results would have been obtained if contexts of learning had been specified?
4. Would the strategies reported be those that are actually used by the participants?
5. Do the cooperating teachers give explicit instructions to urge the participants to use learning strategies suitable to them?

Would the deeper-processing strategies lead to better learning (i.e., faster retrieval of words and appropriate use according to contexts) if such strategies were fostered in one class, and shallower activities such as rote learning in other classes?

APPENDIX A
LEARNING STRATEGIES QUESTIONNAIRE
Questionnaire of Vocabulary Learning Strategies

Please answer the questions first, before you continue on to the following
questionnaire.
1. Sex: male/female (circle one)
2. Grade level: 1st grader/2nd grader/3rd grader (circle one)
3. Age: _____ years old
4. If you have studied English or lived in an English speaking country, please
    indicate how long it was. _____ years and _____ months
5. You go to preparatory school. Yes/No (circle one)
6. If and only if you have studied a foreign language other than English, please
    indicate which language and for how long.
    language _____ length of study _____ years and _____ months
7. What language do you study in addition to English at school?

The following list is a list of vocabulary learning strategies. Learning strategies
here refer to the methods by which you learn vocabulary. I would like to know what
you actually do, NOT what you should do or want to do. I would like you to indicate
how often you have used a certain strategy over the last two weeks, irrespective of the
skills (i.e. listening, reading, speaking, and writing) and of the place of learning (i.e.
school, preparatory school, and home). If you do not use a strategy at all, please circle
the word *never*. If you use a strategy, please circle one of the words, *seldom*,
occasionally, *often*, *usually* or *always*, according to the frequency. These words
mean: *never* (0%); *seldom* (rarely, 20%); *occasionally* (40%); *often* (60%); *usually*
(80%) and *always* (100%). If you use a bilingual dictionary 80% of the time when
learning vocabulary, for example, please circle the word, *usually* the following way:
never seldom occasionally often usually always
 0%   20%   40%   60%   80%   100%
If you want to correct the circling, please delete it and circle your best choice clearly.
Also, please do not circle in between the items. Circle only one of the words. In this
questionnaire, these are no correct or wrong answers. Also, there is no restriction or
rule that you cannot use one particular strategy simultaneously with another one.
They are not mutually exclusive. For example, if you use both a bilingual dictionary
and a monolingual dictionary 60% of the time when you try to learn vocabulary,
please circle the word, *often* in the items 43 and 14 below. This way, please indicate
the frequency of the strategies you use.
1. Paraphrase the word's meaning by yourself
 never seldom occasionally often usually always
  0%   20%   40%   60%   80%   100%

2. Learn words from paper tests (learn from failure)
 never seldom occasionally often usually always
  0%   20%   40%   60%   80%   100%

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3. Guess from textual context in reading
never seldom occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

4. Use an English-language TV program
never seldom occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

5. Ask preparatory school teacher for Japanese translation
never seldom occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

6. Ask an AET for a paraphrase or synonym
never seldom occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

7. Skip or pass new words
never seldom occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

8. Test yourself with word tests
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

9. Put English labels on physical objects
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

10. Use Keyword Method
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

11. Use English-language songs
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

12. Ask Japanese teacher to check your flash cards or word lists for accuracy
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

13. Learn by group work in class
never seldom   occasionally often   usually   always

0%   20%   40%   60%   80%   100%

14. Use a monolingual dictionary
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

15. Use English-language internet
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

16. Connect the word to its synonyms and antonyms
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

17. Use spaced word practice
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

18. Test with your parents
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

19. Use an electronic dictionary with multimedia annotations
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

20. Do written repetition
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

21. Learn by pair work in class
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

22. Use new word in sentences
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

23. Study and practice meaning in a group outside of class
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

24. Connect word to already known words

never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

25. Ask your private tutor for Japanese translation
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

26. Learn the words of an idiom together
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%
27. Ask Japanese teacher of your school for Japanese translation
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

28. Take notes in class at high school
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

29. Use a thesaurus
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

30. Memorize the meaning of affix and roots
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

31. Memorize parts of speech
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

32. Use picture dictionary
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

33. Ask your brothers or sisters for Japanese translation
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

34. Take notes in class at preparatory school
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

35. Group words together within a sroryline
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

36. Keep a vocabulary notebook
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

37. Image word's meaning
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

38. Connect word to a personal experience
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

39. Listen to an English-language radio program
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

40. Use 'scales' for gradable adjectives
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

41. Ask your uncle or aunt for Japanese translation
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

42. Use loanwords in study
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

43. Use a bilingual dictionary
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

44. Do verbal repetition
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

45. Learn words written on commercial items
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

46. Listen to tape of word lists
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

47. Ask your parents for Japanese translation

never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

48. Ask an AET for a sentence including the new word
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%
49. Use word lists made by preparatory school teacher or publisher
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

50. Associate the word with its coordinates
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

51. Use an English language video
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

52. Ask an English conversation school teacher for paraphrase or synonym
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

53. Draw configuration
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

54. Use semantic maps
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

55. Read an English-language newspaper
 never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%

56. Use the vocabulary section in your textbook
never seldom   occasionally often   usually   always
  0%   20%   40%   60%   80%   100%
    Please write any other strategies you have used that are not written above, if any. If there is no strategy you can think of, please give me any comments, or ask me any questions about this questionnaire or my research. Any comments or questions are welcome. I will answer to you via your teacher.

Thank you very much for your cooperation. I will use your answers as effectively as I can.

APPENDIX B
CONSENT TO PARTICIPATE
Yoshimitsu Kudo
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This research is to investigate vocabulary learning strategies which Japanese high school students currently use, and the size of their vocabulary.

If you agree to participate in this project, you will be asked to do two things. First, you will take a vocabulary test which measures vocabulary size, and second, you will fill out a questionnaire in which you indicate what kind of strategies you use and how often you use them to learn vocabulary. It will take about 45 minutes to finish both of them. After you finish, you will receive an eraser.

If you agree to participate in this project, your data will be used by the researcher for the purpose of his Master's thesis which is to be submitted in partial fulfillment of the requirement of the Master of Arts in English as a Second Language. Your data will never be used for any other purposes. Your name will never be identified nor your privacy violated. If you have questions about the project or how the data will be used, please feel free to ask the researcher any questions.

Certification of Consent:

I was informed and understand what the project is and how my data will be used. Thus, by signing below, I give my consent to participate in this project.
Signature of participant:

Date: _____ / _____ /
    Month / Day / Year

APPENDIX C
Revised LEANRNING STRATEGIES QUESTIONNAIRE

Please answer the questions first, before you continue on to the following questionnaire.
1. Sex: male/female (circle one)
2. Grade level: 1st grader/2nd grader/3rd grader (circle one)
3. Age: _____ years old
4. If you have studied English or lived in an English speaking country, please indicate how long it was. _____ years and _____ months
5. You go to preparatory school. Yes/No (circle one)
6. If and only if you have studied a foreign language other than English, please indicate which language and for how long.
   language _____ length of study _____ years and _____ months
7. What language do you study in addition to English at school?

The following list is a list of vocabulary learning strategies. Learning strategies here refer to the methods by which you learn vocabulary. I would like to know what you actually do, NOT what you should do or want to do. I would like you to indicate how often you have used a certain strategy over the last two weeks, irrespective of the skills (i.e. listening, reading, speaking, and writing) and of the place of learning (i.e. school, preparatory school, and home). If you do not use a strategy at all, please circle the word *never*. If you use a strategy, please circle one of the words, *seldom*, *occasionally*, *often*, *usually* or *always*, according to the frequency. These words mean: *never* (0%); *seldom* (rarely, 20%); *occasionally* (40%); *often* (60%); *usually* (80%) and *always* (100%). If you use a bilingual dictionary 80% of the time when learning vocabulary, for example, please circle the word, *usually* the following way:
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%
If you want to correct the circling, please delete it and circle your best choice clearly. Also, please do not circle in between the items. Circle only one of the words. In this questionnaire, these are no correct or wrong answers. Also, there is no restriction or rule that you cannot use one particular strategy simultaneously with another one. They are not mutually exclusive. For example, if you use both a bilingual dictionary and a monolingual dictionary 60% of the time when you try to learn vocabulary, please circle the word, *often* in the items 29 and 43 below. This way, please indicate the frequency of the strategies you use.

1. Paraphrase the word's meaning by yourself
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

2. Listen to tape of word lists
 never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

3. Guess from textual context in reading
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

4. Use an English-language TV program
 never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

5. Associate the word with its coordinates
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

6. Ask an AET for a paraphrase or synonym
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

7. Learn words written on commercial items
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

8. Ask an English conversation school teacher for paraphrase or synonym
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

9. Put English labels on physical objects
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

10. Use an English language video
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

11. Use English-language songs
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

12. Ask Japanese teacher to check your flash cards or word lists for accuracy
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

13. Learn by group work in class
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

14. Read an English-language newspaper
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

15. Use English-language internet
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

16. Connect the word to its synonyms and antonyms
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

17. Use spaced word practice
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

18. Test with your parents
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

19. Ask an AET for a sentence including the new word
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

20. Do written repetition
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

21. Learn by pair work in class
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

22. Use new word in sentences
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

23. Study and practice meaning in a group outside of class
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

24. Connect word to already known words
never   seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

25. Ask your parents for Japanese translation
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

26. Learn the words of an idiom together
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

27. Use the vocabulary section in your textbook
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

28. Take notes in class at high school
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

29. Use a thesaurus
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

30. Memorize the meaning of affix and roots
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

31. Use semantic maps
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

32. Use picture dictionary
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

33. Ask your brothers or sisters for Japanese translation
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

34. Take notes in class at preparatory school
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

35. Group words together within a stroryline
never seldom   occasionally   often   usually   always
 0%   20%   40%   60%   80%   100%

36. Keep a vocabulary notebook

never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

37. Imagine word's meaning
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

38. Connect word to a personal experience
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%
39. Listen to an English-language radio program
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

40. Use 'scales' for gradable adjectives
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

41. Ask your uncle or aunt for Japanese translation
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

42. Use loanwords in study
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

43. Use a bilingual dictionary
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

44. Do verbal repetition
never seldom   occasionally   often   usually   always
  0%   20%   40%   60%   80%   100%

    Please write any other strategies you have used that are not written above, if any. If there is no strategy you can think of, please give me any comments, or ask me any questions about this questionnaire or my research. Any comments or questions are welcome. I will answer to you via your teacher.

Thank you very much for your cooperation. I will use your answers as effectively as I can.

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