

# **Exploring the Art of Vocabulary Learning Strategies: A Closer Look at Japanese EFL University Students**

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## Foreword

Osamu Takeuchi

Language learning strategy research concerns three major components of language learning: *thinking*, *doing*, and *feeling* (Takeuchi, in press). *Thinking* involves the learner's goal-setting, planning, and reflection, i.e., the learner's decision-making and monitoring processes in learning; *doing* involves the behaviors resulting from the decisions made while learning, and *feeling* involves the management of the emotional aspects of learning. In other words, strategy research covers the major components of language learning inquiry. Researchers in this field believe that, in addition to individual differences such as aptitude and personality, "what learners choose to do also makes a difference in the learning process" (Gu, 2007), thereby giving learners' strategic behaviors "the rightful place they deserve" in theories of L2 learning.

Dr. Mizumoto's treatise, while following the aforementioned line of L2 strategy research, pays special attention to the *thinking* and *doing* components of vocabulary learning in the context of Japanese EFL learning. In addition, Dr. Mizumoto focuses on a vocabulary strategy instruction that could help learners broaden their English vocabulary. Vocabulary learning has been a matter of serious concern for many Japanese EFL learners, because the Japanese language does not share any phylogenetic origin with English. Moreover, its orthographic system is completely different from that of English. Therefore, vocabulary learning poses an enormous challenge to Japanese EFL learners. I am certain that the studies reported in this book will help Japanese as well as other EFL learners overcome this challenge.

This treatise has also contributed a great deal in terms of research methodology. Although Dr. Mizumoto is a wizard in statistical analysis, he is not content with the quantitative line of analysis and includes a qualitative approach in this book, thereby testing

the possibility of mixed methodology (e.g., Tashakkori & Teddlie, 1998) or triangulation of research methods in strategy research. Since studies in this field tend to swing to either the quantitative or qualitative extreme of the methodological continuum, his effort to combine both approaches, although still in its initial stage, deserves generous applause.

His treatise, I am positive, is a landmark in vocabulary learning strategy research in the context of Asian EFL learning. The empirical findings and the methodological contribution found in this book, along with the extensive and well-balanced review of related literature, will surely make it a must read for all those interested in vocabulary learning strategies.

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I am also grateful to the three professors on the Doctoral Committee for my dissertation: Professor Tomoko Yashima, Professor Kiyomi Yoshizawa, and Professor Naoko Ozeki. It is a great honor for me to have an opportunity to receive expert comments on this dissertation from these prominent researchers. Their professional articles and books have inspired and guided me at several occasions during the research process.

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I would also like to thank many students at several institutions who have been involved in the studies reported in this dissertation. They have given me invaluable learners' voices, which I could not have ever imagined or learned from books. Their voices have been a pillar of strength in continuing my research.

On a personal note, I am thankful to my parents, Sueo and Shoko, for—among many things—teaching me to love books and giving me the best education they could possibly provide. Especially, I would like to dedicate this dissertation to my father, who passed away without knowing that his son would one day become a researcher and complete his Ph.D. thesis.

Finally, I would like to thank my wife, Aki, for her unwavering support, patience, and encouragement during my first endeavors as a professional researcher and practitioner.

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## **Chapter 1: Introduction**

Vocabulary is one of the smallest and the most important components of a language. As is often cited in the literature, “Without grammar, very little can be conveyed. Without vocabulary, nothing can be conveyed” (Wilkins, 1972, p. 11). As such, it is also one of the most important aspects in foreign language learning. Whether the learner will be successful or unsuccessful in acquiring a foreign language depends on whether he/she can master a certain amount of vocabulary (Nation, 2001). In fact, the importance of vocabulary learning has been widely recognized thanks to a number of recent studies and comprehensive volumes that synthesize research findings (Bogaards & Laufer, 2004; Coady & Huckin, 1997; Huckin, Haynes, & Coady, 1993; Nation, 1990, 2001; Read, 2000; Schmitt, 2000; Schmitt & McCarthy, 1997).

For learners of English as a Foreign Language (hereafter EFL), vocabulary learning can be considered a never-ending process. At the same time, learners always feel that the dearth of vocabulary prevents them from reaching a higher level of English proficiency, and as such, vocabulary learning is one of the most challenging tasks they face (Gan, Humphreys, & Hamp-Lyons, 2004).

Especially in Japan, an input-poor EFL environment, vocabulary learning tends to be discrete in the same way as in other Asian EFL settings (e.g., Gu, 2003a): Once students step out of the classroom, they simply do not need to speak or listen to English. In Japan, as of now, students usually start learning English in the first year of junior high school (7th grade), and textbooks at junior and senior high schools provide almost the entire source of English input for students. However, since the current edition of the “Course of Study” (Ministry of Education, Culture, Sports, Science and Technology, 2003)<sup>1</sup> restricts the amount of new vocabulary which can be introduced in junior high school textbooks (about 900 words) and high school textbooks (about 1800 words), it has often been pointed out

(e.g., Aizawa & Mochizuki, 2003) that the amount of vocabulary learners know is not necessary, especially for taking high-stakes tests such as university entrance examinations, Eiken (English Proficiency Test), TOEIC, and TOEFL (Chujo & Nishigaki, 2003). The new Course of Study, which will be enforced gradually from 2009 to 2011, stipulates that English education starts at the 5th grade, and a total of 70 hours (35 hours a year) of teaching English be conducted at the primary school level. With 70 more hours of teaching, however, we cannot expect enough vocabulary growth for Japanese EFL learners.

Research on vocabulary acquisition reports that in order to understand a text or learn vocabulary incidentally, understanding 95% to 98% of the words used in the text is a prerequisite (Nation, 2001). Also, approximately 3,000 word families (i.e., words such as “happy,” “unhappy,” “happiness,” “unhappiness,” and “happily” are counted as one word) or 5,000 individual word forms are considered necessary to comprehend the text (Laufer, 1998). However, these conditions are rarely met because, as mentioned above, students learn only about 2,700 words (900 in junior high school and 1,800 words in senior high school) from the textbooks. This, of course, means that incidental learning is highly unlikely, because students depend only on the textbooks for vocabulary input. Thus, it is natural for learners to individually work on enhancing their vocabulary knowledge (e.g., vocabulary size and depth) and bridging the vocabulary gap by employing vocabulary learning strategies. The importance of vocabulary learning strategies in Japan is fully reflected in a study by Takeuchi (2003b) that describes successful EFL learners in Japan. In Takeuchi’s study, vocabulary learning strategies emerged among a repertoire of strategies for the other four skills, namely, listening, reading, writing, and speaking.

Following decades of a “neglecting” this aspect of research (Meara, 1980), we have witnessed an explosion of studies into vocabulary learning and acquisition. Concurrent with this momentum, the development of computational linguistics has further refined research on vocabulary learning and acquisition, especially in the field of corpus linguistics (e.g.,

Biber, Conrad, & Reppen, 1998). This area of research has provided us with insights into what kind of vocabulary learners should know. In other words, what vocabulary learners should learn has become clear to a large extent. However, there is one important piece missing from the vocabulary learning research: *How* learners should learn vocabulary.

No matter how much target vocabulary (*what* to learn) becomes clear, we need to consider *how* learners approach vocabulary learning, since learners are active processors of information (Ellis, 1995). The same can be said from a pedagogical point of view. That is, the number of words we can teach our students directly is so limited that sooner or later we need to prepare our students to take on their vocabulary learning by themselves. After all, it is the individual learners, not the teachers, who do most of the vocabulary learning. For this reason, without paying attention to what the learners actually do on their own, it is not likely that we can promote their vocabulary learning.

As an EFL learner myself, I have always wondered how I can expand my vocabulary effectively. Even after teaching English, this question remains largely unanswered. My interest in research on vocabulary learning strategies comes in part from personal experiences—What kind of vocabulary learning strategies should I use as a learner and teach as a teacher?

In this dissertation, the following general research questions will be addressed:

1. How do Japanese EFL university learners actually approach vocabulary learning by using vocabulary learning strategies?
2. Is it possible to create a psychometrically valid scale of vocabulary learning strategies that truly reflects the construct that it intends to measure?
3. What kind of factors influence the choice and use of vocabulary learning strategies?

4. Does the instruction of vocabulary learning strategies change the learners' strategy use, and if so, in what types of strategies can we observe the changes?

This dissertation includes seven chapters, and it contains a series of four empirical studies focusing on each of the above research questions. Chapter 1, the current chapter, explains the research background that led me to investigate vocabulary learning strategies.

Chapter 2 provides a comprehensive review of literature pertaining to vocabulary learning strategies. Since the literature on vocabulary learning strategies is composed of general learning strategies research and vocabulary acquisition research, each perspective is included in the review. In addition, studies on vocabulary learning strategies instruction, and data collection methods used in the vocabulary learning strategies research are reviewed.

Chapter 3 (Study 1) reports on a close replication of Gu and Johnson's study (1996). This study was conducted in order to grasp the vocabulary learning strategies used by Japanese EFL university learners. A comparison of the results was made in light of the findings in the literature, especially those of Gu and Johnson's study. Also, discrepancies were examined between the vocabulary learning strategies learners actually use and their perceived usefulness (Fan, 2003; Schmitt, 1997). As Study 1 made clear, a psychometrically valid instrument for measuring strategic vocabulary learning should be developed. Study 2 was thus planned to develop and verify the reliability and validity of the measurement instrument.

Chapter 4 (Study 2) describes the development of a psychometrically valid questionnaire (scale) on strategic vocabulary learning for Japanese EFL learners, and university students in particular. Three phases are involved in developing and validating the scale. Validity of the new instrument is further examined in relation to the proficiency measures against (a) the subscales and (b) the overall strategic vocabulary learning capacity,

using confirmatory factor analysis.

Chapter 5 (Study 3) examines the interrelations of vocabulary learning strategies, proficiency measures, motivation, and extracurricular time, all of which are considered to have strong influences on the use of vocabulary learning strategies. In addition to the quantitative data obtained from the questionnaires, qualitative analyses of study logs and interview sessions are also integrated into the quantitative analyses to corroborate the results.

Chapter 6 (Study 4) explores the effectiveness of the explicit instruction of VLS in the regular classroom with Japanese EFL learners. The results of the experimental group and the control group after 10 weeks of VLS instruction are compared. Changes between the learners' initial repertoire of strategies and the strategies they acquire through instruction are also carefully examined.

Chapter 7 summarizes the research findings obtained from these four empirical studies, reflects on their pedagogical implications and suggests avenues for future research. These discussions are centered on moving toward better teaching methodologies for vocabulary learning strategies.

## **Note**

- 1 In Japan, the Ministry of Education, Culture, Sports, Science and Technology establishes curriculum standards as the "Course of Study" for elementary, junior high, and senior high schools. All public schools are supposed to follow their guidelines.

## **Chapter 2: Literature Review**

### **2.1 Research on General Language Learning Strategies**

Research into language learning strategies (or language “learner” strategies<sup>1</sup>) has a history over 30 years long (Cohen & Macaro, 2007). It dates back to studies conducted in the 1970’s, such as Rubin (1975), Stern (1975), and Naiman, Fröhlich, Stern, and Toedesco (1978). These scholars searched for “what good or successful language learners do” to maximize their learning outcomes. The motives behind their undertaking were derived from a healthy pedagogical intent—teaching the models of good/successful learners to less successful ones. After 30 years of practice, we can suppose that the researchers in the field of language learning strategies still have more or less the same good intentions.

The study of language learning strategies, especially in applied linguistics, peaked around the early 1990’s when two of the most influential volumes on this topic were published (O’Malley & Chamot, 1990; Oxford, 1990). As studies on language learning strategies came to the foreground of ESL/EFL research, the definition of language learning strategies was developed (Gu, 1996). O’Malley and Chamot (1990) defined learning strategies as “the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information” (p. 1). Oxford (1990) proposed a more comprehensive definition: “learning strategies are 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). Cohen (1998) further elaborated on the definition of strategies and presented it as “processes which are consciously selected by learners and which may result in action taken to enhance the learning or use of a second or foreign language, through the storage, retention, recall, and application of information about that language” (p. 4). These definitions are the most representative ones and are cited often in the learning strategies literature.

What the three definitions above have in common are that language learning strategies involve the learner's voluntary choice and employment, which Cohen (1998) referred to as "the element of consciousness" (p. 4). The element of consciousness, Cohen assumed, enables us to distinguish strategic learning from ordinary, non-strategic learning. Citing Weinstein, Husman, and Dierking (2000), Dörnyei (2005) offered a view that "*goal-oriented, intentionally invoked, and effortful*" (p. 164, italics in original) are the three characteristic features of learning strategies. Although Dörnyei has difficulty in discerning "strategic" learning from "motivated" learning, one thing in defining language learning strategies is definite—Individual learners make decisions about strategy deployment for the clear purpose of enhancing language learning. The learners therefore voluntarily take on the responsibility of their own learning. This is why strategy training can be effective in fostering autonomous learners (Chamot, Barnhardt, El-Dinary, & Robbins, 1999; Ozeki, 2000).

At present, different researchers have different definitions about language learning strategies (Cohen, 2007). In fact, strategy research specialists acknowledge that the question, "What is a strategy?" is still being asked after more than 30 years of research and practice (Cohen & Macaro, 2007, p. 278). We are thus always in need of providing an operating definition of what we mean by learning strategies in our studies.

Classification schemes for language learning strategies have been proposed by the aforementioned pioneers in this research area. Rubin (1975) first classified strategies (or "processes") as direct and indirect. Direct strategies include (a) classification and verification, (b) monitoring, (c) memorization, (d) guessing/inductive inferencing, (e) deductive reasoning, and (f) practice. Indirect strategies are concerned with (a) creating opportunities for practice and (b) production tasks related to communication. All of these strategies are considered to be processes which would contribute directly or indirectly to learning.

In the same way as the definition of language learning strategies evolved, classification system based on a theoretical framework has also developed. O'Malley and Chamot (1990) based their theoretical underpinnings on Anderson's work (1985) in the information processing theory of cognitive psychology. They divided strategies into three categories: (a) metacognitive strategies, (b) cognitive strategies, and (c) social-affective strategies.

Metacognitive strategies can be defined as "higher order executive skills that may entail planning for, monitoring, or evaluating the success of a learning activity" (O'Malley & Chamot, 1990, p. 44). Cognitive strategies are those that deal directly with incoming information and process it. Examples of cognitive strategies include rehearsal, organization, inferencing, summarizing, deduction, imagery, transfer, and elaboration. These examples clearly show that when we say "language learning strategies," it connotes cognitive strategies, because they are specific learning behaviors for maximizing learning results. Social-affective strategies are used when interacting with other learners (social strategies) and controlling one's affect in learning (affective strategies).

Oxford (1990) also proposed a similar taxonomy by dividing direct and indirect categories into six subcategories. Direct strategies are composed of (a) memory strategies, (b) cognitive strategies, and (c) compensation strategies, while indirect strategies include (d) metacognitive strategies, (e) affective strategies, and (f) social strategies. This classification system resulted in the development of a language learning strategies questionnaire used worldwide in the 1990's called the SILL (*Strategy Inventory for Language Learning*, Oxford, 1990).

Classification schemes proposed by O'Malley and Chamot (1990) and Oxford (1990) obviously overlap each other, as has been pointed out by some researchers (Dörnyei, 2005; Ozeki, 2000). Among the six subcategories of Oxford's taxonomy, compensation strategies are mainly used when communicating with others (e.g., communication strategies).



Accordingly, Cohen (1998) proposed another classification system which distinguishes language *use* strategies from language *learning* strategies, because these two differ in their functions and psycholinguistic representation (Dörnyei, 2005). Comparing the classification systems, Hsiao and Oxford (2002) also found that language use strategies should be kept separate from language learning strategies. On the basis of previous research on strategy classification (especially findings by Hsiao & Oxford, 2002), Dörnyei (2005) argued that learning strategies should be classified as (a) cognitive strategies, (b) metacognitive strategies, (c) social strategies, and (d) affective strategies. It should be noted here that no matter what type of classification schemes we base our research on, validity of the categorization should be tested as we have yet to reach consensus on the definition of language learning strategies per se.

Recent years have witnessed changes in research trends in language learning strategies. After years of identifying and classifying learning strategies throughout the 1980's and 1990's, a number of researchers rightly called for the need to investigate specific strategies to specific tasks (e.g., Cohen & Macaro, 2007; Gu, 2003b; Hsiao & Oxford, 2002; Macaro, 2001). These calls for task-specific strategies originate in the concern that the term *language learning strategies* covers too broad a concept (Tseng, Dörnyei, & Schmitt, 2006). For example, if we ask our students a general language learning strategy such as “Do you practice the sounds of English?,” they would answer, “Sometimes yes, sometimes no,” or “It depends on the task or situation.” Therefore, as Gu (2003b) has suggested, we need to look at learning strategies used by the learners in terms of how their individual differences (person factor), the task, and the learning context are related with one another.

At the same time, new research endeavors (specific learning strategies) respond to the criticism directed at general language learning strategies research (Dörnyei, 2005; Dörnyei & Skehan, 2003; Kellerman, 1991; Rees-Miller, 1993; Sparks & Ganshow, 1993; Stevick, 1990). However, as mentioned earlier, since the issues of definition and construct validity of

learning strategies have remained unsolved thus far, a clear theoretical framework will also be necessary for researching specific learning strategies. In his search for a revised theoretical framework, Macaro (2006, p. 325) proposed that strategies are located in working memory, and they are differentiated from subconscious activity, language learning processes, skills, leaning plans, and learning styles. Working memory is used for “temporary storage and manipulation of information that is assumed to be necessary for a wide range of complex cognitive activities” (Baddeley, 2003, p. 189). For this reason, working memory can be regarded as facilitating the important function of executing cognitive processes. In line with Macaro’s theoretical framework, Gu (2005, p. 10) described how metacognitive strategies and cognitive strategies function with working memory and long-term memory. Figure 2.1 illustrates Gu’s model. This model is based on the information processing theory and differs from Macaro’s framework in the point that Macaro insists that “learner strategies occur only in working memory and that they become other constructs elsewhere” (Macaro, 2006, p. 327). Still, by basing the identification of language learning strategies on working memory (or information processing), which has an established construct through a number of empirical research findings (Baddeley, 1997), we will have strong theoretical underpinnings for language learning strategies research.

We have seen in the literature that the constructs of language learning strategies are the main sources of criticism, and this has led some researchers such as Dörnyei (2005) to doubt the very existence of language learning strategies. The importance of learning strategies, nevertheless, has been underscored in the fact that they are one of the integral components in self-regulated learning, another crucial concept in learning (Gao, 2007; Tseng & Schmitt, 2008; Zimmerman, 2001). Although we need more research to settle the lack of theoretical rigor, as Grenfell and Macaro (2007) observe, we can claim the following points from the research findings of the general learning strategies research:

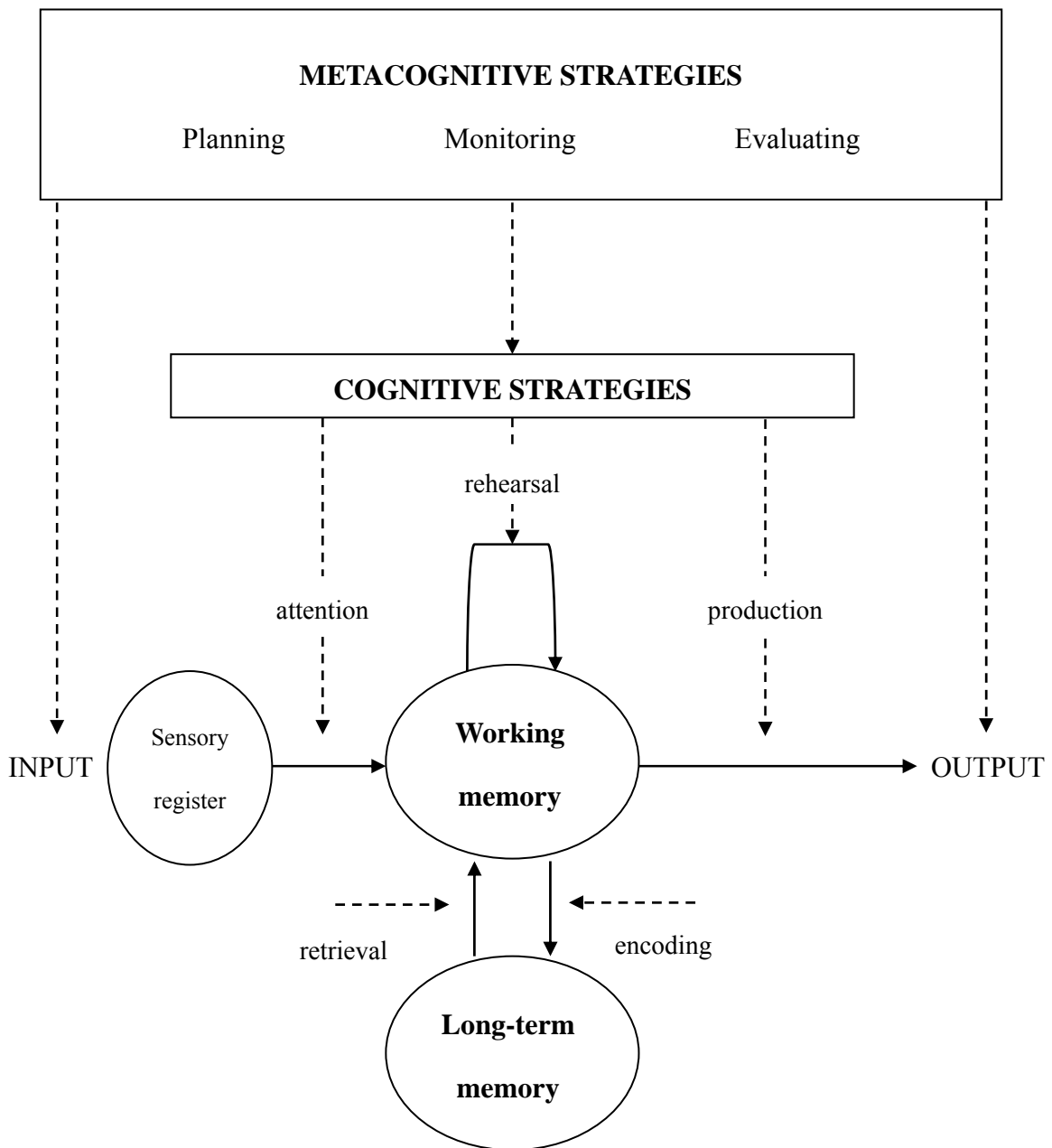


Figure 2.1. Metacognitive strategies, cognitive strategies, and primary processes. From “Vocabulary learning strategies in the Chinese EFL context,” by P. Gu, 2005, Singapore: Marshall Cavendish Academic. Copyright 2005 by Marshall Cavendish Academic. Adapted with permission of the author.

1. The strategies that learners use are accessible and can be documented.
2. A strategy is a construct that can be defined, and what it is and what it does can be described in practical terms.
3. Strategies are important because they are associated with successful learning.
4. Some learner types are more likely to use strategies or use them more successfully than other learner types.
5. Strategies can be taught and learners, as a result, can develop more effective strategic behavior. (Grenfell & Macaro, 2007, p. 27)

## **2.2 Review of Vocabulary Learning Strategies (VLS) Studies**

Research on vocabulary learning strategies (hereafter referred to as VLS) is firmly rooted in two major areas in applied linguistics—vocabulary acquisition and language learning strategies. After years as “a neglected aspect of language learning” (Meara, 1980), the study of vocabulary has witnessed a surge in productive research since 1990 (Coady & Huckin, 1997; Huckin, Haynes, & Coady, 1993; Nation, 1990, 2001; Read, 2000; Schmitt, 2000; Schmitt & McCarthy, 1997). This trend has been propelled partly by cognitive and psycholinguistic research paradigms, which focus on the issues of time and memory, linguistic properties, and text types (Nyikos & Fan, 2007). Concurrently, studies on language learning strategies also became prominent by the early 1990’s (O’Malley & Chamot, 1990; Oxford, 1990).

While vocabulary acquisition research is centered on a description of the process of vocabulary learning, language learning strategies research is learner-oriented, and focuses on investigating how individual learners approach vocabulary learning. Thus, the two research areas are different by nature; however, they tend to be treated as almost the same, because they both deal with “vocabulary learning.” Schmitt (1997) points out this fact by

stating, “(a)ppreciation of the importance of both these areas has led to considerable research in each, yet the place where they intersect—vocabulary learning strategies—has attracted a noticeable lack of attention” (p. 199). Therefore, the following sections present research findings from both vocabulary acquisition and language learning strategies.

### **2.2.1 Classification of Vocabulary Learning Strategies (VLS)**

Since research on general language learning strategies suffers from a lack of theoretical underpinning, VLS research is similarly affected. In other words, we do not know for sure exactly what we mean by VLS. Virtually anything related to vocabulary learning seems to be categorized as VLS in the literature. For example, underlining a word in the textbook with a marker when the teacher tells the students to do so could be a VLS (see Dörnyei, 2005 for this ambiguity in definition).

More importantly, in vocabulary learning, different tasks will require different strategies. Gu (2003b, p. 2) summarizes it best:

Different types of task materials, task purposes, and tasks at various difficulty levels demand different learner strategies. For example, learning words in a word list is different from learning the same words in a passage. Remembering a word meaning is different from learning to use the same word in real life situations.

Schmitt (1997) explains: “strategies are affected by a number of factors, and different intended purposes for a strategy in different situations can affect its classification” (p. 205). The nature of VLS leads to difficulty in classifying it. Simply applying a general language learning strategies classification (e.g., Oxford, 1990) to the whole vocabulary learning process would be impossible in VLS. For this reason, we have come to the conclusion that the “(c)lassification of VLS has achieved only mild consensus to date” (Nyikos & Fan, 2007,

p. 254).

Considering different tasks (purposes of learning) requires different strategy sets, and the most appropriate classification scheme would reflect the tasks and learning purposes under examination. Schmitt (1997) was insightful enough to propose a categorization scheme which contains these perspectives. He utilized Oxford's (1990) taxonomy and added a new category so that the overall taxonomy can be divided into discovery strategies (initial discovery of a word's meaning) and consolidation strategies (remembering the word once it has been encountered). Gu and Johnson (1996) compiled a VLS questionnaire in which they included two major categories: metacognitive and cognitive. Figure 2.2 illustrates the taxonomy integrating the categories proposed by Schmitt (1997) and Gu and Johnson (1996).

As shown in Figure 2.2, *Discovery strategies* concern the strategies used when the learners encounter an unknown word in reading or listening: They guess or infer its meaning from the context (Guessing strategies), look it up in a dictionary (Dictionary strategies), or ask others (Social strategies) to find out the meaning of the word.

Some learners then go on to commit the word to memory by employing *Consolidation strategies*. First, learners may take notes in a margin or space between the lines, on a vocabulary notebook, vocabulary card, or piece of paper (Note-taking strategies). Next, they may repeat (rehearse) the word a number of times (Cognitive strategies, or Rehearsal strategies in Gu & Johnson, 1996), which is considered to be a shallow and mechanical means of processing (Schmitt, 2000). Some learners may proceed to actively manipulate information using elaborate techniques such as mnemonics (Memory strategies, or Encoding strategies in Gu & Johnson, 1996). The difference between Cognitive (Rehearsal) strategies and Memory (Encoding) strategies is whether the "dual-coding theory" (Paivio, 1986) or "depth of processing theory" ( Craik & Lockhart, 1972; Craik & Tulving, 1975) is involved or not. Cognitive (Rehearsal) strategies do not require

manipulative mental processing, which often indicates they are shallow and mechanical processing with rote repetition. On the other hand, Memory (Encoding) strategies are seen as strategies involving deep processing. It should be noted, however, that in recent years it has been recommended that both Cognitive (Rehearsal) strategies and Memory (Encoding) strategies be combined and termed simply “Cognitive strategies” in the general learning strategy literature (Dörnyei, 2005; Hsiao & Oxford, 2002). The final stage of Consolidation strategies is using the word actively in writing or speaking (Activation strategies).

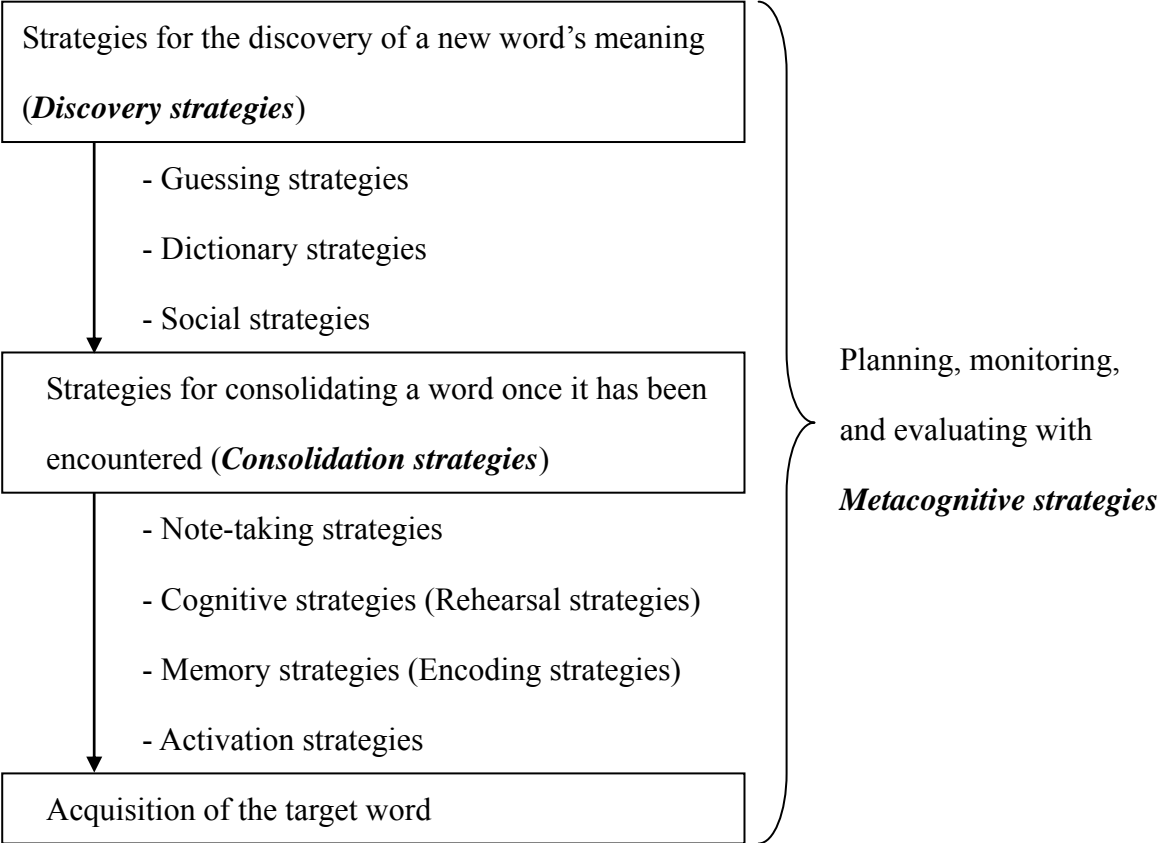


Figure 2.2. Classification of VLS (Based on Gu & Johnson, 1996 and Schmitt, 1997).

When comparing Gu and Johnson (1996) and Schmitt (1997) in terms of the classification of *Metacognitive strategies*, we can find some differences. Although Schmitt's taxonomy (1997) includes strategies such as "Using English-language media" or "Testing oneself with word tests," Gu and Johnson (1996) treat Metacognitive strategies (precisely "Metacognitive Regulation") as overarching strategies that control the whole process of vocabulary learning by planning, monitoring, and evaluating the cognitive strategies. Gu (2003b) states that "(e)ach of these task stages demands metacognitive judgment, choice, and deployment of cognitive strategies for vocabulary learning. And each strategy a learner uses will determine to a large extent how and how well a new word is learned" (p. 3). Since the original meaning of metacognitive strategies is congruent with Gu and Johnson's interpretation, metacognitive strategies should not be restricted only to the consolidation stage of vocabulary learning (see Figure 2.2).

Interestingly, there is no mention of *Affective strategies* in the literature on VLS taxonomies. Affective strategies involve "taking control of the emotional (affective) conditions" (Dörnyei, 2005, p. 169), and the same concept is present in the "self-regulating capacity in vocabulary learning scale" by Tseng, Dörnyei, and Schmitt (2006). In Macaro's theoretical framework anchored in working memory, he asserts that affective strategies are part of metacognitive strategies. Clearly, more research is needed to clarify the taxonomy of VLS.

In summary, even though we have not reached a consensus regarding the clear-cut classification of VLS, Discovery and Consolidation strategies and their sub-strategies (Figure 2.2) would encompass different strategies required for different tasks. The following sections will focus on each category (Discovery and Consolidation strategies) and the findings presented in the previous research related to each sub-strategy (based on Figure 2.2) will be described in detail.



## 2.2.2 Discovery Strategies

### *Guessing strategies*

The first thing learners do when they encounter an unknown word is guess or infer the word's meaning from context. Guessing strategies include guessing the word's meaning from contextual clues, analyzing its part of speech, detecting affixes or roots, and checking for L1 cognate.<sup>2</sup> As Nyikos and Fan (2007) report "(m)ost contextualized vocabulary inferencing strategies are covered in the reading comprehensive literature." Guessing strategies are closely examined in relation to incidental (implicit) vocabulary learning from reading. This mode of learning is often compared with intentional (explicit) vocabulary learning (e.g., Wesche & Paribakht, 1999).

In general, guessing strategies are considered effective in vocabulary learning. Part of this argument comes from L1 reading research that shows most native speakers of English learn vocabulary by guessing from context (e.g., Nagy, Herman, & Anderson, 1985; Nattinger, 1988). This may not be the case with ESL/EFL learners, but a more convincing reason has been proposed: Meanings inferred from context tends to be remembered better than meanings given in a decontextualized list (Hulstijin, 1992; Hulstijin, Hollander, & Greidanus, 1996). In addition, natural context provides learners with proper grammatical usage or collocations (Lewis, 1993, 2002), which leads to better retention of words. In contrast, learners may rapidly forget the words memorized from word lists (Oxford & Scarcella, 1994). For these reasons, guessing from context is considered to be very important in promoting vocabulary retention (Groot, 2000).

However, depending on guessing from context alone for vocabulary acquisition in ESL/EFL learning environments is neither a realistic nor an advisable approach. That is because (a) the prerequisites for incidental vocabulary learning (guessing from context results in success and consequently the word is learned) are rarely fulfilled, and (b) learning efficiency from guessing from context is considerably low.

First, incidental vocabulary learning by guessing from context presupposes that several requirements have been met, conditions that are practically impossible for beginner level learners in input-poor environments such as Japan. For successful guessing (enough reading comprehension) and incidental vocabulary learning, 95% (Laufer, 1992; Liu & Nation, 1985) to 98% (Hu & Nation, 2000) of all the words in the text need to be understood. Otherwise, guessing may lead to wrong meanings (Hulstijn, 1992) and the correct guessing rate may be low (in Nassaji's study, 2003, it was 26%). Moreover, learners often ignore unknown words or avoid guessing them because of their inadequate vocabulary knowledge (Hulstijn, Hollander, & Greidanus, 1996). It has been suggested in the literature that exposure of between 5 to 16 times is necessary to learn a word from context (Nation, 1990). In Horst, Cobb and Meara (1998), gains were reported for words which appeared eight times or more. Of course, the number of times a word appears will not necessarily be a reliable index of incidental vocabulary learning. Other factors, such as how many contextual clues are provided, would matter even more. Nevertheless, we can assume that an adequate amount of word repetition in context is not ensured in EFL textbooks. Previous research suggests that in practice incidental vocabulary learning by guessing from context is unlikely to be the primary source of vocabulary learning for EFL learners.

Second, guessing from context can be very conducive to vocabulary learning and incidental learning could happen (Day, Omura, & Hiramatsu, 1991), yet the rate of such learning is considerably low in EFL settings (Gu, 2003b). This is observable especially in comparison with explicit vocabulary learning (or instruction). For example, Laufer (2003) argued that the amount of vocabulary learned with guessing from context (reading) is far lower than the words learned from explicit vocabulary tasks. Investigating a graded reader for extensive reading, Waring and Takaki (2003) reported that very little vocabulary can be learned from extensive reading (precisely, only one out of 25 words after three months and none if the words appeared fewer than eight times). As some researchers (e.g., Horst, 2005;

Waring & Takaki, 2003) point out, the benefits of extensive reading (or guessing from context) may lie not in the vocabulary gains or retention, but in expanding the depth of vocabulary knowledge of already known vocabulary.<sup>3</sup> In fact, Nation (2001) and Folse (2004) argued that intentional learning from a word list may be more effective for vocabulary learning than learning by guessing from context. Laufer and Shmueli (1997) provided evidence that words presented in lists and in sentences were remembered better than words presented in text and elaborated text. They thus concluded that less information was better when it comes to remembering vocabulary.

The literature on vocabulary acquisition and reading comprehension research has yielded the same insights—guessing from context (reading) plus explicit vocabulary learning tasks (learning or teaching) are conduits to vocabulary acquisition (Hunt & Begler, 2005; Paribakht & Wesche, 1997; Zimmerman, 1997). For example, Nagy and Herman (1987) stated that explicit forms of instruction are more effective than guessing meanings from context. Since the significance of attention to the form of input has been emphasized in second language acquisition research (e.g., Fotos, 1993; Robinson, 1995; Schmidt, 1993 1995), “noticing” the target vocabulary and its forms surely enhances vocabulary learning. Hulstijn (2001) added to this that “(t)he more a learner pays attention to a word’s morphological, orthographic, prosodic, semantic and pragmatic features and to intraword and interword relations, the more likely it is that the new lexical information will be retained” (p. 285). Accordingly, it does not really matter whether the instruction or learning is implicit or explicit. The bottom line is that combining each mode of instruction or learning will likely result in a better chance of noticing and learning vocabulary. Considering learning efficiency, a number of researchers suggest that teaching vocabulary out of context should occur during the early stages of learning<sup>4</sup> and guessing from context (context-bound vocabulary learning) should take place in later stages (e.g., Coady, 1997; Meara, 1997; Nation & Newton, 1997; Schmitt, 2000; Sökmen, 1997).

To sum up, guessing from context (or incidental vocabulary learning) alone will not be an adequate source of vocabulary growth in EFL environments. Of course, guessing from context through extensive reading should be encouraged for advanced-level learners, because it offers learners opportunities to expand the depth of familiar words and recognize words faster (automaticity). The most important thing to keep in mind is to strike a good balance between guessing from context and explicit vocabulary learning tasks. After all, as Folse (2004) mentioned, “a coping strategy for understanding a word in a reading passage, such as guessing from context, is not necessarily a good strategy for learning words ... it is not a particularly effective vocabulary *learning* strategy” (p. 88). In explicit vocabulary learning, the first step a learner takes is to check the meanings of words. The next section will focus on dictionary use and how it will aid vocabulary learning.

### ***Dictionary strategies***

In the VLS literature, dictionary use strategies have often been reported as part of research interest (Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Schmitt, 1997). Still, it should be maintained that the main purpose of consulting a dictionary is to look up a word meaning, and vocabulary learning is a secondary aim. As a matter of fact, “little research has been conducted on the strategies used by learners when consulting a dictionary for the purpose of vocabulary growth” (Nyikos & Fan, 2007, p. 264). Since dictionaries can provide learners with wealth of information about words as a reference source, researchers (e.g., Nation, 2001) often include dictionary use in VLS.

Guessing from context would result in better vocabulary learning when combined with explicit learning, and research findings have shown that using a dictionary rather than reading alone aids in vocabulary learning (Knight, 1994; Luppescu & Day, 1993). Takeuchi (2003b) found that successful learners in Japan first guess the word meaning and then they check it later in a dictionary to make sure the guess is correct. Likewise, Gu (2003a)

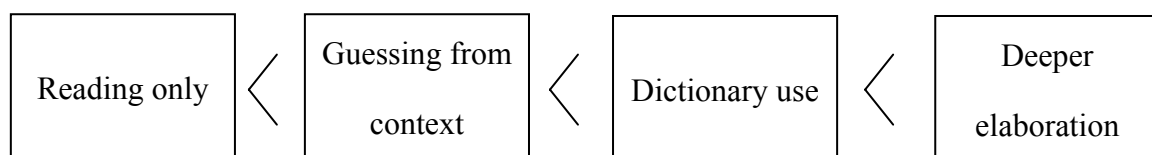
reported that one successful learner focused on not only the word's meanings but also its proper use in context. These behaviors may constitute the elements of *vocabulary learning strategies*, because these successful learners intentionally and voluntarily use dictionaries for vocabulary acquisition later on. Also, these findings are in line with the notion that the learners' proficiency is an important factor when evaluating dictionary usage in vocabulary acquisition (Hulstijin, 1993; Knight, 1994).

Previous research on dictionary use has been conducted to search for maximizing learning results, such as better comprehension of the reading text and production in writing or speaking. As for the types of dictionaries (monolingual or bilingual), for learners below the advanced level, researchers recommend using bilingual dictionaries (Folse, 2004; Gu, 2003a; Nation, 2001) based on empirical research findings (e.g., Laufer & Shmueli, 1997) showing that “vocabulary learning is much more effective using L2-L1 pairs than through L2-L2 definition pairs” (Nation, 2001, p. 290). In contrast, some researchers (e.g., Baxter, 1980) claim that bilingual dictionaries encourage translation, one-to-one correspondence of the word meanings in L1 and L2. Also, they may not provide adequate information on word usage in context. The compromise is another type of dictionary — bilingualized dictionaries. One study by Laufer and Hadar (1997) found “bilingualized dictionaries,” which have features of both monolingual and bilingual dictionaries, are better in vocabulary learning than monolingual and bilingual dictionaries. Since each type of dictionary has strengths and weaknesses, the choice of the types of dictionaries seems to be dependent on the proficiency of the learners and on the purpose of learning.

With the development of computers, there have been a growing number of studies investigating the effect of looking up a gloss or hyperlink on a computer. Compared with paper dictionaries, e-dictionaries (dictionaries in a computer or CD-ROM) do not produce better results in reading comprehension or vocabulary learning (Chun & Plass, 1996; Hulstijin, 1993; Koyama & Takeuchi, 2004; Laufer & Hill, 2000). With e-dictionaries, the

speed (efficiency) and frequency of look-up behavior increases (Nyikos & Fan, 2007). In general, it has been reported that words glossed in L1 are better than words glossed in L2 (Grace, 1998; Laufer & Shmueli, 1997). Chun and Plass (1996) reported that including pictures in addition to the definitions of words resulted in greater vocabulary learning. In Japan, hand-held electronic dictionaries are popular among EFL learners. Research findings suggest that similar results with e-dictionaries have been observed for this specific type of dictionary (Koyama & Takeuchi, 2007). That is, in contrast to paper dictionaries, they do not produce better reading comprehension or vocabulary learning. Nonetheless, e-dictionaries might be promising areas of vocabulary and VLS research because they can include features such as movies and sounds of words, which paper dictionaries could never possibly have.

Figure 2.3 shows the likelihood of vocabulary retention from the simple act of reading to deepen elaboration. The more the learners direct their efforts to unknown vocabulary, the more likely the item is learned. Using a dictionary is deemed essential in learning vocabulary in any language, but at the same time it has been widely acknowledged that learners cannot use it at their disposal with most of the learners only focusing on word meanings and spellings (Nyikos & Fan, 2007). Because using a dictionary involves testing a series of hypotheses, an activity that requires active participation of the learner (Gu, 2003b; Nation, 2001; Scholfield, 1982), learners should be trained to better utilize this indispensable tool.



*Figure 2.3.* Summary of how each strategy could affect vocabulary learning. Likelihood of vocabulary retention increases from left to right.

### ***Social strategies***

In Schmitt's (1997) VLS taxonomy, social strategies are listed as one category of VLS. This is partly because Schmitt based his taxonomy on Oxford's (1990) system. In VLS, social strategies, mainly referring to interacting/collaborating with others, include behaviors such as asking the teacher or others for word meanings, discovering new word meanings through group (pair) work activity, study in a group, and interacting with native speakers of English (the last two are categorized in Consolidation strategies in Schmitt, 1997). The basic concept of social interaction in learning originated with Vygotsky (1978). He asserted that the development of cognition (i.e., learning) takes place in the interaction with other people, especially when input is in the zone of proximal development (ZPD): a level of development attained when individuals engage in social interaction. In the classroom, the teacher or other more capable classmates can give support called *scaffolding* (e.g., van Lier, 2004) to the learners.

It seems that social strategies in VLS have firm theoretical grounds; however, they have been rarely reported in the VLS literature. For example, reviewing more than 30 years of VLS research, Nyikos and Fan (2007) do not mention social strategies in VLS at all. Indeed, only half of 600 students responded that they feel group work is helpful for their vocabulary learning (Schmitt, 1997). As Schmitt (1997) concluded, this is because of "a widespread impression that vocabulary study is an activity best achieved individually" (p. 226). What Schmitt pointed out is supported empirically in Folse's (2004) comment: "Research has shown that learners adopt very individualistic, personalized strategies for dealing with new vocabulary" (p. 100).

If we rigidly follow the definition of learning strategies that strategies are chosen by the learners themselves, some of the social strategies listed in Schmitt (1997) such as "asking classmates for word meanings" may forfeit their status as VLS. More specifically, if the teacher decides the partner for pair work and tells the students to ask each other

questions about vocabulary, the learner does not intentionally do so for vocabulary learning. Thus, much of the VLS use depends on the instructor's teaching style and the individual differences of the learners (e.g., personality, learning environment, and motivation). A learner-centered classroom might encourage interactions and induce social strategies, while teacher-centered classes do not always promote them. On the other hand, learners who willingly work together outside the classroom (e.g., test each other on vocabulary) can be considered wielding VLS.

Although some researchers have recently begun paying attention to the effect of collaborative work on vocabulary learning (e.g., Kim, 2008), research is sorely needed in this area to reveal how social strategies in VLS can be helpful in vocabulary learning, which requires work outside the classroom by the individual learners. As researchers such as Nation (1977) and Schmitt (1997) suggest, we might need to consider the effectiveness of social strategies in vocabulary learning, provided they are proven useful for learners.

### **2.2.3 Consolidation Strategies**

#### ***Note-taking strategies***

Once learners check the information about a word with the discovery strategies described above, they may keep some sort of written record of the new vocabulary in the form of a notebook, a loose-leaf binder, a vocabulary card, a memo in the margin or between the lines, or a scribble on a piece of paper. By and large, researchers (e.g., Folse, 2004; Gairns & Redman, 1986; McCarthy, 1990; Schmitt & Schmitt, 1995) advocate keeping vocabulary notebooks for facilitating vocabulary learning and learner independence. This is in accordance with the findings reviewed in discovery strategies (guessing, dictionary, and social strategies), which clearly show explicit vocabulary learning/teaching (focus on form) will benefit learners more in terms of vocabulary acquisition than of implicit learning alone.



Schmitt and Schmitt (1995) offered practical and theory-based suggestions on keeping vocabulary notebooks. Based on this Schmitt and Schmitt's model, Fowle (2002) implemented vocabulary notebooks in a secondary school language program in Thailand. In these notebooks, each student recorded new and useful lexical items systematically. The results showed that introducing vocabulary notebooks to the learners made it possible to promote learner autonomy.

Previous studies investigating vocabulary notebooks have indicated that learners need to be guided to skillfully make the most of vocabulary notebooks. For example, McCrostie (2007) examined the notebooks of 124 Japanese university EFL learners and reported that learners have difficulty identifying which words to record and see all the words they do not know as equally important. Another study by Leeke and Shaw (2000) surveyed the learners' vocabulary notebooks after they enter L2 learning environments and reported that the most appropriate listing procedure is one that learners themselves feel worth putting in their time and effort. These findings suggest that we need to provide our students with enough information on keeping neat notebooks in order to maximize their learning outcomes.

Given the widespread belief in the use of vocabulary notebooks, it is reasonable to see the VLS literature dealing with note-taking strategies (Ahmed, 1989; Gu & Johnson, 1996, Kojic-Sabo & Lightbown, 1999; Sanaoui, 1995; Schmitt, 1997). Very few studies, however, have reported how note-taking strategies affect vocabulary learning (Gu, 2003b, p. 10). This is probably due to the fact that note-taking strategies involve so many intertwined processes and behaviors that we are not so sure what we mean by *note-taking strategies*. For example, some learners may just jot down the words several times on a piece of paper without having intention to review them, while others may engage in an elaborate rehearsal with a planned reviewing procedure. The element of choice in VLS is also a problem. Learners may take vocabulary notes just because they are required to do so by the teacher. All of these note-taking behaviors above could be "Yes" to a questionnaire item "I write

down vocabulary in a notebook when I study English.” The complexity of interpreting how note-taking strategies contribute to vocabulary learning is reflected in Nation’s (2001) comment, in which he mentions note-taking strategies as “procedures that integrate strategies” (p. 229). In other words, employing note-taking strategies will entail functions of several VLS at the same time. We therefore need to clarify what constitutes note-taking strategies before we claim that they are in fact an important component of VLS.

VLS research clearly demonstrates that more successful learners take a “structured approach” to vocabulary learning (Sanaoui, 1995). In her study, Sanaoui (1995) found that successful learners are those who take a structured approach to vocabulary learning by systematically and extensively recording lexical items and reviewing them. Thus, as Folse (2004) argues, with regard to note-taking strategies, “what is important to ultimate vocabulary learning here is not so much what is written down initially but rather the number of times that the learner goes back and reviews, or retrieves, information” (p. 102).

### ***Cognitive strategies (Rehearsal strategies)***

The first thing learners undertake when they try to commit newly learned words to memory is most likely repeating them several times (Nassaji, 2003; O’Malley, Chamot, Stewner-Manzanares, Russo, & Küpper, 1985), and unless trained to use mnemonic devices, learners rarely employ them. (Nyikos & Fan, 2007). For example, O’Malley et al. (1985) showed that repetition was used more often than supposedly deeper strategies such as imagery and the keyword method. Thus, the literature review of cognitive strategies (rehearsal strategies in Gu & Johnson, 1996) here deals with such shallow repetition or rehearsal of the words, while memory (encoding) strategies, which will be reviewed in the next section, include some deeper elaborate techniques (e.g., mnemonics). Cognitive (rehearsal) strategies and memory (encoding) strategies are the subcategories of strategies concerning memory. Figure 2.4 illustrates this relationship and how these strategies for

memorizing vocabulary are classified in the literature.

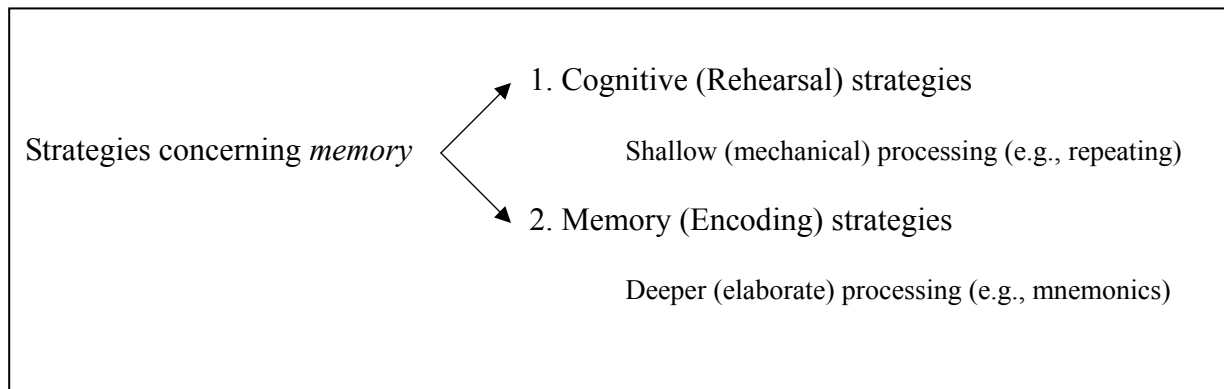


Figure 2.4. The relationship of cognitive (rehearsal) strategies and memory (encoding) strategies in the classification of VLS.

Conventionally, strategies categorized as cognitive (rehearsal) strategies refer to actions such as rehearsal, rote repetition, and visual (silent), oral, or written repetition. In this part of literature review, the words “repetition/rehearsal” will be used to represent cognitive (rehearsal) strategies in VLS.

Nation (2001) provides the following rationale behind the importance of repetition/rehearsal in vocabulary learning:

Repetition is essential for vocabulary learning because there is so much to know about each word that one meeting with it is not sufficient to gain this information, and because vocabulary items must not only be known, they must be known well so that they can be fluently accessed. Repetition thus adds to the quality of knowledge and also to the quantity or strength of this knowledge (pp. 75-77).

When we discuss the role of repetition/rehearsal in vocabulary learning, it tends to mean “decontextualized” learning with word lists or word cards (flashcards). Although some

researchers, such as Oxford and Crookall (1990), criticize decontextualized vocabulary learning and direct teaching,<sup>5</sup> there is an enormous amount of evidence in the literature that shows learners can learn 100 or more words at one time with a decontextualized word list (Gu, 2003b, Schmitt, 2000). Folse (2004) also supports the use of word lists for acquiring a large amount of words quickly if learners prefer them. Since Asian learners are known to have a preference for repetition/rehearsal using a word list because of cultural influences (Gu, 2003b; Oxford & Scarcella, 1994), providing a word list to those learners may direct their attention to subsequent intentional retention/rehearsal of the words (Hulstijn, Hollander, & Greidanus, 1996; Nation, 2001).

Gu (2003b) reported from a literature review that the number of repetitions needed to remember a word list differs from study to study. He concluded that, in general, a relatively small number of repetitions are needed to remember L2-L1 word pairs. Nation (2001) summarized the previous research findings and found research has reported that five to seven repetitions are necessary. Of course, the mechanisms and effectiveness of repetition in vocabulary learning are not so simple that we can assert how many times learners should repeat the words. It also depends on the “learnability” of words (e.g., word concreteness, frequency, or how many meanings the word has).

Research has shown that two factors in repetition largely contribute to the success of vocabulary learning from repetitions: the timing for repetition and the use of retrieval. Since the classic work by Ebbinghaus (1885/1964), memory research and vocabulary acquisition research have gathered very strong empirical evidence that spaced repetition (or expanding rehearsal) yields better retention of words than studying many words at one time (Baddeley, 1997). For instance, in terms of memory it would be better to remember 30 words spaced at increasingly larger intervals than to learn all 30 words at one occasion if the learner spends the same amount of total time. Nation (2001) introduces Pimsleur’s memory schedule (1967), in which time spacing before the next repetition increases exponentially. In fact, Gu

(2003b) argues that “forgetting mostly occurs immediately after initial encounter, and that the rate of forgetting slows down afterwards” (p. 11). Thus, spaced repetition is the most desirable repetition scheduling. Schmitt (2000) suggests an explicit memory schedule with “reviews 5-10 minutes after the end of the study period, 24 hours later, 1 week later, 1 month later, and finally 6 months later” (p. 130). Figure 2.5 illustrates “Ebbinghaus’ Forgetting Curve” and how spaced repetition is scheduled at increasing time intervals to minimize the forgetting.

Another ingredient for success in implementing repetition/rehearsal in vocabulary learning is retrieval of the meaning from memory by looking at the word (Baddeley, 1997). Advocating word cards for intentional vocabulary learning, Nation (1990) argues that retrieving is easier with word cards than word lists or vocabulary notebooks, because learners cannot see the word form and its meaning and have an opportunity to retrieve the meaning from memory. He continues “(i)f lists and notebooks are to be used to help learning, then the meaning needs to be covered up so that learners have the chance to retrieve the item from memory” (p. 306). The importance of retrieval in vocabulary learning has been underscored in a series of empirical research (e.g., Bahrick, Bahrick, Bahrick, & Bahrick, 1993; Barcroft, 2007; McNamara & Healy, 1995). Therefore, the combination of spaced repetition with retrieval seems to be the key to success in vocabulary learning. In this line of research, computer-assisted vocabulary learning (CAVL) is a very promising area (e.g., Nakata, 2008) because it is possible to automatically implement both spaced repetition and retrieval with computer programming.

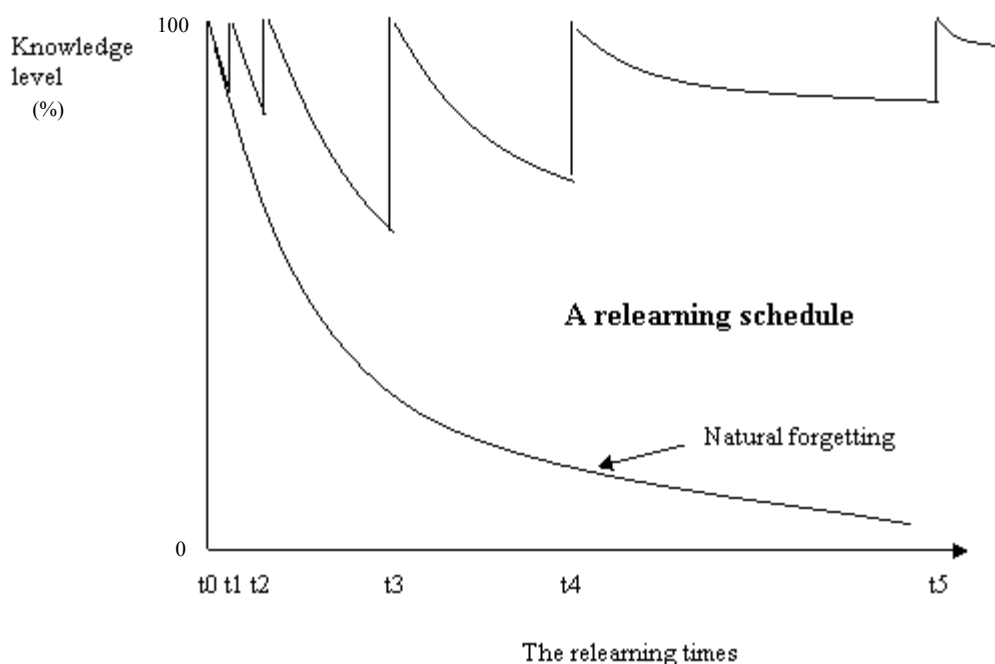


Figure 2.5. Forgetting curve and the effect of spaced repetition. From “In defence of learning words in word pairs: But only when doing it the ‘right’ way!,” by R. Waring, 2004. Copyright 2004 by Rob Waring. Reprinted with permission of the author.

In addition to the fundamental importance of using retrieval of the words from memory, repetition/rehearsal also aids in building a large sight vocabulary (Sökmen, 1997) so that learners can develop automaticity of word recognition (Hulstijin, 2001). Sight vocabulary refers to words that learners can recognize easily and quickly, and it is almost equivalent to automaticity. Research investigating eye movement in the process of reading has confirmed that we look at almost all the words in the text (Rayner & Balota, 1989). That is, the act of reading is largely dependent on sight vocabulary. If learners have a large sight vocabulary, they would be able to read the text rapidly as well. The significance of a large sight vocabulary has been recorded in a good language learner study by Takeuchi (2003b). In his study, it was found that successful language learners in Japan “seem to think much of increasing basic vocabulary to a certain level (about 2500 words) at the beginning stage of

their learning” (p. 388). EFL environments, such as Japan, inevitably make it difficult to acquire large vocabulary naturally, and therefore conscious repetition/rehearsal on the part of learners is a crucial part of developing sight vocabulary.

There are mainly three types of repetition/rehearsal methods—visual, written, and oral repetitions. Several studies have been made on the effect of each mode of repetition/rehearsal, and each has produced different results. The literature has reached a consensus that the most effective of the three is oral repetition (Nyikos & Fan, 2007; Gary & Gary, 1982; Gu & Johnson, 1996; Kelly, 1992). Gu (2003b) summarizes these findings as follows: “Empirical results on this issue are also relatively unanimous, that repeating words aloud helps retention far better than silent repetition” (p. 11). The aforementioned study by Takeuchi (2003b) also provided evidence that successful EFL language learners pay extra attention to pronunciation in their intentional vocabulary learning: “They first checked the pronunciation of a new word and then memorized the word by both reading it aloud and writing it down many times” (p. 388). On the other hand, visual repetition alone has been found to negatively correlate with vocabulary size (Gu & Johnson, 1996).

The superiority of oral repetition/rehearsal to other types of methods can be attributed to how working memory functions (Baddeley, 1997; Ellis, 2001; Service, 1992). Figure 2.6 shows the current multi-component model of working memory proposed by Baddeley (2000). Baddeley (2003) gives the definition of working memory (also known as “short-term memory”) as: “Working memory involves the temporary storage and manipulation of information that is assumed to be necessary for a wide range of complex cognitive activities” (p. 189).

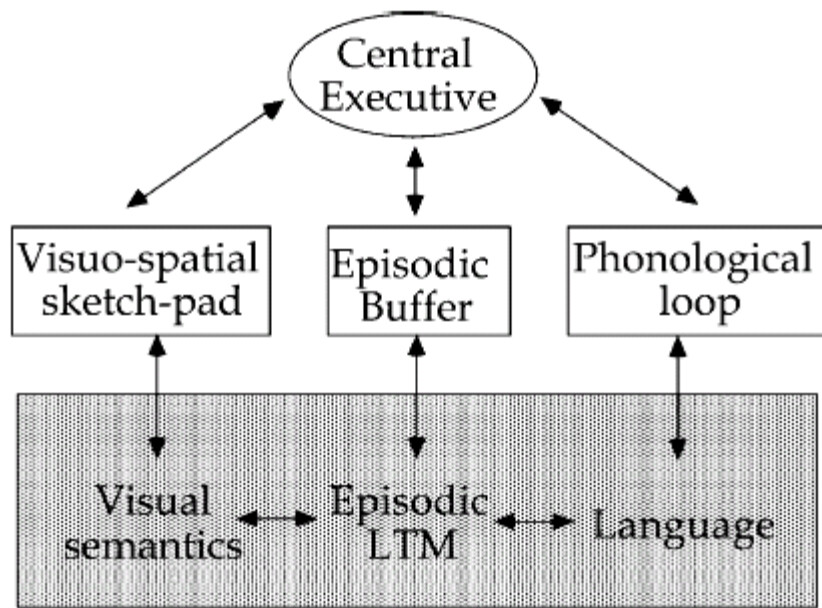


Figure 2.6. The multi-component model of working memory. The shaded area is a long-term memory system which interacts with the working memory system. From “Working memory and language: An overview,” by A. Baddeley, 2003, *Journal of Communication Disorders*, 36, p. 203. Copyright 2003 by Elsevier Science Inc. Reprinted with permission of the author.

In Figure 2.6, shaded areas are long-term memory, which can interact with working memory system above in the figure (the central executive, the visuospatial sketchpad, the episodic buffer, and the phonological loop). As can be seen in Figure 2.6, the central executive, a limited capacity attentional system, controls the three subsystems. Each subsystem deals with different types of information: the visuospatial sketchpad (visual information); the episodic buffer (a temporary storage system combining information from a variety of sources into integrated chunks); and the phonological loop (verbal and acoustic information).

When learning new vocabulary, the phonological loop is used to hold and manipulate



the verbal and acoustic information of the new vocabulary (Baddeley, Gathercole, & Papagno, 1998). As Takeuchi (2003a) summarizes, some of the words rehearsed well in the working memory will be transferred consequently to long-term memory. This explanation fits neatly with the findings of some empirical studies (Ellis & Sinclair, 1996; Papagno, Valentine, & Baddeley, 1991) that showed that if the performance of the phonological loop was impaired, foreign language learning was disrupted to a large extent. It may be concluded that intentional oral repetition/rehearsal facilitates foreign vocabulary language learning.

In Schmitt's (1997) study, written repetition, together with verbal repetition, was most often used among 600 Japanese EFL learners. In spite of the predominant use of written repetition/rehearsal in Asian learners (e.g., Yang, 2005), very few studies have reported how it affects on vocabulary learning. This may be because written repetition in general is not treated as consolidating strategy, but as part of "note-taking" strategies. Written repetition, however, may have a different meaning to Japanese EFL learners. This is best summarized by Naka and Naoi (1995):

the purpose of repeated writing is to learn the items by heart while writing, but not to make an external prompt or a reminder note for later use; that is, it is the writing action itself, not the output, that is important. (p. 201)

As reviewed in the earlier section of note-taking strategies, it takes more than just writing in order to skillfully implement note-taking strategies. In note-taking strategies, therefore, the most important thing may be to review and retrieve vocabulary to be remembered.

As for the effects of written repetition on vocabulary learning, Naka and Naoi (1995) examined whether written repetition leads to better vocabulary learning. In part of their experiments, they compared the effects of writing repetition and visual repetition on (a)

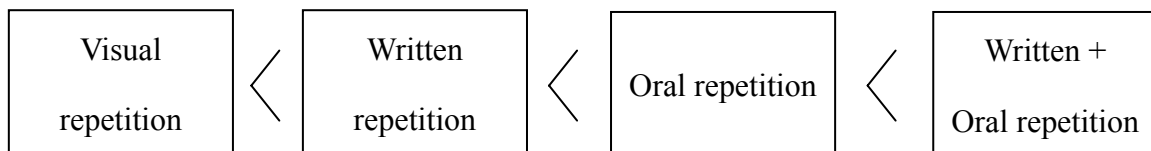
English words, (b) pseudo words, (c) non-words, and (d) graphic designs. They found that while writing repetition worked well for remembering graphic designs (the recall rate was better than visual repetition), writing repetition (and visual repetition) did not facilitate the recall of other items (i.e., English words, pseudo words, and non-words). Naka and Naoi speculated that meaningless graphic designs may not be encoded semantically or phonetically; thus, only with written repetition, the encoding of visual information of graphic designs can be facilitated. The most profound implication of this study is that writing repetition may not help remember vocabulary as much as many Japanese EFL learners think so.<sup>6</sup>

One reason for the predominant use of written repetition/rehearsal among Japanese EFL learners may probably be the learning of *Kanji*, or Chinese characters used in the modern Japanese writing system, throughout the period of compulsory education (six years of elementary school and three of junior high school). Japanese elementary school students learn more than 1,000 Kanji characters in six years. In learning them, written repetition is considered most useful by many teachers and parents (Akamatsu, 1998). For this reason, there is a possibility that the strategy of written repetition for learning Kanji characters transfers to English vocabulary learning when children start learning English upon entering junior high school from the 7th grade.

The problem in simply applying written repetition to English vocabulary is derived from the differences in orthographic and its corresponding phonological features of Kanji characters and English. Kanji characters do not contain much phonological information, while English has visually accessible phonological information (Akamatsu, 1998; Koda, 1990). As mentioned above in Naka and Naoi's (1995) study, writing repetition has been proven more appropriate for remembering graphic designs that contain little phonological information. Consequently, Japanese EFL learners may employ written repetition for learning English vocabulary without noticing differences in the phonological features.

Moreover, while engaged in written repetition they may not pay enough attention to saying the word aloud (oral repetition), which actually should be utilized considering the functions of working memory. Interestingly, it has been reported that the learners of Japanese (as a second or foreign language) start using written repetition in studying Kanji characters (Grainger, 2005).

Figure 2.7 exhibits how different types of repetition/rehearsal strategies could affect vocabulary learning. Research has shown the positive effects of oral repetition/rehearsal over visual and written counterparts. Although written repetition/rehearsal may not contribute to vocabulary learning as well as oral repetition/rehearsal, there has been growing interest, particularly in Japan, in reading aloud (oral) while writing words repeatedly (e.g., Kitamura, 2007). Since researchers in general have tended to underestimate the effectiveness of repetition/rehearsal strategies (Gu, 2003b), we need additional empirical evidence that shows how each type of strategy could be helpful in vocabulary learning.



*Figure 2.7.* Summary of how different types of repetition/rehearsal strategies could affect vocabulary learning. Likelihood of vocabulary retention increases from left to right.

### ***Memory strategies (Encoding strategies)***

Repetition/rehearsal is frequently used by learners and when employed properly is reasonably effective in terms of the mechanisms of memory. Learners, however, may often need deeper processing strategies than repetition/rehearsal in order to commit the newly

learned words to memory. Memory (encoding) strategies described in this section are also referred to as mnemonics, techniques for improving the memory. Memory (encoding) strategies possibly used by learners include using imagery (pictures), the keyword method, related words or unrelated words, grouping, collocations or lexical chunks (Lewis, 1993), and word parts (affixes/roots). There are also other lesser known memory strategies (Schmitt, 1997) such as using physical action, rhymes of the word, and the loci method (used when remembering a list of things by connecting well-known locations to the things to be remembered). Broadly speaking, any strategic behavior related to elaborate processing of word information can be categorized as memory (encoding) strategies.

There has been abundant research on memory strategies since the 1970's. Two theoretical rationales are the main drive behind the whole line of memory strategies. The first one is the dual-coding theory (Paivio, 1986). The dual-coding theory postulates that both visual (imaginal) and verbal forms of information are processed differently using independent channels. Thus, when both forms of information are connected, it will be easier to retrieve the information and develop deeper understanding of the information. If learners use imagery of the words to be remembered in vocabulary learning, the likelihood of later recall will be enhanced, compared with learning the same item only with verbal information (Sökmen, 1997). This theory has been quoted in the studies reporting how imagery of the word can be beneficial to vocabulary learning (e.g., Chun & Plass, 1996; Nyikos, 1990; Rodríguez & Sadoski, 2000).

Second, the depth of processing theory ( Craik & Lockhart, 1972; Craik & Tulving, 1975) has also contributed to the advancement of this line of studies with many researchers basing their hypotheses and findings on it. The depth of processing theory posits that when a deeper level of mental processing (e.g., semantic processing) takes place, it may result in a more durable memory trace and possibly being stored in long-term memory. This notion has been supported by several vocabulary researchers in applied linguistics. Specifically,

Hulstijn and Laufer (2001) acknowledge that “retention of new information depends on the amount and the quality of attention that individuals pay to various aspects of words” (p. 541). The difference between the dual-coding theory and the depth of processing theory is the amount of information involved. While the dual-coding theory is concerned with the visual (imaginal) and verbal information, other types of information (e.g., context) could be discussed in the depth of processing theory as long as elaborate processing is involved. It seems that more elaboration is considered conducive to vocabulary learning regardless of different theories. Some of the research findings and their implications related to memory strategies are discussed below.

Among mnemonics, the keyword method (since developed by Atkinson, 1975) has been researched in literally hundreds of studies. The keyword method entails two stages of mental processing. First, a learner chooses an L1 word or phrase which sounds similar to the target L2 word, thereby making an “acoustic link.” Second, the learner creates a mental image that combines the L1 word with L2 word, which is called “imagery link.” For example, in order to remember the L2 word “temperature,” a learner thinks of the L1 word “*tempura*” (a type of Japanese food, mostly fish or vegetables fried in batter) because the word is acoustically similar to “temperature.” Then, an image combining the L1 and L2 words, one in which the learner’s mother is cooking tempura (as seen in Figure 2.8), is created in the learner’s mind. When the L2 word “temperature” is later seen or heard, the acoustic link and the imagery link are reactivated and work as prompts for the L2 meaning.



*Figure 2.8.* An example of the keyword method for memorizing the word “temperature” from a Japanese EFL learner’s notebook.

The results of studies investigating the key word method are so overwhelmingly in support of this method that in effect there is no room for casting a doubt on its effectiveness in memory enhancement (e.g., Atkinson, 1975; Brown & Perry, 1991; Cohen, 1987; Meara, 1980; Nation, 1982; Pressley, Levin, & Miller, 1982; Rodríguez & Sadoski, 2000). Some studies provide evidence that combining the keyword method with using the context produces superior recall of the words (Brown & Perry, 1991; Rodríguez & Sadoski, 2000).

Although the key word method works miraculously as a mnemonic device, its usefulness as a VLS, has come under some criticism. First of all, it takes time and cognitive effort to come up with a good image. If L1 and L2 are linguistically distant, such as Japanese and English, finding similar sounding words will be difficult. On the contrary, if the L1 and L2 are close, this strategy would be very useful. The concern for too much mental effort on the part of learners was pointed out by Sternberg (1987) who criticized the keyword method in his provocative paper entitled “Most vocabulary is learned from

context.” He suggested that such a demanding method will likely be abandoned by learners. This phenomenon is indeed reported in Pressley and Ahmed (1986). They reported that the participants of their study failed to recognize the applicability of the key word method even though they had knowledge about it. In addition, learner resistance to supposedly excellent mnemonics (O’Malley, Chamot, Stewner-Manzanares, Russo, and Küpper, 1985) may be the reason why the key word method has been identified as a negative predictor of language proficiency in Asian EFL settings (e.g., Fan, 2003; Gu & Johnson, 1996). Secondly, not all words are suitable for the key word method (Hulstijn, 1997). It is easier to use the key word method for concrete words rather than abstract words, because creating an image for abstract words (e.g., peace) is difficult. Gu (2003b) summarizes other concerns for the key word method: (a) it emphasizes a one-to-one relationship between form and meaning; (b) word use in natural context cannot be learned; (c) it is much less effective in productive vocabulary learning; and (d) it may not lead to long-term retention.<sup>7</sup> For these reasons, it would be safe to say that the key word method should be employed as a complement VLS, not as the panacea for all the vocabulary learning (Cohen, 1987; Gu, 2003b).

Using related/unrelated words or grouping is another type of memory (encoding) strategies. The basic idea is that by making an association with the target word, learners go through deeper mental processing, which is a favorable condition in the depth of processing hypothesis. For this reason, thinking of the word’s synonyms, antonyms, or homonyms will enhance the recall of the word. Another rationale comes from an L1 study of children’s vocabulary acquisition. Aitchison (2003) supposes that children go through three stages of (a) labeling, (b) packaging/categorization, and (c) network building in their L1 vocabulary acquisition. In the last two stages, it is assumed that semantically related words become part of the network (mental lexicon). Thus, making use of these acquisition processes in L2 vocabulary learning seems worthwhile as well.

Yet, some studies have warned that caution must be exercised when presenting sets of

semantically related words to learners (Erten & Tekin, 2008; Tinkham, 1993; Waring, 1997). These studies found that learning closely related new words at the same time will impede the learning of the new words. For example, if the learner does not know either “obtain” or “acquire,” these synonyms should not be learned at the same time. Synonym-based learning only facilitates language acquisition if the learner knows one of the words. Instead of semantically related words, Waring (1997) advises a thematic arrangement of words to avoid confusing the learner; for example, “sweater, changing room, try on, cash register, wool, navy blue, striped and so on may not show the same interference effects as scarf, tie, coat, pants and skirt for words learned in a lesson on shopping for clothes” (p. 270).

This caveat holds true for using a semantic mapping, a visual framework of connections between ideas (Nation, 2001, p. 129). A semantic mapping or semantic grid is often used as a classroom activity. In implementing this method, semantically related (and unknown) words should be avoided because they might interfere with each other. Although a semantic mapping is included in some VLS research (e.g., Schmitt, 1997), it is mainly a classroom activity or teacher-created task. Therefore, it would be hard to imagine that a learner employs a semantic mapping as VLS by spending all the time and effort (Nation, 1990; Sökmen, 1997).

Using collocations or lexical chunks (Lewis, 1993) could be a memory (encoding) strategy because they have “very powerful and long-lasting links in the lexicon” (Sökmen, 1997, p. 253). This is why a collocation grid (Schmitt, 2000) is often included in vocabulary textbooks (e.g., McCarthy & O’Dell, 1993).

Using word parts (affixes/roots) for vocabulary learning is highly recommended by researchers (Nation, 1990, 2001, Sökmen, 1997). This is based on the fact that “(m)ost of the content words of English can change their form by adding prefixes and suffixes” (Nation, 2001, p. 263). If learners can break a word into parts, the benefits will be twofold: (a) they can guess the meaning of an unknown word and (b) it will be easier for the learners



to remember the vocabulary. For instance, learners can use the knowledge of word parts and divide the word “transportable” into three parts as can be seen in Figure 2.9. Once they can analyze these word parts, other words such as “import,” “export,” and “transportability” would be easy to remember. In addition to word parts knowledge, etymological information will also work as a memory aid.

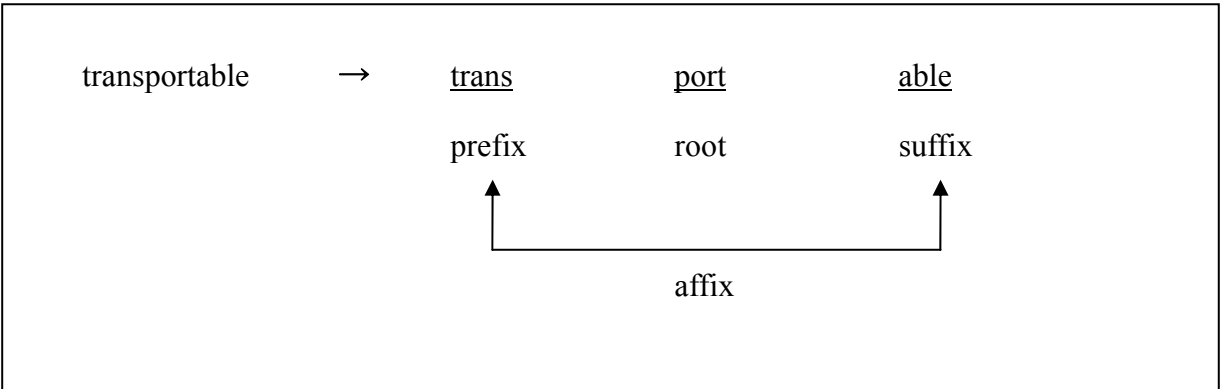


Figure 2.9. An example of word parts of the word “transportable.”

Considering how knowledge of word parts impacts vocabulary learning, it is surprising to see how little research has reported the use of it as a VLS by learners. One explanation for the scarcity of research may be the learners’ vocabulary size (or knowledge in general). Mochizuki and Aizawa (2000) found that the affix knowledge of Japanese university EFL learners correlated with their vocabulary size, and affixes can be put in the order of acquisition. Their findings suggest that without knowing a certain amount of vocabulary at first, making use of the word parts knowledge may be difficult. Because teaching word parts knowledge has been reported to result in positive vocabulary learning (e.g., Nakayama, 2008), more studies are needed in this line of research.

The literature review of memory (encoding) strategies has shown that most of the

studies were conducted based on what the researchers wanted to prove (i.e., some mnemonics actually work for improving memory) and not on what the learners do. Learners have to be proficient enough to make use of memory strategies and those low-level learners cannot use them effectively, and they would mainly rely on repetition (cognitive strategies). Future research thus should be directed to unveil the point at which low-level learners begin to appreciate the usefulness of memory (encoding) strategies.

### *Activation strategies*

The primary purpose of vocabulary learning is using vocabulary in communication (oral and written production). Producing a word involves more than just knowing its meaning. Nation (2001), for example, lists three general components of vocabulary knowledge, including form, meaning, and use. Subcategories of these components include nine different aspects of knowledge, such as associations, grammatical functions, collocations, register, and so on. Each aspect is further broken down into receptive and productive knowledge, resulting in a total of 18 subcomponents of knowledge. Since the strategies described in the previous sections more or less treat vocabulary learning as the acquisition of discrete items, productive use of the words will require greater cognitive effort on the part of the learners. In other words, by going beyond just receptively knowing the words, learners need to get to know other aspects of vocabulary knowledge, which will surely lead to better vocabulary learning. The importance of the conscious use of words in vocabulary learning (activation strategies) is pointed out by Gu (2005). He compared successful and unsuccessful EFL learners in China and concluded that “only active learners who consciously seek to put new words to use (in recognition and/or production) succeed” and “seeing vocabulary as nothing but paired associations between form and definition is a sure way to fail” (p. 153).

As a matter of fact, research has yielded positive results for the productive use of

vocabulary to be learned. Some studies have shown that for vocabulary learning, using “L1 to L2” is more difficult and useful than using “L2 to L1” (Griffin & Harley, 1996; Laufer & Goldstein, 2004; Nation, 2001). This notion is also well in line with the depth of processing hypothesis. Laufer and Hulstijn (2001) proposed the “involvement load hypothesis” for vocabulary learning based on the depth of processing hypothesis in order to respond to the criticisms for it and operationalize the concept of depth of processing. Laufer and Hulstijn (2001) proposed a motivational-cognitive construct of involvement, which is composed of three basic components: need, search, and evaluation. In Hulstijn and Laufer’s study (2001), they compared three learning tasks (reading comprehension, comprehension plus filling in target words, and composition-writing with target words) and how they related to amount of vocabulary retention. The results showed that the composition task produced the highest retention because it had the highest task-induced involvement load.

Writing a sentence using the newly learned words is intuitively more demanding than any other strategy and good for vocabulary retention; nevertheless, there are some conflicting results in the literature. For example, Pressley, Levin, and Miller (1982) reported that sentence writing with the target words did not facilitate vocabulary retention compared to the keyword method (both in production and recall of the definition of words). Using a research design similar to that in Hulstijn and Laufer’s study (2001), Folse (2006) found that fill-in-the-blank exercises resulted in better retention measured with *Vocabulary Knowledge Scale* (Wesche & Paribakht, 1996). He pointed out that in the sentence writing task, there is a confounding factor of the time spent on the task; in other words, it takes three times longer to complete the sentence writing task compared with other tasks. When controlling this time factor, it was reported that the results changed drastically. He also suggested that “the important feature of a given L2 vocabulary exercise is not depth of word processing but number of word retrievals required” (p. 273). Recently, Keating (2008) has reported the research findings supporting the results of Folse’s study.

These arguments have yet to be resolved, so we should remember that telling our students to write a sentence using new vocabulary items may not be as productive as we believe. Another note is that not all words need to be learned for production (e.g., low-frequency words) because those words only need the mastery level of recognition, not recall. These facts should not discourage the use of activation strategies as long as teachers and learners are aware of the pitfalls of some task types. It remains that, without taking the time factor into consideration, sentence writing with target words is the most effective method (Keating, 2008). Depending on the purposes of vocabulary learning, teachers and learners should determine how much time and effort they will put in. Regarding this issue, judicious advice offered by Nation (2001) is for high-frequency vocabulary, learners should be able to use it productively in communication because high-frequency words are worth direct teaching and learning.

#### **2.2.4 Review of Studies on Mixed Use of VLS**

Most of the studies reviewed in the previous sections focus on one type of strategy (e.g., repetition or the keyword method) or task type (e.g., the comparison of guessing from context and dictionary use). This is because researchers were by and large interested in “how students should learn vocabulary” and in searching for a better learning method from the viewpoint of teachers and researchers. In reality, however, individual learners would select and employ a variety of VLS in combination in a highly personalized way, depending on the purpose of their vocabulary learning. Such a learner-centered view of VLS started in the early 1990’s, and since then, the focus has shifted from “how” to the description of “what” learners actually do. Table 2.1 lists the selected studies which have investigated the mixed use of VLS by the learners. Even though teachers and researchers have long been in search of one best VLS, these studies clearly suggest that such a universally effective VLS does not exist (Folse, 2004).

Table 2.1

*Selected Key Studies on Mixed Use of VLS in Chronological Order*

Study	Participants	Instruments	Findings
Ahmed (1989)	300 Sudanese EFL learners	<ul style="list-style-type: none"> <li>• Think-aloud</li> <li>• Observation</li> <li>• Interview</li> <li>• Questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• VLS of successful and unsuccessful learners</li> <li>• Differences were found in:               <ul style="list-style-type: none"> <li>- Discovery strategies</li> <li>- Dictionary use</li> <li>- Note-taking</li> <li>- Cognitive strategies</li> </ul> </li> <li>• More proficient learners used a variety of VLS.</li> </ul>
Lawson & Hogben (1995)	15 Italian as a Foreign Language learners in Australia	<ul style="list-style-type: none"> <li>• Think-aloud</li> <li>• Interview</li> </ul>	<ul style="list-style-type: none"> <li>• Most learners used some forms of repetition strategies.</li> <li>• More frequent and wider variety of VLS use resulted in better retention of words.</li> <li>• Memory strategies are more effective than repetition strategies.</li> </ul>
Sanaoui (1995)	<p>[Study 1] 50 ESL learners (exploratory study)</p> <p>[Study 2] 4 ESL learners &amp; 8 French as a Second Language learners in Canada (case study)</p>	<ul style="list-style-type: none"> <li>• Daily written record</li> <li>• Interview</li> </ul>	<ul style="list-style-type: none"> <li>• Structured or unstructured approach to vocabulary learning</li> <li>• Structured approach is the characteristic of successful vocabulary learning.</li> <li>• Differences were found in:               <ul style="list-style-type: none"> <li>- Opportunities for learning vocabulary</li> <li>- Range of self-initiated activities</li> <li>- Records of lexical items</li> <li>- Review of lexical items</li> <li>- Practice of lexical items</li> </ul> </li> </ul>
Gu & Johnson (1996)	850 EFL learners in China	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• Proficiency measures</li> <li>• Vocabulary size test</li> </ul>	<ul style="list-style-type: none"> <li>• Relationship between VLS use and learning outcomes (proficiency test and vocabulary size test)</li> <li>• Small to moderate correlations between VLS and learning outcomes were found in:               <ul style="list-style-type: none"> <li>- Metacognitive strategies</li> <li>- Guessing strategies</li> <li>- Dictionary strategies (except for comprehension use)</li> <li>- Note-taking strategies</li> <li>- Some memory strategies (Association and Contextual encoding)</li> <li>- Activation strategies</li> </ul> </li> <li>• Visual repetition negatively correlate with learning outcomes.</li> <li>• Five different types of learners were identified according to their VLS use.</li> </ul>

*(Table 2.1 continues)*

(Table 2.1 continued)

Study	Participants	Instruments	Findings
Horino & Ichikawa (1997)	321 Japanese EFL learners (high school students)	<ul style="list-style-type: none"><li>• Questionnaire</li><li>• Achievement tests</li></ul>	<ul style="list-style-type: none"><li>• The effects of motivation on VLS</li><li>• The effects of VLS on achievement tests</li><li>• Among three VLS investigated (organization, imaging, and repetition), only the organization had a significant effect on the achievement tests.</li></ul>
Schmitt (1997)	600 Japanese EFL learners (junior high school, high school, university, adult learners; 150 each)	<ul style="list-style-type: none"><li>• Questionnaire</li></ul>	<ul style="list-style-type: none"><li>• Taxonomy of VLS</li><li>• Differences between the actual use and perceived usefulness of VLS</li><li>• Changes in VLS use across four different stages of EFL learners (from simple to more elaborate strategies)</li></ul>
Kojic-Sabo & Lightbown (1999)	47 ESL learners in Canada and 43 EFL learners in Yugoslavia	<ul style="list-style-type: none"><li>• Questionnaire</li><li>• Vocabulary size test</li><li>• Cloze test</li></ul>	<ul style="list-style-type: none"><li>• Effects of learning environments (ESL/EFL) on VLS use</li><li>• More proficient learners used a variety of VLS more frequently and elaborately.</li><li>• Results corroborated Sanaoui's (1995) findings that a structured approach (time and independence in this study) is important in vocabulary learning.</li></ul>
Gu (2002)	Over 800 EFL learners in China	<ul style="list-style-type: none"><li>• Questionnaire</li></ul>	<ul style="list-style-type: none"><li>• Effects of sex (gender) differences on VLS use</li><li>• Female learners used VLS more frequently than males.</li><li>• Academic majors had little influence on the use of VLS.</li></ul>

(Table 2.1 continues)

(Table 2.1 continued)

Study	Participants	Instruments	Findings
Nakamura (2002)	86 Japanese EFL learners in Japan and 92 Japanese EFL learners in England (high school students)	<ul style="list-style-type: none"><li>• Questionnaire</li><li>• Observation</li><li>• Interview</li></ul>	<ul style="list-style-type: none"><li>• Effects of learning environments (ESL/EFL) on VLS use</li><li>• Sex and year differences were observed in dictionary use, note-taking, and repetition strategies.</li><li>• Female learners used VLS more frequently than males.</li><li>• Effect of achievement level was found in word attacking (discovery) strategies.</li></ul>
Catalán (2003)	581 Basque and English as L2 learners in Spain	<ul style="list-style-type: none"><li>• Questionnaire</li></ul>	<ul style="list-style-type: none"><li>• Effects of sex differences on VLS use</li><li>• Female learners used VLS more frequently than males.</li></ul>
Fan (2003)	1,067 Hong Kong Chinese EFL learners	<ul style="list-style-type: none"><li>• Questionnaire</li><li>• Vocabulary size test</li></ul>	<ul style="list-style-type: none"><li>• VLS used most and least frequently</li><li>• Differences between the actual use and perceived usefulness of VLS</li><li>• VLS used by different proficiency levels of learners.</li><li>• The most proficient learners used sources, guessing, dictionary, and known words (activation) strategies more often than less proficient learners.</li><li>• Types of VLS especially relevant to learning high- and low- frequency words were dictionary and known words (activation) strategies.</li></ul>
Maeda, Tagashira, & Miura (2003)	1,177 Japanese EFL learners (high school students)	<ul style="list-style-type: none"><li>• Questionnaire</li><li>• Cloze test</li></ul>	<ul style="list-style-type: none"><li>• VLS used by different proficiency levels of learners</li><li>• Confirmed the Horino &amp; Ichikawa's VLS taxonomy (organization, imaging, and repetition)</li><li>• Proficient learners used VLS more frequently.</li></ul>

*Note.* For the differences of VLS use in males and females, the term “sex differences” is used in this table, instead of “gender differences,” to refer to only a biological category following Catalán (2003).

Several key concepts of VLS formulated from the findings of the previous studies (Table 2.1) can be summarized as follows:

1. *Learners use VLS in combination* (all the studies in Table 2.1): This idea also shows that use of VLS can be quantified; thus, studies using a questionnaire could be conducted to research the frequency of VLS use. In addition, this fact suggests that focusing on only a few VLS would not reveal a whole picture of actual VLS use by the learners.
2. *Successful (vocabulary) learners employ a wider variety of VLS in orchestrated/coordinated manners than their less successful counterparts do* (Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Lawson & Hogben, 1995): General language learning research (Grenfell & Macaro, 2007) and studies on other skills like listening (e.g., Vandergrift, 2003) have reached the same conclusion.
3. *Those who use a variety of VLS more frequently and consciously achieve higher levels of proficiency* (Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Horino & Ichikawa, 1997; Kojic-Sabo & Lightbown, 1999; Maeda, Tagashira, & Miura, 2003): Since learners choose VLS depending on their purposes, it has been pointed out that frequency alone cannot be an indication of skillful strategy use (Yamamori, Isoda, Hiromori, & Oxford, 2003). Still, previous research findings are generally in favor of the claim that the more frequently learners employ a variety of VLS, the higher levels of proficiency they can achieve. For instance, in Gu and Johnson's study (1996), 20% of the variance in either proficiency measures or vocabulary size could be explained with VLS use (in addition to beliefs about vocabulary learning).<sup>8</sup>



4. *Good learners take a “structured approach” to vocabulary learning* (Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Sanaoui, 1995): This is mainly based on Sanaoui’s (1995) work. In her study, Sanaoui (1995) found that what characterizes good learners is a structured approach that uses metacognitive aspects of VLS along with cognitive aspects of VLS (see Table 2.1). Kojic-Sabo and Lightbown (1999) supported this view by showing that study time and learner independence were the two factors most closely related to success in vocabulary learning and proficiency. Fan (2003), moreover, provided evidence that the most proficient learners in Hong Kong used sources for vocabulary learning, guessing from context, dictionary, and known words (activation) strategies rather than just relying on cognitive and memory strategies such as repetition and association. From these findings, metacognitive strategies can be considered more crucial than cognitive strategies in VLS. Successful vocabulary learners excel in metacognition and flexibility of strategy deployment (Macaro, 2006), and therefore they are viewed as taking a structured approach.

5. *Among cognitive and memory strategies, repetition strategies are more frequently used compared with imagery and association strategies* (Fan, 2003; Gu & Johnson, 1996; Lawson & Hogben, 1995; Schmitt, 1997): This is in agreement with the depth of processing theory since elaborate memory strategies require more mental effort. As such, Schmitt (1997) has suggested that shallower VLS may be more suitable for beginner level learners, while deeper VLS are good for intermediate or advanced learners.

6. *There is a gap between the range of VLS learners actually use and their perceived*

*usefulness* (Fan, 2003; Schmitt, 1997): Consistent discrepancy has been observed between the actual use and perceived usefulness of VLS in the literature. VLS that match in actual use and perceived usefulness are those learners already use and feel are beneficial (e.g., using a dictionary or repeatedly writing a word). On the contrary, differences are found in VLS which learners can see value, but they do not (or cannot) employ those VLS; for example, metacognitive strategies or memory strategies. This may be due to the fact that some learners are not quite up to the level where they can exercise higher levels of mental activities (i.e., memory or metacognitive strategies), or simply they may be not motivated enough to go further than using easier VLS such as repetition.

7. *Individual differences (e.g., motivation, age, and sex) and socio-cultural differences (e.g., learning environments and culture) have an influence on the choice and use of VLS* (Catalán, 2003; Gu, 2002; Horino & Ichikawa, 1997; Kojic-Sabo & Lightbown, 1999; Nakamura, 2002; Schmitt, 1997). Among all the variables possibly affecting the choice and use of VLS, motivation can be regarded as the most vital component (Cohen & Dörnyei, 2002). Surprisingly, very little VLS research has included motivation as part of the variables (the only exception is the study by Horino & Ichikawa, 1997 in Table 2.2). The other factors which have a definite effect on the choice and use of VLS are sex differences and learning environments. As for sex differences (Catalán, 2003; Gu, 2002; Nakamura, 2002), females almost always use VLS more frequently than males. Oxford, Nyikos, and Ehrman (1988) speculated that the difference in learning strategy use between sexes (genders) is derived from women's greater social orientation, their greater desire for social approval, and so on. Since the reason of this difference has yet to be fully explained scientifically, more research will be needed (Dörnyei, 2005). With regard to learning environments

(Kojic-Sabo & Lightbown, 1999; Nakamura, 2002), it has been reported that learners use different types of VLS because the amount of natural English input differs considerably in ESL and EFL environments. In general, learners tend to consciously review vocabulary in EFL settings, while learners in ESL settings rely on more natural sources such as daily conversations (Kojic-Sabo & Lightbown, 1999). These findings of the previous studies are congruent with general learning strategy research (Cohen & Macaro, 2007).

Taken together, all seven perspectives described above are indispensable in conducting VLS research. Indeed, a comprehensive view of VLS as a dynamic, integrated whole is always necessary in VLS research because, as Gu (2003b) states, “choice, use, and effectiveness of vocabulary learning strategies depend on the task, the learner, and the learning context” (p. 1).

### **2.2.5 Studies on VLS Instruction**

Since the onset of learning strategy research some three decades ago (see Cohen & Macaro, 2007, for a comprehensive review), the promise of intervention studies, i.e., teaching students learning strategies, has been widely recognized. Rubin (1975) emphasized that “(T)he inclusion of knowledge about the good language learner in our classroom instructional strategies will lessen the difference between the good learner and the poorer one” (p. 50). Furthermore, a recent review by Rubin, Chamot, Harris, and Anderson (2007) that teaching students learning strategies effectively increases not only their knowledge of strategies but also their motivation and performance. With these notions, a wealth of research on the effectiveness of learning strategies instruction has been conducted to date. Although some researchers such as Dörnyei (2005) point out that “the currently available evidence gives only moderate support, at best, for strategy training” (p. 177), the general

consensus in the field is that learning strategies instruction warrants time and effort both in and out of the classroom (Chamot, Barnhardt, El-Dinary, & Robbins, 1999; Cohen, 1998; Ikeda, 2007; Macaro, 2001; Oxford, 1990; among others). Given the high teachability of learning strategies, it is natural that practitioners would attempt to teach the strategies used by the more successful learners to the less successful ones, thereby facilitating or modifying their learning process.

Among the several types of learning strategies instruction, VLS instruction has attracted the attention of researchers around the world. This is because mastering vocabulary is one of the most challenging tasks that any learner faces while acquiring another language. Both teachers and learners have consistently found it necessary to compensate for the learners' limited vocabulary (Nyikos & Fan, 2007). Also, since there are too many words for teachers to instruct directly, teaching VLS will "allow learners to take control of learning away from the teacher" (Nation, 2001, p. 222). The importance of VLS instruction has been reflected in the fact that intervention studies have been conducted in addition to descriptive studies.

Intervention studies relating to VLS began focusing on memory strategies (commonly known as mnemonics) in the early 1980s (Cohen & Apeh, 1981; Meara, 1980), and a large portion of the past literature on VLS instruction have been composed during this time. Research on memory strategies instruction has been mostly propelled by the depth of processing theory ( Craik & Lockhart, 1972). Subsequently, similar studies have been carried out using more sophisticated methods (e.g., Atay & Ozbuigan, 2007). Although some researchers (e.g., Gu, 2003b) point out the limitations of mnemonics, the empirical findings suggest that memory strategies are effective for retaining vocabulary, especially when used in combination with other strategies as reviewed earlier (Brown & Perry, 1991).

While previous studies on memory strategies instruction have generally reported positive results, one study by O'Malley, Chamot, Stewner-Manzanares, Russo, and Küpper

(1985) presented inconsistent findings. They conducted a study in the classroom setting to investigate whether instruction on using a combination of various strategies, incorporating metacognitive, cognitive, and social/affective strategies, would result in improved learning with respect to speaking, listening, and vocabulary tasks. The result of the vocabulary test revealed that there were no differences among the treatment groups. However, when the participants were sorted according to ethnic groups, it was discovered that the Asian control group outperformed the Asian experimental group. This indicated that the Asian learners could not take advantage of the strategies that were taught, which in this case included self-evaluation for metacognitive strategies; imagery and grouping for cognitive strategies. They also concluded that the Asian learners preferred to use the learning strategy of rote repetition. This study indicated the possibility that cognitively demanding VLS, namely, imagery and grouping, do not necessarily work for all types of learners. It is, therefore, important in VLS instruction to consider individual differences in terms of, motivation level, gender, self-efficacy, career orientation, proficiency, and the learning environment (context) in which the learners are situated (Cohen & Dörnyei, 2002; Gu, 2003b; Oxford & Nyikos, 1989; Takeuchi, Griffiths, & Coyle, 2007).

Another important point in VLS instruction is the inclusion of metacognitive strategies. Rasekh and Ranjbar (2003) examined the effect of a ten-week metacognitive strategy training session conducted in a classroom setting with Iranian EFL students; they reported a positive effect on vocabulary learning. Zaki and Ellis (1999) also demonstrated that teaching metacognitive strategies in series of four 50-minute sessions brings about better vocabulary learning. It therefore appears that VLS instruction including metacognitive strategies would prove to be more beneficial than instruction without such strategies (Nyikos & Fan, 2007).

A review of VLS instruction studies reveals that in spite of the importance of investigating VLS in combination (see 2.2.4), the frequency of VLS instruction in

combination is extremely limited. Except for the study by O'Malley, Chamot, Stewner-Manzanares, Russo, and Küpper (1985), virtually no other study examines the effectiveness of teaching VLS in combination. The reason behind this research gap may be the lack of consensus as to a clear definition and taxonomy of VLS. In other words, the scope of what we mean by VLS is vague, and the term's ambiguity results in researchers focusing on only a few specific VLS in their studies.

Synthesizing the previous vocabulary acquisition and VLS research, Nyikos and Fan (2007) have suggested that "VLS instruction should be integrated throughout a course as a crucial pedagogical component in course materials which are sensitive to the learner's needs" (p. 273). VLS instruction and its effectiveness for different types of learners, therefore, should be researched in further detail to prove that it is a worthwhile undertaking.

### **2.2.6 Types of Data Collection Methods in VLS Studies**

In order to identify VLS learners employ, various data collection methods are utilized. As pointed out by several researchers (Chamot, 2005; Ozeki, 2000), self-reports (verbal reports) are more appropriate than observation for identifying language learning strategies used by learners, because the choice and use of language learning strategies involve a number of internal or mental processes which are not observable (Chamot, 2005; Cohen & Scott, 1996; Ozeki, 2000). This is why we need to obtain reports in the "learner voice" (Nyikos & Fan, 2007) by using self-reports such as questionnaires, interviews, think-aloud protocols, stimulated recalls, and learner's written records.

Among several types of self-reports, the most often used method in VLS research is a questionnaire (see Table 2.1). Questionnaires are considered to be relatively easy to construct and administer to a large number of participants (Dörnyei, 2003). Questionnaires thus are commonly used for investigating the current use of VLS and for examining the effects of intervention studies (i.e., administering before and after the intervention). It is

often pointed out that some problems of questionnaires as a measurement instrument (e.g., wording ambiguity; Gu, Wen, & Wu, 1995) pose a threat to reliability and validity. For example, several empirical studies of general language learning strategies have shown that the presence or absence of the learning task elicits different responses from the learners (Ikeda & Takeuchi, 2000; Oxford, Cho, Leung, & Kim, 2004; Qian, 2004). Based on these findings, Nyikos and Fan (2007) suggest that the validity would be improved if learners actually perform specific vocabulary learning tasks and then complete the questionnaire.

Given the limitations of questionnaires, many researchers (e.g., Dörnyei, 2007; Gu, 2003a; Takeuchi, 2003a) advocate for the mixed use of quantitative and qualitative research methods. Since what can be gleaned from a questionnaire study represents only a small fraction of a learner's true self, they suggest that qualitative research methods such as introspective interviews, stimulated recalls, think-aloud procedures, or written records inspection should be utilized to provide complementary evidence to the findings obtained from questionnaires.

Regarding interviews, Macaro (2001) states that they are “an attempt to get closer than questionnaires to what learners actually do” (p. 58). In retrospective interviews, for example, learners are prompted to recall the tasks they just completed. In this way, researchers can elicit responses otherwise obtainable from learners with questionnaires (Moir & Nation, 2002). More elaborate retrospective interviews can be conducted with stimulated recall (Gass & Mackey, 2000). In stimulated recall, learners are asked to report thought processes or strategies during a task by watching a videotape recording what the learners did while working on the task.

In addition to interviews, VLS research has owed its development to think-aloud protocols. Think-aloud protocols involve learners saying aloud what they are thinking as they are performing a task. The early VLS studies made use of this methodology (Ahmed 1989; Lawson & Hogben, 1995) and accumulated research findings in exploratory manners.

Furthermore, Gu (2003a) investigated two successful EFL learners in China by using think-aloud protocols and discussed the choice and use of VLS in detail. Since selection and deployment of VLS are very important aspects in successful vocabulary learning, think-aloud protocols can unveil such decision-making in employing VLS.

While the think-aloud protocol is apparently a useful data collection method, it can only target cognitive strategies used during a specific task. If we regard VLS as more than just cognitive processing during the time of a given task, another method to document other aspects of VLS (e.g., sources of new vocabulary, the number of reviews during a certain period of time, and other self-initiated activities) will be necessary. Considering the significant role played by metacognitive strategies in VLS (as described in the previous sections), written records of vocabulary learning entered by learners themselves (e.g., diary, learning log, vocabulary note-book, or portfolio) are useful and informative in tracing the true use of VLS. In Sanaoui's (1995) study, for example, daily written records of vocabulary learning kept by the participants contributed to the finding a "structured approach." Also, studies on note-taking have provided information on several metacognitive VLS such as the sources of vocabulary items recorded and the reasons behind word selection (McCrostie, 2007). This type of information would not be accessible with questionnaires, interviews, or think-aloud protocols. Hence, in order to accept the view that vocabulary learning is not a one-shot process but an ongoing undertaking, some forms of written records should be incorporated in the data collection method of VLS.

The data collection methods described above have both advantages and disadvantages (Cohen & Scott, 1996), and we cannot argue that one is better than the others. Each method therefore should be adopted, so that one can complement another according to the research purposes and the operationalized definition of VLS under investigation.

It should be mentioned here that another noteworthy issue related to data collection methods in VLS research is the use of standardized tests for measuring learners' proficiency.



In VLS studies, correlation between VLS and proficiency (success or achievement) is often examined to search for a possible causal representation. At present, however, “advanced” EFL learners may be referred to as “intermediate” learners in ESL settings. Therefore, a clear yardstick against a recognized set of criteria (i.e., standardized tests) should be used to measure learners’ proficiency regardless of learning environments.

### **2.3 Summary and Application to Study 1**

As reviewed in this chapter, there is ample evidence in the literature that learners use VLS for effective vocabulary learning and achieving higher proficiency. VLS instruction may lead to better vocabulary performance (Nyikos & Fan, 2007). From a pedagogical point of view, the effectiveness of VLS instruction should be examined with the Japanese EFL learners as well. Before conducting such VLS instruction, it was necessary to investigate the current VLS use by the target learners and make sure that research findings in the VLS literature are also applicable to Japanese EFL learners. Based on these grounds, Study 1 was first designed and carried out.

#### **Notes**

- 1 The terms, language “learning” strategies and language “learner” strategies, are used interchangeably in the literature. The term *learner strategies* is based on Cohen’s (1998) proposal to represent a broad definition of both language learning and language use strategies. In this dissertation, however, the term language “learning” strategies will be used consistently for clarity.
- 2 Cognates are words (L1) which have the same origin in L2. In the case of Japanese EFL learners, Japanese language is structurally so remote from English that checking for L1 cognates might not be useful. However, since a considerable amount of vocabulary in Japanese consists of loan words

(in Daulton's [1998] study of the 2,000 most frequent words of English, up to 38% are used as loan words in Japanese), learners can make use of their L1 vocabulary knowledge in guessing from context.

3 Conventionally, research on extensive reading (or graded reader) has assessed the learning outcomes by investigating vocabulary gains and retention. However, researchers (e.g., Pigada & Schmitt, 2006) have recently claimed effects of extensive reading should be assessed by how it contributes to developing and enriching already known vocabulary (i.e., vocabulary depth).

4 Nation (2001) argues "high-frequency words are so important that anything that teachers and learners can do to make sure they are learned is worth doing" (p. 16).

5 However, Oxford and Scarcella (2004) note that direct teaching of vocabulary is beneficial and necessary especially for most adult learners. This is because they cannot acquire large vocabulary from natural contexts.

6 Still, the act of writing could be useful for remembering vocabulary because "the motor theory of language" (Allott, 1991) suggests that bodily action is preceded by a mental picturing of the proposed action. Considering how imagery of the vocabulary helps vocabulary learning, there is a possibility that writing the target vocabulary (several times) facilitates the recalling it.

7 Contrary to the general belief that the keyword method is not helpful in terms of long-term retention, Beaton, Gruneberg, and Ellis (1995) reported that learners who had remembered vocabulary with the keyword method could recognize more than half of the words tested 10 years later.

8 Gu and Johnson (1996) note: "However, this is a substantial proportion given the number of related factors not investigated here" (p. 660).

## **Chapter 3: Study 1**

### **3.1 Purpose of Study 1**

In Study 1, a close replication of Gu and Johnson's study (1996) was conducted in order to grasp the VLS used by Japanese EFL university learners. Gu and Johnson's study was chosen as a model because it investigated the use of VLS extensively (91 vocabulary learning behaviors and 17 beliefs about vocabulary learning) with a large sample of Chinese EFL university learners. Thus, a comparison of results obtained from Japanese counterparts would be considered possible and informative. The research design, instruments, and analyses were therefore similar to those of the Gu and Johnson's study.

Comparison of the results between the previous studies and the current study in VLS use was the main purpose of Study 1. Especially, VLS use and its relationship with a proficiency measure and vocabulary size were of special interest. In addition, comparison of VLS use and perceived usefulness (if learners feel VLS asked are helpful/useful) was made following the previous findings by Fan (2003) and Schmitt (1997). Toward these goals, the present study examined the following three research questions:

1. What kind of VLS do average-proficiency Japanese EFL university students use?
2. Are there discrepancies between the frequency of VLS use and perceived usefulness?
3. What kind of VLS correlates with a proficiency measure and vocabulary size?

These research questions and their results were discussed, and compared where appropriate, in light of the past research findings in the area of VLS.

## **3.2 Method**

### **3.2.1 Participants**

Participants of Study 1 consisted of 139 female university EFL learners in a private university in western Japan. They all majored in humanities, and their ages ranged from 18 to 22. Thus, the effects of sex and academic major in the use of VLS (Catalán, 2003; Gu, 2002; Nakamura, 2002) were considered nonexistent.

### **3.2.2 Instruments**

*Vocabulary Learning Questionnaire Ver.3* (Gu & Johnson, 1996) was first translated into Japanese with the help of another researcher who has a Ph.D. in Education. The questionnaire is composed of two sections: Section one includes questions on beliefs about vocabulary learning (17 items), and section two addresses vocabulary learning strategies (91 items). After translation, the appropriateness of wording in Japanese was then checked by three researchers who hold a MA in TESOL. Since these processes involved translation and modification of the original questionnaire items, exploratory factor analysis for each category (see Table 3.1) was applied. SPSS 14.0 was used for both exploratory factor analysis and calculation of internal consistency. In exploratory factor analysis, maximum likelihood estimation with promax rotation was performed. In order to determine the number of factors, first by looking at the scree plot, a distinctive slope between any of the two factors and factors with the eigenvalues greater than 1.0 was checked. Then, items showing factor loadings above 0.4 on only one factor were adopted. As a result, 80 items out of original 108 items were left for further analyses (see Appendix A for each questionnaire item). Table 3.1 shows the dimensions and categories of the VLS questionnaire (Gu & Johnson, 1996), and the items finally used for the current study.

Table 3.1

*Dimensions and Categories of the VLS Questionnaire Used in Study 1*

Dimensions and Categories	No. of Items (No. in Questionnaire)	$\alpha$
<b>Beliefs about vocabulary learning</b>		
Words should be memorized	3 (A1-4)	.56
Words should be acquired in context: Bottom-up	2 (A5-6)	.61
Words should be studied and put to use: Top-down	5 (A7-11)	.69
<b>Metacognitive regulation</b>		
Selective attention	3 (B1-3)	.56
Self-initiation	4 (B4-7)	.60
Independence	3 (B8-10)	.69
<b>Guessing strategies</b>		
Using background knowledge/wider context	4 (C1-4)	.72
Using linguistic cues/immediate context	3 (C5-7)	.71
<b>Dictionary strategies</b>		
Dictionary strategies for comprehension	4 (D1-4)	.85
Extended dictionary strategies	3 (D5-7)	.81
Looking-up strategies	5 (D8-12)	.73
<b>Note-taking strategies</b>		
Meaning-oriented note-taking strategies	5 (E1-5)	.83
Usage-oriented note-taking strategies	4 (E6-9)	.78
<b>Rehearsal strategies</b>		
Using word lists	6 (F1-6)	.87
Oral repetition	2 (F7-8)	.60
Visual repetition	3 (F9-11)	.65
<b>Encoding strategies</b>		
Association/elaboration	5 (G1-5)	.86
Imagery	4 (G6-9)	.84
Using word-structure	3 (G10-12)	.83
Contextual encoding	3 (G13-15)	.78
<b>Activation strategies</b>		
	5 (H1-5)	.85

It should be noted that the subcategory “Independence” in Metacognitive regulation did not exist in Gu and Johnson (1996). This subcategory was created because they were divided as a result of exploratory factor analysis.<sup>1</sup> By the same token, the subcategories, “Visual encoding,” “Auditory encoding,” and “Semantic encoding” were not included in the analyses even though Gu and Johnson (1996) originally contained these subcategories.

As a proficiency measure, the TOEIC scores of the participants were used ( $n = 93$ ,  $M = 450.12$ ,  $SD = 106.23$ ). The number of learners with the TOEIC scores was fewer than the original number of participants because some of them had not taken TOEIC. The TOEIC consists of a listening section (100 items) and a reading section (100 items). The full score for each section is 495, making 990 the total possible score. According to Educational Testing Service (2006), the test's developer, "TOEIC has been used to measure the English proficiency of non-native English-speaking people." Thus, as an operational definition, the TOEIC total scores were used in this study to indicate the participants' English proficiency. The TOEIC Steering Committee (2006) reports the mean scores of TOEIC for university humanities majors are 474 and engineering 397. Therefore, it was assumed that the participants in this study were at the average level of Japanese EFL university learners.

In addition to the proficiency measure, Gu and Johnson's study (1996) used a vocabulary size test for measuring the learners' vocabulary size. Likewise, this study included a vocabulary size test (Mizumoto, 2005). This test consists of 240 multiple-choice items, and all of the participants in the current study took this test ( $n = 139$ ,  $M = 152.30$ ,  $SD = 28.18$ ). A sample of the vocabulary size test appears below:

Q: 推測する、～だと思う

- A. blame
- B. match
- C. guess
- D. load

The reliability coefficient was judged to be high enough to use it as a vocabulary size indicator ( $\alpha = .92$ ).

At the time of administering the questionnaire, learners were asked to respond to the

questionnaire with a 5-point Likert scale. Since the questionnaire had items on beliefs about vocabulary learning, and we also asked perceived usefulness for each VLS, three types of scale descriptors were used. Table 3.2 illustrates the three types of scale descriptors. Furthermore, the amount of time spent on vocabulary learning outside classroom (extracurricular study time) was also inquired. In addition to these surveys (which took about 20 minutes to complete), approximately 40 minutes were allotted for the participants to complete the vocabulary size test.

Table 3.2

*Scale Descriptors for the VLS Questionnaire*

Beliefs about vocabulary learning	Actual VLS use	Perceived usefulness
5. Absolutely agree	5. Very true of me	5. Very useful
4. Agree	4. True of me	4. Useful
3. Somewhat agree	3. Sometimes true of me	3. Sometimes useful
2. Disagree	2. Usually not true of me	2. Not so useful
1. Absolutely disagree	1. Not at all true of me	1. Not at all useful

### 3.2.3 Analysis Procedures

Descriptive statistics were examined for research questions 1 “What kind of VLS do average-proficiency Japanese EFL university students use?” and 2 “Are there discrepancies among the frequency of VLS use and perceived usefulness?” Also, comparison of the means between actual use and perceived usefulness was made using dependent *t*-test. The alpha for statistical decisions was set at .05 (the Bonferroni adjustment was applied where necessary). In addition to the statistical test, effect sizes were checked for the results. Correlation coefficients were examined for research question 3 “What kind of VLS correlates with a proficiency measure and vocabulary size?”

### 3.3 Results and Discussion

Table 3.3 shows the descriptive statistics of the questionnaire survey results. Before discussing research question 1: “What kind of VLS do average-proficiency Japanese EFL university students use?,” it should be reported that the beliefs about vocabulary learning indicate that participants in the current study in general felt words should be acquired in context ( $M = 4.29$ ,  $SD = 0.65$ ) and put to use ( $M = 4.09$ ,  $SD = 0.66$ ) rather than memorized as rote learning ( $M = 2.83$ ,  $SD = 0.64$ ). These results imply that Japanese EFL learners feel they understand the importance of learning vocabulary in context and actually using it. This is in line with the results of Gu and Johnson’s study (1996).

Overall, Guessing strategies (one of the categories “Using background knowledge/wider context”) and Dictionary strategies showed higher scores than other VLS, which correspond to the findings in the previous studies targeting Asian EFL learners (Fan, 2003; Gu and Johnson, 1996). In addition, two repetition (oral and visual) strategies were found to be used more frequently than encoding (memory) strategies. Therefore, the current study supports the tendency in VLS use found in the previous studies: Among cognitive and memory strategies, repetition strategies are used more frequently compared with imagery and association strategies (Fan, 2003; Gu & Johnson, 1996; Lawson & Hogben, 1995; Schmitt, 1997).

Among Rehearsal strategies, the category “Using word lists” showed a considerably lower score ( $M = 1.93$ ,  $SD = 0.98$ ) as did Gu and Johnson’s study (1996). This may be because items listed under this category involve factors other than simple rehearsal. For example, making lists or cards could be categorized as note-taking strategies, and reviewing them could be metacognitive strategies since it involves planning one’s learning.



Table 3.3

*Actual Use of VLS, Perceived Usefulness, and Their Differences*

Dimensions and Categories	1. USE		2. HELPFUL		Difference (2-1)	Effect size ( <i>r</i> )
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b>Beliefs about vocabulary learning</b>						
Words should be memorized	2.83	0.64				
Words should be acquired in context: Bottom-up	4.29	0.65				
Words should be studied and put to use: Top-down	4.09	0.66				
<b>Metacognitive regulation</b>						
Selective attention	2.91	0.78	3.97	0.66	1.06*	.77
Self-initiation	3.29	0.89	4.33	0.58	1.04*	.76
Independence	2.91	0.87	3.60	0.78	0.69*	.55
<b>Guessing strategies</b>						
Using background knowledge/wider context	3.55	0.81	4.12	0.61	0.57*	.58
Using linguistic cues/immediate context	2.91	0.98	3.97	0.67	1.06*	.75
<b>Dictionary strategies</b>						
Dictionary strategies for comprehension	4.41	0.80	4.49	0.58	0.08	.10
Extended dictionary strategies	3.43	0.97	4.52	0.53	1.09*	.75
Looking-up strategies	3.48	0.79	4.00	0.65	0.52*	.53
<b>Note-taking strategies</b>						
Meaning-oriented note-taking strategies	2.91	0.97	4.32	0.59	1.41*	.81
Usage-oriented note-taking strategies	2.60	0.91	4.29	0.60	1.69*	.85
<b>Rehearsal strategies</b>						
Using word lists	1.93	0.98	4.25	0.72	2.32*	.89
Oral repetition	3.04	1.09	3.74	0.80	0.70*	.55
Visual repetition	3.07	0.96	3.49	0.86	0.42*	.45
<b>Encoding strategies</b>						
Association/elaboration	2.37	0.92	3.81	0.71	1.44*	.83
Imagery	2.30	1.00	3.51	0.93	1.21*	.79
Using word-structure	2.25	0.99	3.68	0.86	1.43*	.80
Contextual encoding	2.87	0.97	4.31	0.71	1.44*	.83
<b>Activation strategies</b>	2.33	0.91	4.38	0.64	2.05*	.89

*Note.* HELPFUL stands for perceived usefulness; Range for the means (1-5); \*  $p < .05$  (Significant with the Bonferroni adjustment); Accepted criterion (Field, 2005) for the effect size ( $r$ ):  $r = .10$  (small effect),  $r = .30$  (medium effect),  $r = .50$  (large effect)

In fact, in his report on the results of Gu and Johnson's study (1996), Nation (1990) comments, "the data gained depends on the selection, classification, grouping and labelling of the various sub-strategies" (p. 226). Thus, items categorized in "Using word lists" could have been better categorized in other VLS in order to interpret the results found in the current study and those in Gu and Johnson's study.

As for research Question 2, which addressed: "Are there discrepancies among the frequency of VLS use and perceived usefulness?," the differences between actual use of VLS reported by the participants and perceived usefulness were examined with dependent *t*-test and effect sizes. The results in Table 3.3 indicate that they were significantly different ( $p < .05$  with the Bonferroni adjustment) with large effect sizes except in the category "Dictionary strategies for comprehension." These results support the previous VLS studies that observed a gap between VLS learners actually use and their perceived usefulness (Fan, 2003; Schmitt, 1997). It can be concluded that there are many VLS learners feel are useful, even though in reality they do not use them. This may be because learners use learning strategies depending on their perceived usefulness, cost, and preferences (Takeuchi, 2001). Also, there is a possibility that since some VLS may require higher proficiency level learners cannot use as taxing a VLS as the keyword method (e.g., Cohen & Aphek, 1980).

Table 3.4 summarizes the results of correlation analysis for investigating the research question 3: "What kind of VLS correlates with a proficiency measure and vocabulary size?" Another variable, extracurricular study time (Time), was included in the analysis in addition to the questionnaire following Gu and Johnson's study (1996). Small to moderate correlations<sup>2</sup> were found between VLS and TOEIC, the proficiency measure, and also between VLS and the vocabulary size test in Metacognitive regulation, Guessing strategies, Dictionary strategies, Activation strategies, and Time. Other than these VLS, only "Using word-structure" and "Contextual encoding" in Encoding strategies showed some degree of correlations.

Table 3.4

*Correlations with TOEIC and Vocabulary Size Test*

Dimensions and Categories	Study 1		cf. Gu & Johnson (1996)	
	TOEIC ( <i>n</i> = 93)	Vocabulary Size Test ( <i>n</i> = 139)	Proficiency	Vocabulary Size Test
<b>Beliefs about vocabulary learning</b>				
Words should be memorized	.01 (-.19 ~ .21)	-.14 (-.29 ~ .03)	—	
Words should be acquired in context:	.04	.07		
Bottom-up	(-.17 ~ .24)	(-.10 ~ .23)		
Words should be studied and put to use:	.03	.06		
Top-down	(-.17 ~ .23)	(-.10 ~ .22)		
<b>Metacognitive regulation</b>				
Selective attention	<b>.33**</b> (.14 ~ .50)	.13 (-.04 ~ .29)	+	+
Self-initiation	<b>.23*</b> (.03 ~ .41)	.11 (-.06 ~ .27)	+	+
Independence	.05 (-.16 ~ .25)	<b>.29**</b> (.13 ~ .44)	N/A	N/A
<b>Guessing strategies</b>				
Using background knowledge/wider context	.17 (-.03 ~ .36)	.18* (.01 ~ .34)	+	
Using linguistic cues/immediate context	<b>.20</b> (.00 ~ .39)	<b>.24**</b> (.08 ~ .39)	+	
<b>Dictionary strategies</b>				
Dictionary strategies for comprehension	.17 (-.03 ~ .36)	.08 (-.01 ~ .24)		
Extended dictionary strategies	<b>.38**</b> (.19 ~ .54)	<b>.22*</b> (.06 ~ .37)	+	+
Looking-up strategies	.05 (-.15 ~ .25)	.10 (-.07 ~ .26)	+	+
<b>Note-taking strategies</b>				
Meaning-oriented note-taking strategies	.05 (-.15 ~ .25)	.03 (-.14 ~ .20)		+
Usage-oriented note-taking strategies	.11 (-.10 ~ .31)	.14 (-.03 ~ .30)		
<b>Rehearsal strategies</b>				
Using word lists	.12 (-.19 ~ .21)	.10 (-.07 ~ .26)		
Oral repetition	.00 (-.20 ~ .20)	.09 (-.08 ~ .25)		
Visual repetition	-.02 (-.22 ~ .18)	-.11 (-.27 ~ .06)	—	—
<b>Encoding strategies</b>				
Association/elaboration	.04 (-.16 ~ .24)	.12 (-.05 ~ .28)		
Imagery	.12 (-.09 ~ .32)	.09 (-.08 ~ .25)		
Using word-structure	<b>.28**</b> (.08 ~ .46)	<b>.23**</b> (.07 ~ .38)		
Contextual encoding	.19 (-.01 ~ .38)	.15 (-.02 ~ .31)	+	+
<b>Activation strategies</b>				
	<b>.42**</b> (.24 ~ .57)	<b>.21*</b> (.05 ~ .36)		+
<b>Time</b>				
	<b>.28*</b> (.08 ~ .46)	.18* (.01 ~ .34)		

Note. \*  $p < .05$ , \*\*  $p < .01$ ; ( ) = 95% confidence intervals; values in bold ( $r > .20$ ); + ( $r > .20$ ), — ( $r > -.20$ ); N/A = Not applicable

Compared with Gu and Johnson's results (see Table 3.5), we can see similar tendencies in VLS use between Japanese and Chinese EFL university students. Since the number of participants differed considerably (current study,  $n = 139$ ; Gu & Johnson's study,  $n = 850$ ) and different instruments for the proficiency and vocabulary size measures were used, the results could be deemed almost the same if we consider 95% confidence intervals of correlation coefficients. Both the current study and Gu and Johnson's study showed that Visual repetition had negative or no correlations with the proficiency measure and the vocabulary size test. Taken together, as Gu and Johnson suggested, VLS that aim for only retaining words do not lead to the development of general English proficiency and vocabulary size, while other VLS (Metacognitive regulation, Guessing strategies, Dictionary strategies, Activation strategies, and Time in this study) may.

Differences between the current study and Gu and Johnson's study (1996) can be found in the category "Meaning-oriented note-taking strategies" and "Using word-structure." Compared to the participants in Gu and Johnson's study, participants in the current study might not be well versed in "Looking-up strategies" of dictionary strategies and "Meaning-oriented note-taking strategies." If we introduce these VLS to the learners like the ones who participated in the current study, therefore, it may be very beneficial to those learners, especially more proficient learners (since higher coefficients were found in the Gu & Johnson study).

On the other hand, the correlations for "Using word-structure" with TOEIC and the vocabulary size test in the current study were higher than those reported in Gu and Johnson's study. A possible explanation for this phenomenon may be the fact that Japanese EFL learners acquire some types of affixes substantially late (Mochizuki & Aizawa, 2000), and only more proficient learners can benefit from VLS using the knowledge of affixes and stems. Therefore, the results might reflect one characteristic of Japanese EFL learners.

### 3.4 Summary of Study 1

Study 1 examined the VLS used by Japanese female EFL university learners with average proficiency level. A close replication of Gu and Johnson's study (1996) made it possible to compare the results found in the current study and those in the past. Three research questions were addressed: (1) What kind of VLS do average-proficiency Japanese EFL university students use?; (2) Are there discrepancies among the frequency of VLS use and perceived usefulness?; and (3) What kind of VLS correlates with a proficiency measure and vocabulary size? While small differences were found, the results of the current study generally correspond to those reported in the past. Specifically, among cognitive and memory strategies, repetition strategies are more frequently used compared with imagery and association strategies (Fan, 2003; Gu & Johnson, 1996; Lawson & Hogben, 1995; Schmitt, 1997). Also, there is a gap between what VLS learners actually use and their perceived usefulness (Fan, 2003; Schmitt, 1997). Furthermore, VLS that aim for only retaining words do not lead to the development of general English proficiency and vocabulary size, while other VLS (Metacognitive regulation, Guessing strategies, Dictionary strategies, Activation strategies, and Time in this study) likely do.

The findings of the present study suggest that VLS instruction might be promising because there are discrepancies between VLS learners currently use and what they perceive useful. As Schmitt (1997) suggests, "learners may be willing to try new strategies if they are introduced to and instructed in them" (p. 221).

While Study 1 has provided us with valuable information on the VLS used by average-proficiency Japanese EFL learners, some limitations should be pointed out. First, correlations obtained in a quantitative study cannot identify cause and effect. Close investigation of the findings through qualitative research may be useful to unveil the complex structure of the relationship between VLS use and learning outcomes. Second, the questionnaire used in the current study and its construct have to be thoroughly inspected. As

stated earlier, the results of this type of questionnaire study depend on the selection, classification, and labeling of the items (Nation, 2001). The original questionnaire by Gu and Johnson (1996) had a category with reliability coefficients (Chronbach's alpha) as low as .50 even though they had a large number of participants ( $N = 850$ ). In addition, Gu and Johnson's questionnaire included several constructs which may not be truly "strategic" vocabulary learning. For example, motivated or unmotivated, learners would use a dictionary for reading comprehension and we are not sure if the behavior is "strategic"<sup>3</sup> or not. For these reasons, a psychometrically valid instrument for measuring strategic vocabulary learning should be developed, and reliability and validity of the instrument must be verified before we take on any type of VLS instruction.

## Notes

- 1 Another possibility is the effect of including reversed value items in the questionnaire. Those items categorized in "Independence" were given reversed value. As Tanaka and Maeda (2004) showed, reversed value items will be likely to come together in one factor in factor analysis.
- 2 Dörnyei (2001) claims that "(i)n L2 motivation studies, the usual strength of the meaningful relationships detected is between 0.30 and 0.50" (p. 224); therefore, in this type of study which uses questionnaires, the correlation coefficients close to these figures can be considered worthy of some reflection.
- 3 The word "strategic" here implies that the behavior is intentional and therefore can be distinguished from ordinary learning behavior (Dörnyei, 2005) without any intention to improve one's learning outcomes.

## Chapter 4: Study 2

### 4.1 Background

Assessment of learning strategies learners employ has been commonly conducted with Likert scale questionnaires (Likert, 1932). A Likert scale questionnaire, which is designed as “a psychometrical scale,” will measure the same construct with more than two items (called multi-item scales, Dörnyei, 2003, p. 32). A reliability coefficient for each subscale and the score of each subscale is calculated by summing the items (or averaging them). These procedures are so straightforward that it has made the Likert-scale questionnaire the assessment instrument of choice for researchers around the world.

In language learning strategy literature, the most often used questionnaire has been *Strategy Inventory for Language Learning* (SILL; Oxford, 1990). SILL (the EFL/ESL version) consists of 50 items measuring six subscales (Memory strategies, Cognitive strategies, Compensation strategies, Metacognitive strategies, Affective strategies, and Social strategies). By averaging the scores for each subscale, the learner’s profile of learning strategy can be obtained. Although SILL has been used all over the world (reportedly with over 10,000 students in the middle of the 1990’s; Grenfell & Macaro, 2007), the validity of SILL has come under criticism. For example, Dörnyei and his colleagues (Dörnyei, 2005; Tseng, Dörnyei, & Schmitt, 2006) have argued that using a questionnaire asking “specific strategic behaviors and the scale descriptors indicating frequencies of strategy use” is not psychometrically justifiable. They argue that this is because “we cannot assume a linear relationship between the individual item scores and the total scale scores” (Tseng et al., 2006, p. 83). They thus took SILL as an example of a “flawed” assessment instrument of learning strategy. In addition, a study investigating construct validity of SILL with confirmatory factor analysis by Hsiao and Oxford (2002) showed an unsatisfactory model fit to the data, indicating the hypothesized model of SILL

does not possess construct validity.

Tseng, Dörnyei, and Schmitt (2006) claim that “(t)he same problems also hold true in the more specific area of vocabulary learning strategies (VLS)” (p. 84). Referring to the studies by Schmitt (1997), Gu and Johnson (1996), and Stoffer (1995), they argue taxonomies and subscales used in these studies still have similar validity problems as SILL. In fact, they believe, it is the most important concern of these questionnaires—none of these earlier instruments had been subjected to rigid validation procedures.

In Japan, Horino and Ichikawa (1997) compiled a questionnaire of VLS used by Japanese high school students. With factor analysis, they distinguished organization, imaging, and repetition strategies, and since then several studies have been conducted utilizing this questionnaire, and its validity has been established (Maeda, Tagashira, & Miura, 2003). This questionnaire, however, only covers the cognitive aspect of VLS, and metacognitive strategies, which involve planning, monitoring, and evaluation of one’s learning (O’Malley & Chamot, 1990), are not included. Considering the importance of metacognitive strategies in vocabulary learning (as reviewed in Rasekh & Ranjbary, 2003), we are still in need of a questionnaire covering metacognitive strategies as well.

It is true that “the area of VLS is still in need of an instrument which is truly psychometrically valid” (Tseng et al., 2006, p. 85). We therefore developed and validated a scale of strategic vocabulary learning, which possesses psychometrically sound construct in Study 2.

## **4.2 Purpose of Study 2**

In Study 2, a psychometrically valid questionnaire (scale) on strategic vocabulary learning was developed for Japanese EFL learners, university students in particular. There were three phases involved in developing and validating the scale. First, items were pooled from the relevant literature on vocabulary learning strategies and ideas from target learners.



Second, an initial field test was conducted with 410 university learners. Subsequent item analyses retained 25 items. Third, the reliability and validity of the final version of the instrument were examined thoroughly with a different sample of learners ( $N = 283$ ). In addition, validity of the new instrument was further examined in relation to the TOEIC scores and (a) the subscales and (b) the overall strategic vocabulary learning capacity.

### **4.3 Method**

#### **4.3.1 Development of the Item Pool: First Phase**

A list of strategic vocabulary learning behaviors was developed following the procedures detailed below. Following the guidelines suggested by Dörnyei (2003), first, an inventory of VLS was compiled from a literature review (especially, Fan, 2003; Gu & Johnson, 1996; Horino & Ichikawa, 1997; Schmitt, 1997). Next, in order to gather qualitative and exploratory data from the target informants, a total of 122 Japanese EFL university students at a private university in western Japan (humanities majors, all females, and aged 18-21) were asked in an open-ended manner to list the strategies they use. At the time of the survey, an inventory listing VLS extracted from the literature review was also provided as a reference. This is because students sometimes feel difficulty in describing the strategies they use because they might use them without much awareness. At the same time, a specific vocabulary learning task was given since it is reported that learners respond in different ways depending on whether or not the task is clearly presented (Ikeda & Takeuchi, 2000; Oxford, Cho, Leung, & Kim, 2004). The vocabulary learning task was to learn vocabulary both in context and a word list. The participants were asked what kind of strategies they use in order to memorize the words provided in the task within one week (until the next lesson). A simple background survey confirmed that (a) none of the students had experience studying abroad more than 10 months, and (b) they started studying English in junior high school in the same way as ordinary Japanese EFL learners did.

After revising the item pool by adding strategies reported by the learners, wording of the items was examined and modified where necessary by two university associate professors and a high school teacher, all of whom have an MA in TESOL. According to Dörnyei (2005, p. 164), the most fundamental problem in the learning strategy literature is its inability to distinguish “ordinary learning activity” and “strategic learning activity.” Thus, we defined strategic vocabulary learning in this study as follows:

Learners’ *intentional* vocabulary learning behaviors while they are in the process of memorizing new vocabulary (cognitive strategies) and coordinating their strategic behaviors (metacognitive strategies).

Following this definition, among the 89 strategies listed altogether, 47 strategies pertaining to either cognitive or metacognitive strategies defined by Dörnyei (2005, p. 169) were consequently chosen through the cooperation of the three EFL instructors. It should be noted that social strategies and affective strategies were rarely reported by the informants; therefore, they were excluded from the list. In addition, strategies included in previous studies (e.g., Ahmed, 1989; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999) such as inference from context, dictionary use, and note-taking strategies were not included. Whereas we believe these strategies are important for vocabulary learning, including different constructs in one questionnaire would result in too many constructs and items to be measured at one time. That, in turn, may produce a “fatigue effect” (Dörnyei, 2003, p. 14) on the side of respondents. Moreover, those without intentions to learn vocabulary are also likely to infer from context, use dictionaries to look up vocabulary, and take notes without much awareness toward learning. For example, Folse (2004) gives concrete examples that guessing from context does not necessarily guarantee learning in terms of vocabulary acquisition. Thus, we excluded these strategies, which have some elements of

“unintentional” or “ordinary” learning behaviors.

#### **4.3.2 Piloting the Instrument: Second Phase**

The new vocabulary questionnaire with 47 items was field tested with 410 university EFL learners at four universities in western Japan. The participants at these four institutions majored in humanities and engineering (137 males and 273 females, aged 18-22). Although in the pilot study proficiency measures were not available for the learners, the authors confirmed, based on observations and in-house examinations, that these participants seemed to have about the same proficiency level as the pilot sample. In the survey, the participants were given a vocabulary learning task immediately before filling out the questionnaire. On a 5-point scale—with 1 indicating 0%, or not at all true of me, and 5 being 100%, or very true of me—they were asked to indicate how they usually deal with vocabulary learning.

The participants’ English proficiency was investigated via a background questionnaire that asked for their TOEIC scores only from those who had taken TOEIC before ( $n = 384$ ,  $M = 373.72$ ,  $SD = 102.69$ ). The TOEIC Steering Committee (2006) reports the mean scores of TOEIC for university humanities majors are 474 and engineering 397. Therefore, it was assumed that the participants in this study were at the false-beginner/average level of Japanese EFL university learners.

After the administration of the questionnaire, item analyses were carried out based on the following criteria: (a) checking the descriptive statistics to eliminate items with a floor or ceiling effect (the mean  $\pm$  the standard deviation); (b) examining the item-total correlations to determine whether the figures were over 0.3 (Wintergerst, DeCapua, & Itzen, 2001, p. 391); (c) using exploratory factor analysis to investigate which items belong together (i.e., construct validity); (d) scrutinizing Cronbach’s alphas to verify the internal consistency of the subscales; and (e) employing Rasch analysis to see if all the items in the developed scale measure a single underlying construct, which is “strategic vocabulary

learning” in the current study.

SPSS 14.0 was used for both exploratory factor analysis and calculation of the internal consistency. In exploratory factor analysis, principal axis factoring extraction with promax rotation was performed. As for deciding the number of factors, first by looking at the scree plot, a distinctive slope between any of the two factors and factors with the eigenvalues greater than 1.0 was checked. Then, items showing factor loadings above 0.4 on only one factor were adopted.

The advantage of utilizing the Rasch model is that it presupposes the instrument’s unidimensionality along a latent trait. This means that if some items in the questionnaire are tapping a different construct from the other items, or responses of some learners are inconsistent for some reason (e.g., respond haphazardly, misinterpret the wording, or skip some items), they can be detected. Those items detected are called misfit items, which show a departure from the meaningful psychometrical property of the construct. Based on these theoretical grounds, the obtained data were analyzed with the Rasch Rating Scale model (Andrich, 1978) using WINSTEPS 3.63.0 (Linacre & Wright, 2000). Furthermore, the Rasch model can place each item according to its difficulty in a single measure scale by changing ordinal scales (i.e., raw scores in a questionnaire) into interval scales. That is, with interval scales, we can confirm that a certain item in a questionnaire is more difficult than others (and how much more) for the respondents to endorse.

After going through these screening processes, strategies Japanese EFL learners rarely employ, such as “I draw a picture to remember the word,” and “I use a gesture to remember the word,” were deleted from the questionnaire. Also, reportedly overused strategies such as visual repetition did not make the list. This is because strategies many learners use too often may no longer constitute “strategic learning” and thus they do not reflect the element of choice (Cohen, 1998). These analysis procedures resulted in the final version of the questionnaire having 25 items (see Appendix C to refer to each item).

### 4.3.3 Administering the Final Instrument: Third Phase

In order to further investigate the reliability and validity of the newly developed instrument, the 25-item questionnaire was once again administered to a new group of 283 Japanese EFL students (126 males and 157 females, humanities and engineering majors, aged 18-22) at two private universities. In checking the biographical data of the participants, the same criteria in the first and second phases of the questionnaire development were applied. The participants' proficiency levels—measured by reported TOEIC scores ( $N = 283$ ,  $M = 364.15$ ,  $SD = 97.99$ )—were confirmed as being close to those of the learners in the second phase.

Cronbach Alpha coefficients of six subscales in the final version of VLS questionnaire were computed in the same way as the second phase. In order to explore the construct validity of the final instrument, the questionnaire was submitted to confirmatory factor analysis (CFA). With confirmatory factor analysis, we can test the hypothesized factor structure obtained in exploratory factor analysis. In other words, one of the biggest advantages of confirmatory factor analysis, according to Hair, Black, Babin, Anderson, and Tatham (2006), is “its ability to assess the construct validity of a proposed measurement theory” (p. 776). As such, confirmatory factor analysis is often used in validation of a research instrument. In confirmatory factor analysis, we tested the two models: (a) a six-factor model consisting of interrelated factors (First-order CFA model) and (b) first-order factors explained by a single overarching factor of “strategic vocabulary learning” (Second-order CFA model). The differences of these two models are described in detail in Byrne (2001).

Bachman and Palmer (1996) argue that “construct validation is an on-going process.” As part of validation process, correlations with TOEIC scores were examined because previous research on VLS has reported that there is a relationship between the use of VLS

and proficiency measured by paper-and-pencil tests (e.g., Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Maeda et al., 2003). The current study also investigated their relationship with simple correlation analysis looking into correlations between VLS and proficiency measures, namely TOEIC scores.

In addition, the effect of VLS as a whole on proficiency measures was examined using structural equation modeling (SEM). The rationale behind this particular analysis is that in language learning strategies, it is often reported that using not only one strategy but also several strategies in an orchestrated fashion is important (e.g., Oxford, 1990; Vandergrift, 2003). If the coordinated use of strategies is of our interest, we will have to look into how the overall latent trait, strategic vocabulary learning, contributes to proficiency, and not a one-to-one simple correlation. In such an analysis, structural equation modeling can be a powerful tool because it can deal with latent variables in the model. Structural equation modeling including confirmatory factor analysis was conducted using Amos 5.0.

## **4.4 Results and Discussion**

### **4.4.1 Item Analyses of the Instrument: Second Phase**

Table 4.1 summarizes the results of exploratory factor analysis, factor names, and the Cronbach Alpha coefficients for the final set of items (the descriptive statistics of each item is listed in Table 4.3). Overall, six distinct factors accounting for 61.37% of the variance explained were gleaned from exploratory factor analysis, and their underlying factor structure was supported by moderately high reliability coefficients. Each factor was named after empirical research findings proven in the literature of VLS, especially referring to those by Fan (2003), Gu and Johnson (1996), Horino and Ichikawa (1997), and Schmitt (1997). The comparison of the subscales in the current study with those of past research is summarized in Table 4.2. The comparison table shows that the new instrument covers the

constructs of interest it was intended to measure. By computing the mean score of each item, scale scores were formulated.

Next, by making use of the advantages of the Rasch model (i.e., detecting unidimensionality in the mixed constructs), the existence of misfit items was checked. The absence of such items is proof that the instrument possesses a meaningful psychometrical property. Presented in Table 4.3 are the results of the Rasch analysis ( $N = 410$ ). According to McNamara (1996, p. 173), a conventional rule of thumb for checking acceptable items is the infit mean square ranging from 0.75 to 1.3. He also notes that “(M)ore accurately, for  $n$  sizes of 30 or more, the range is the mean  $\pm$  twice the standard deviation of the mean square statistics” (p. 181). Based on this criterion, acceptable infit mean square for the sample of learners in this study was calculated (0.65-1.38). As figures of the infit mean square in Table 4.3 indicate, no item in the VLS questionnaire was a misfit, and the obtained data conformed to the Rasch model.

The main principle of the Rasch model is that “each item and person is located along the logit scale according to its estimated value: More positive (higher) persons are more able, and more positive (higher) items are more difficult” (Bond & Fox, 2001, p. 34). As such, with Rasch analysis, it is possible to diagnose that a learner with the person estimate of -0.5 in Table 4.3 is highly unlikely to choose “very true of me” in item 5 (Self-management) in the questionnaire because their strategic vocabulary learning ability is lower than the item difficulty estimate (0.79). In this way, Rasch analysis can give some feedback on the learners’ current ability to use specific vocabulary learning strategies and on the types of strategies they have not mastered yet.

Table 4.1

*Results of Exploratory Factor Analysis (N = 410)*

Item	Factor name	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	$\alpha$	
Item 1		.72	-.07	.05	.00	-.04	.04	.83	
Item 2		.70	-.26	.01	-.05	.08	.02		
Item 3	Factor 1	.69	-.05	.05	-.03	.00	-.03		
Item 4	Self-management	.64	.19	-.06	.02	-.01	.02		
Item 5		.57	.13	-.01	-.01	.00	.01		
Item 6		.55	.32	-.10	.02	-.05	-.05		
Item 7		.54	.03	.08	.11	.03	-.03		
Item 8		.03	.81	-.07	.02	.03	.00	.82	
Item 9	Factor 2	-.02	.79	.02	-.08	.02	-.02		
Item 10	Input-seeking	-.11	.69	.06	.04	.00	.02		
Item 11		.05	.62	.07	-.02	.02	.00		
Item 12		-.06	.01	.80	-.02	.01	-.08	.73	
Item 13	Factor 3	.04	.11	.61	-.02	-.08	.00		
Item 14	Imagery	.03	-.03	.57	.09	.09	-.04		
Item 15		.15	-.15	.49	-.08	.03	.06		
Item 16		-.05	.16	.45	.03	-.06	.12		
Item 17	Factor 4	-.01	-.04	-.01	.86	.04	-.05	.78	
Item 18	Writing Rehearsal	.02	-.01	-.01	.75	-.06	.00		
Item 19		-.01	.01	.02	.63	.00	.09		
Item 20	Factor 5	.02	-.04	.01	.03	.92	-.07	.79	
Item 21	Oral Rehearsal	-.07	.17	.03	.00	.66	.02		
Item 22		.08	-.01	-.04	-.06	.62	.10		
Item 23	Factor 6	-.04	-.02	-.06	.02	.04	.83	.79	
Item 24	Association	-.03	.06	.01	-.01	.03	.77		
Item 25		.12	-.05	.07	.01	-.06	.61		
	Interfactor correlation matrix	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	<i>M</i>	<i>SD</i>
	1. Self-management	—						2.37	0.82
	2. Input-seeking	.48	—					2.51	1.01
	3. Imagery	.32	.30	—				2.81	0.84
	4. Writing Rehearsal	.24	.17	.11	—			3.84	0.96
	5. Oral Rehearsal	.31	.38	.29	.21	—		2.88	1.06
	6. Association	.51	.36	.33	.16	.23	—	2.56	0.87



Table 4.2

*Comparison of the Subscales/categories of the New Questionnaire with Those of Previous Studies*

Subscale/category of this study	Gu & Johnson (1996)	Schmitt (1997)	Horino & Ichikawa (1997)	Fan (2003)
Self-management	•Metacognitive Regulation: Self-initiation	•Metacognitive	N/A	•Management
Input-seeking	•Activation	•Metacognitive	N/A	•Sources
Imagery	•Memory: Encoding	•Memory	•Imagery	•Association
Association	•Memory: Encoding	•Memory	•Organization	•Association •Grouping
Writing Rehearsal	•Memory: Rehearsal	•Cognitive	•Repetition	•Repetition
Oral Rehearsal	•Memory: Rehearsal	•Cognitive	•Repetition	•Repetition
N/A	•Beliefs •Metacognitive Regulation: Selective attention •Guessing •Dictionary •Note-taking	•Determination •Social	N/A	•Guessing •Dictionary •Analysis •Known Words

*Note.* N/A indicates that the subscale/category is not applicable.

In Table 4.3, metacognitive strategies (Self-management and Input-seeking) tend to have a higher item difficulty estimate than cognitive strategies (Imagery, Association, Oral Rehearsal, and Writing Rehearsal). As the literature of the learning strategies emphasizes, the result proves that “metacognitive strategies are higher order executive skills” (O’Malley & Chamot, 1990, p. 44), and they require much more effort on the learners’ side.

In examining the item difficulty estimate, it has become clear that even within the same subscale, the item difficulties among all items are different from one another. For example, items in the subscale of Input-seeking relatively rank higher in Table 4.3; however, Item 10 ranks much lower than other Input-seeking items. This means that Item 10, “I try to make use of the media (TV, radio, Internet, mobile phone, or movies) to learn vocabulary,” is much

easier to endorse. In contrast, in the Imagery subscale, Item 13 “When I try to remember vocabulary, I link my personal experiences to it” is much harder than other Imagery items for the respondents to use.

Table 4.3

*Results of Rasch Analysis in the Order of Difficulty Estimate (N = 410)*

Item No.	Category	Difficulty Estimate (in logits)	Infit Mean Square	<i>M</i>	<i>SD</i>
Item 5	Self-management	0.79	0.80	1.96	0.96
Item 3	Self-management	0.56	1.25	2.16	1.19
Item 2	Self-management	0.48	1.17	2.23	1.24
Item 11	Input-seeking	0.41	0.92	2.30	1.14
Item 8	Input-seeking	0.33	0.96	2.37	1.22
Item 13	Imagery	0.33	1.14	2.38	1.21
Item 9	Input-seeking	0.32	1.17	2.38	1.29
Item 1	Self-management	0.28	0.83	2.43	1.13
Item 22	Oral Rehearsal	0.26	1.07	2.45	1.20
Item 24	Association	0.25	0.66	2.46	0.99
Item 6	Self-management	0.20	0.86	2.51	1.16
Item 25	Association	0.20	0.79	2.51	1.04
Item 4	Self-management	0.18	0.74	2.53	1.14
Item 23	Association	0.01	0.77	2.71	1.06
Item 15	Imagery	0.00	1.17	2.73	1.22
Item 7	Self-management	-0.04	0.93	2.77	1.25
Item 16	Imagery	-0.04	1.14	2.77	1.28
Item 21	Oral Rehearsal	-0.18	1.11	2.93	1.31
Item 10	Input-seeking	-0.23	1.17	2.99	1.35
Item 14	Imagery	-0.28	0.97	3.05	1.17
Item 12	Imagery	-0.34	0.96	3.11	1.14
Item 20	Oral Rehearsal	-0.47	1.05	3.27	1.26
Item 18	Writing Rehearsal	-0.92	1.30	3.75	1.21
Item 17	Writing Rehearsal	-1.03	1.31	3.86	1.19
Item 19	Writing Rehearsal	-1.09	1.04	3.92	1.05

*Note.* Refer to Appendix C for each item.

## 4.4.2 Validity of the Instrument: Third Phase

### 4.4.2.1 Confirmatory Factor Analysis (CFA)

Table 4.4 presents the Cronbach Alpha coefficients of the six subscales administered to another sample of 283 students in the third phase. The internal consistency reliability of the six subscales was satisfactorily high.

Table 4.4

*Descriptive Statistics of the Final Administration (N = 283)*

Subscale	No. of Items	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	$\alpha$
Self-management	7	2.36	0.81	0.38	-0.40	.84
Input-seeking	4	2.54	1.01	0.38	-0.59	.83
Imagery	5	2.87	0.87	0.23	-0.39	.78
Writing Rehearsal	3	3.79	0.95	-0.42	-0.61	.79
Oral Rehearsal	3	2.87	0.99	-0.26	-0.67	.78
Association	3	2.61	0.88	0.37	-0.14	.84

Figure 4.1 shows the results of two hypothesized models tested in confirmatory factor analysis, and Table 4.5 lists goodness-of-fit statistics for them. It is suggested that several goodness-of-fit statistics be reported to assess the adequacy of model fit (Byrne, 2001). We therefore have reported several standard indexes and their respective acceptable fit criteria in Table 4.5. The first-order CFA (a six-factor model consisting of interrelated factors) and second-order CFA (first-order factors explained by a single overarching factor of “strategic

vocabulary learning”) showed good fit indexes, indicating that the hypothesized model can be reproduced with new observed data and be judged as valid.

As can be seen in the second-order CFA in Figure 4.1, however, the factor loading from the higher factor “strategic vocabulary learning” to Writing Rehearsal is unexpectedly low (.28). This means that using writing rehearsal strategies is not strongly related to strategic vocabulary learning. For example, those learners with less ability to employ strategic vocabulary learning use writing rehearsal more often than those with more strategic ability do. As a result, it is not reflected in the overall strategic vocabulary learning. At the same time, since all path coefficients are significant ( $p < .001$ ), there is a possibility that even those with higher strategic vocabulary learning competence may use writing rehearsal in the same way as less competent ones do. Therefore, we deleted Writing Rehearsal from the second-order CFA model and reanalyzed it. The result in Table 4.5 suggests that it yields better fit to the data because lower AIC indicates a better model among several competing models. Nevertheless, other goodness-of-fit statistics did not show much improvement. In addition, this type of trial-and-error approach to finding a model with a better fit is known as “specification search,” and it is not recommended (Hair, et al., 2006, p. 797). Accordingly, we decided to retain Writing Rehearsal in the model.

Overall, these confirmatory factor analyses suggest that the scale formed by 25 items in the questionnaire does provide a reasonable basis for measurement of a latent trait, namely, “strategic vocabulary learning.”

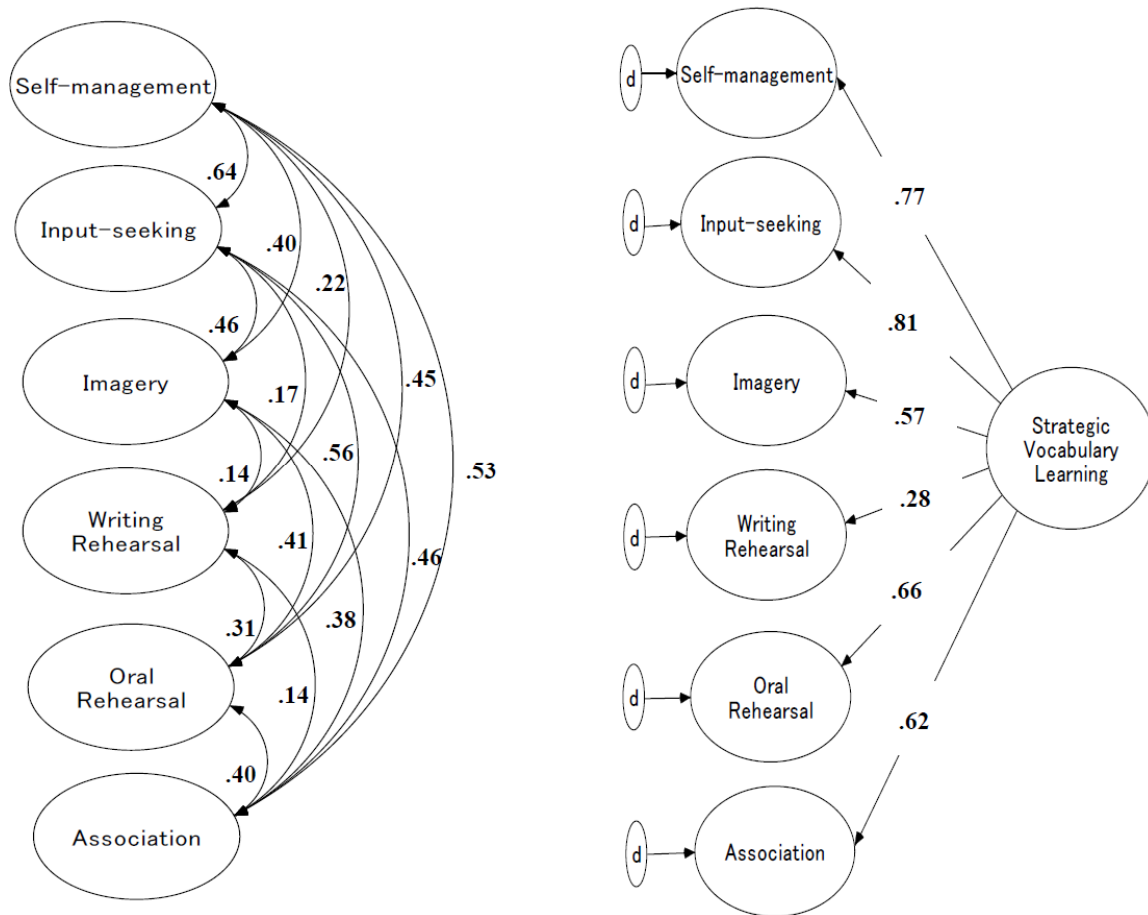


Figure 4.1. First- and second-order confirmatory factor analysis.

Observed variables are not shown for simplicity.

Table 4.5

Goodness-of-fit Statistics for the First- and Second-order CFA

	$\chi^2/df$	GFI	AGFI	CFI	TLI	IFI	NFI	RMSEA	AIC
acceptable fit	< 3	>.9	>.9	>.9	>.9	>.9	>.9	<.08	—
First-order model	1.76	.89	.86	.93	.92	.93	.85	.05	587.55
Second-order model 1	1.76	.88	.86	.93	.92	.93	.84	.05	584.76
Second-order model 2 (without Writing Rehearsal)	1.81	.90	.87	.93	.92	.93	.86	.05	467.14

Note. GFI = Goodness of fit index, AGFI = Adjusted goodness of fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, IFI = Incremental fit index, NFI = Normed fit index, RMSEA = Root mean square error of approximation, AIC = Akaike information criterion

#### 4.4.2.2 Relationship with the Proficiency Measure

Table 4.6 shows the results of zero-order correlations among subscales in the VLS questionnaire and the total score of TOEIC. Relatively low but statistically significant correlations were observed in the combination of VLS and scores of proficiency measures ( $N = 283$ ). Dörnyei (2001) claims that “in L2 motivation studies, the usual strength of the meaningful relationships detected is between 0.30 and 0.50” (p. 224); therefore, in this type of study which utilizes questionnaires, the correlation coefficients close to these figures can be considered worth paying attention to.

What is clear from Table 4.6 is that only Input-seeking shows a reasonably high correlation coefficient ( $r = .39$ ), while the other strategies demonstrate low correlation coefficients. Items included in the Input-seeking strategies (e.g., “I try to read and listen to English as much as possible in order to expose myself to English vocabulary”) seem more or less related to overall language proficiency, which can explain why they are more correlated with general proficiency measures. Other VLS subscales, Self-management, Oral Rehearsal, and Association, exhibited relatively low correlations, and Writing Rehearsal was uncorrelated. These results correspond to previous studies. For example, investigating vocabulary learning strategies and a proficiency measure (CET Band 2), Gu and Johnson (1996) reported the same patterns as the current study did. Also, Pintrich, Smith, Garcia, and McKeachie (1993), using the Motivated Strategies for Learning Questionnaire (MSLQ), found that in general learning strategy scales, Metacognitive Self-Regulation showed the highest correlation ( $r = .30$ ) with the final course grade, and lower figures with other strategies: Rehearsal ( $r = .05$ ), Elaboration ( $r = .22$ ), and Organization ( $r = .17$ ). Since the correlations obtained in the current study are in the expected directions and consistent with these studies, the strategic vocabulary learning scale consisting of six subscales can be judged as a valid measure for assessing strategic vocabulary learning behaviors.

Table 4.6

Correlations with TOEIC (N = 283)

Subscale	<i>r</i> with TOEIC
Self-management	.18**
Input-seeking	.39**
Imagery	.11
Writing Rehearsal	-.04
Oral Rehearsal	.17**
Association	.13*

\**p* < .05, \*\**p* < .01

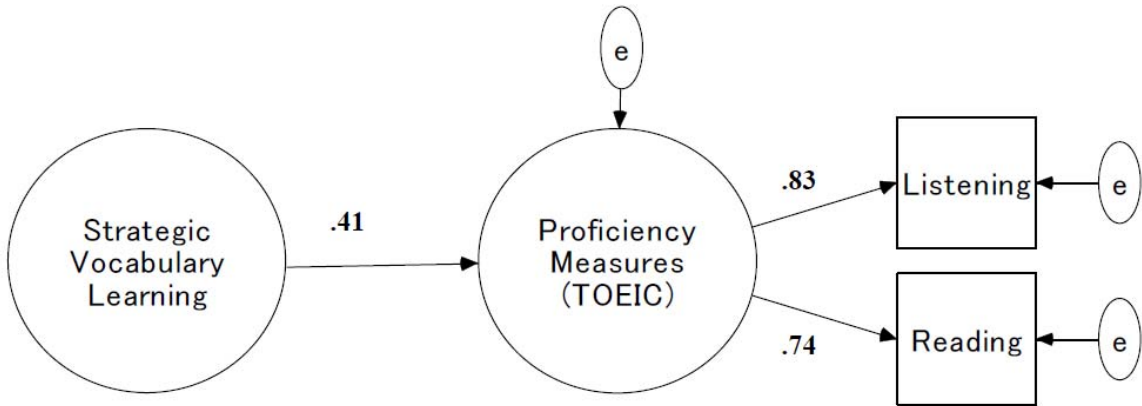


Figure 4.2. Effect of strategic vocabulary learning on proficiency measures. Subscales of the VLS are not shown for simplicity. All paths are significant (*p* < .001).

Next, the effect of VLSs as a whole, namely, the overall latent trait—strategic vocabulary learning, on proficiency measures (TOEIC) was examined using structural equation modeling (SEM). For proficiency measures, listening and reading scores of TOEIC were entered into the model. Figure 4.2 illustrates the hypothesized model of the relationship between VLS as a whole and proficiency measures. The goodness-of-fit indexes show that the model fit the data satisfactorily ( $\chi^2/df = 1.78$ , GFI = .87, AGFI = .84, CFI = .92, RMSEA = .05).

Standardized path coefficient from strategic vocabulary learning to TOEIC is .41 ( $p < .001$ ), meaning VLS statistically affect proficiency measured by TOEIC. Considering that prior correlation studies using SILL (Oxford, 1990) reported explained variation of proficiency tests, 60% reported in Takeuchi (1993), and 45% in Dreyer and Oxford (1996), this figure is high because it is a relationship between VLS and proficiency only. This implies that VLS may play some role in learning, and it is a major player in overall proficiency for the average-proficiency level of learners in the current study.

The result of SEM suggests that the strategic vocabulary learning scale developed in the current study has more predictive power of proficiency measures than only one strategy (subscale). The combination of strategies, therefore, can be considered crucial in strategic vocabulary learning and developing the learners' proficiency.

#### **4.5 Summary of Study 2**

Study 2 was conducted to develop and validate a strategic vocabulary learning scale for Japanese university EFL learners with average proficiency level. With three development and validation phases, it was found that the newly developed 25-item questionnaire could serve to measure six subscales of strategic vocabulary learning: (a) Self-management, (b) Input-seeking, (c) Imagery, (d) Writing Rehearsal, (e) Oral Rehearsal, and (f) Association. A series of elaborate statistical analyses demonstrated that the scale has



robust psychometric properties, especially reliability and validity, as a measure of strategic vocabulary learning behaviors. Although Writing Rehearsal might have an extraneous structure, the scale as a whole can tap into the learners' overall ability to coordinate vocabulary learning strategies.

The current study explored a one-to-one correspondence of strategies and proficiency measures as part of validation process, but, because the use of VLSs is affected by a number of factors (Gu, 2003b), exploring the effects of other variables, especially individual differences, on the VLSs will be necessary in Study 3. In addition, since a self-report instrument provides only one source of information about the learners' actual use of strategies, incorporating qualitative methodology such as triangulation research procedures (Takeuchi, 2003a) will be useful in unveiling the complex structure of learning strategies. Study 3 was thus carried out against these backgrounds.

## **Chapter 5: Study 3**

Study 3 addresses the interrelations of vocabulary learning strategies, TOEIC scores, and other related variables. Of the variables, which may affect the choice and use of vocabulary learning strategies, motivation and extracurricular time were chosen in the current study. This is because other variables, for example, learning environments, gender differences, academic majors, age, and nationality, can be controlled in the research design. As for motivation, Oxford and Nyikos (1989) reported that motivation was the strongest influence on the choice of learning strategies. Cohen and Dörnyei (2002) refer to motivation as follows: “Motivation is often seen as the key learner variable because without it, nothing much happens. Indeed, most other learner variables presuppose the existence of at least some degree of motivation” (p. 178). From this perspective, motivation can be regarded as the variable which should be investigated along with vocabulary learning strategies. At the same time, extracurricular time was also included as a variable because study time outside the classes should vary from person to person, and longer extracurricular study time can be regarded as a characteristic of successful learners (Kojic-Sabo & Lightbown, 1999).

### **5.1 Method**

#### **5.1.1 Participants**

Approximately 300 students participated in the study at two private universities in western Japan. One institution was an all-female university, and the other was an all-male university. The participants were those who took a four-month (one semester) TOEIC preparation course provided in their school curriculum. These two institutions were chosen because, in the learning strategies literature, it is reported that gender has a strong influence on strategy use (e.g., Oxford & Nyikos, 1989). Hence, it was considered desirable to make the proportion of males and female almost equal. The age of the participants ranged from 18

(first year) to 22 (fourth year). Through a background questionnaire, learners who began learning English much earlier than others and who have lived overseas more than 10 months were excluded from the sample group.

**5.1.2 Instruments and Data Collection Procedures**

**5.1.2.1 Proficiency Measure**

The participants were required to take the TOEIC Institutional Program (TOEIC IP) within one month of finishing the course and to report their scores. Since some of the participants failed to take the test or respond to the questionnaires described in the following section, listwise deletion left 244 participants (females,  $n = 118$ , humanities majors; males,  $n = 126$ , engineering majors). Table 5.1 shows the results of the TOEIC IP test. As can be seen in Table 5.1, the participants in the current study were false-beginner level learners ( $M = 349.02$ ,  $SD = 89.48$ ).

Table 5.1  
*Results of the TOEIC IP Test (N = 244)*

	<i>M</i>	<i>SD</i>
TOEIC IP Total	349.02	89.48
TOEIC IP Listening	206.70	53.42
TOEIC IP Reading	142.32	45.79

**5.1.2.2 Questionnaires**

The vocabulary learning strategies questionnaire developed in Study 2 was administered to the participants at the end of a four-month course. As a measure of motivation, nine items from the questionnaire developed by Noels, Pelletier, Clément, and

Vallerand (2000) were used.<sup>1</sup> Subscale scores were calculated by averaging the scores of the items in the same subscale (category). Table 5.2 summarizes the descriptive statistics and Cronbach's alpha coefficients (see Appendixes C and D for each questionnaire item). Reliability for all the subscales was relatively high. Since the decisions about factor models were made a priori, the construct validity of the questionnaires was investigated with confirmatory factor analysis (Tabachnick & Fidell, 2006). As a result, the model of vocabulary learning strategies showed a good fit to the data ( $\chi^2/df = 1.62$ , GFI = .88, AGFI = .85, CFI = .94, RMSEA = .05). The model for motivation was within the acceptable range ( $\chi^2/df = 3.44$ , GFI = .93, AGFI = .87, CFI = .94, RMSEA = .09). All the analyses in this study were conducted with SPSS 14.0 and AMOS 5.0.

Table 5.2

*Descriptive Statistics of the Subscales in the Two Questionnaires (N = 244)*

Questionnaire (Scale)	Subscales	No. of Items	<i>M</i>	<i>SD</i>	<i>α</i>
Vocabulary Learning Strategies	Self-management	7	2.36	0.87	.85
	Input-seeking	4	2.23	0.95	.81
	Imagery	5	2.80	0.87	.76
	Writing Rehearsal	3	3.80	1.02	.86
	Oral Rehearsal	3	2.69	1.07	.82
	Association	3	2.55	0.90	.83
Motivation	Extrinsic Motivation	3	3.96	0.77	.73
	Intrinsic Motivation	6	3.15	0.86	.88

### 5.1.2.3 Study Logs and Interview Sessions

As Nation (2001) shrewdly points out, self-report questionnaire data do not always

show what learners actually do and how well they use the strategies. Hence, qualitative analysis was included to forestall these limitations. Throughout the duration of the course, the participants were asked to keep study logs, which were later used to validate the results from the quantitative analysis. At the beginning of the course, the participants were explicitly taught how to write the log. They were specifically directed to record their everyday study time for learning English and the way they had studied (e.g., what kind of strategies or materials they had used).

In addition, follow-up semi-structured interview sessions were held to determine what participants actually did outside the classroom during the course period. A total of 33 individuals were randomly chosen from the participants, and they were interviewed at the end of the course. The participation of the interview sessions was on a completely voluntarily basis. Since the interview sessions took place outside the regular class time, the participants were presented a bookstore gift certificate (valued at ¥1,000). Two or three students were present at a time, and because the interview was carried out in a semi-structured manner, sometimes the participants were able to exchange ideas about how they felt about the questions. It was therefore possible for the interviewer to ask further questions through spontaneous exchange of ideas between the learners. This is why the interview sessions were held by interviewing two or three students at the same time, rather than interviewing them individually. The interview was conducted entirely in Japanese and each session lasted approximately 60 minutes (about 30 minutes for each individual). The questionnaires and the study logs submitted by the informants were provided at each interview session in order to help them recall what they had actually done during the course.

## **5.2 Results and Discussion**

### **5.2.1 Analysis of Correlation Coefficients**

Literature has repeatedly reported that there are positive correlations between the

learning strategies and achievements measured with paper-and-pencil tests (e.g., Dreyer & Oxford, 1996; Gu & Johnson, 1996). Therefore, in an attempt to examine the relationship among TOEIC scores and other variables, the data set was analyzed using correlation coefficients. Presented in Table 5.3 is the result of Pearson correlation coefficients of all the variables investigated.

As a result, moderate levels of correlation were found between TOEIC (total, listening, and reading) scores and Self-management (VLS), Input-seeking (VLS), Intrinsic Motivation, and Time. These results are consistent with many previous studies that have reported some degree of relationship between proficiency/achievement measures and motivation (e.g., Gardner, Trembaly, & Masgoret, 1997), metacognitive strategies (e.g., Nisbet, Tindall, & Arroyo, 2005), or extracurricular study time (e.g., Kojic-Sabo & Lightbown, 1999).

Table 5.3

*Intercorrelations among TOEIC Scores and Other Variables*

	1	2	3	4	5	6	7	8	9	10	11	12
1	—											
2	.92**	—										
3	.86**	.63**	—									
4	.20**	.15*	.23**	—								
5	.39**	.37**	.34**	.46**	—							
6	.03	.02	.03	.27**	.24**	—						
7	-.10	-.14*	-.04	.17**	.14*	.07	—					
8	.12	.10	.12	.29**	.34**	.24**	.19**	—				
9	.15*	.15*	.12	.39**	.30**	.27**	.05	.18**	—			
10	-.02	-.02	-.02	.06	-.02	.04	.12	-.05	-.03	—		
11	.34**	.31**	.30**	.28**	.44**	.17**	.08	.20**	.18**	-.02	—	
12	.29**	.24**	.28**	.21**	.34**	.06	.13*	.02	.12	.08	.35**	—

Note.  $N = 244$ ; \* $p < .05$ , \*\* $p < .01$ ; each number represents variables as follows:

- |                    |                          |                            |                          |
|--------------------|--------------------------|----------------------------|--------------------------|
| 1. TOEIC Total     | 4. Self-management (VLS) | 7. Writing Rehearsal (VLS) | 10. Extrinsic Motivation |
| 2. TOEIC Listening | 5. Input-seeking (VLS)   | 8. Oral Rehearsal (VLS)    | 11. Intrinsic Motivation |
| 3. TOEIC Reading   | 6. Imagery (VLS)         | 9. Association (VLS)       | 12. Time                 |

VLS stands for the subscales of vocabulary learning strategies.

### 5.2.2 Structural Equation Modeling

For the purpose of exploring in detail the relationship of a set of observed variables, latent variables, and measurement error simultaneously, structural equation modeling (SEM) was employed. Prior to conducting SEM, two assumptions of SEM, normal distribution and multivariate normality of the data were checked based on the criteria suggested by Kunnan (1998). For checking normal distribution of the data, skewness and kurtosis were examined and both were within  $\pm 2$  for all the variables, indicating that the data are normally distributed. Next, multivariate normality was checked; however, Mardia's Multivariable Kurtosis Test showed that the assumption of multivariate normality was violated. Thus, seven multivariate outliers were detected and removed from the data set by examining Mahalanobis Distance. In the reanalysis with the remaining 237 individuals, the assumption of multivariate normality was found to be tenable (Mardia's Multivariable Kurtosis Test = 1.70).<sup>2</sup>

Figure 5.1 illustrates a hypothesized model of the relationship among TOEIC scores (proficiency), vocabulary learning strategies as a whole, two motivation subscales, and extracurricular study time. In this analysis, the overall latent trait of strategic vocabulary learning, instead of six subscales, was used in the model because this second-order confirmatory factor analysis model was validated in Study 2. As a result, the fit index figures indicate that the model fit the data moderately ( $n = 237$ ,  $\chi^2/df = 1.59$ , GFI = .82, AGFI = .80, CFI = .91, RMSEA = .05).

The resulting model exhibits that when looking at the paths to the TOEIC scores, the path from Vocabulary Learning Strategies is the strongest among the four (standardized path coefficients = .31). This exemplifies that committing oneself to learning vocabulary results in higher scores in the TOEIC. With extremely small correlation coefficients all paths from Extrinsic Motivation were not significant, indicating that those who feel they were forced to

study did not produce any tangible outcomes. Two paths from Intrinsic Motivation to vocabulary learning strategies (standardized path coefficients = .50) and extracurricular study time (.27) were significant. This finding might suggest that learners with higher intrinsic motivation use more vocabulary learning strategies and spend more time learning English, which of course is likely to be reflected in the TOEIC scores.

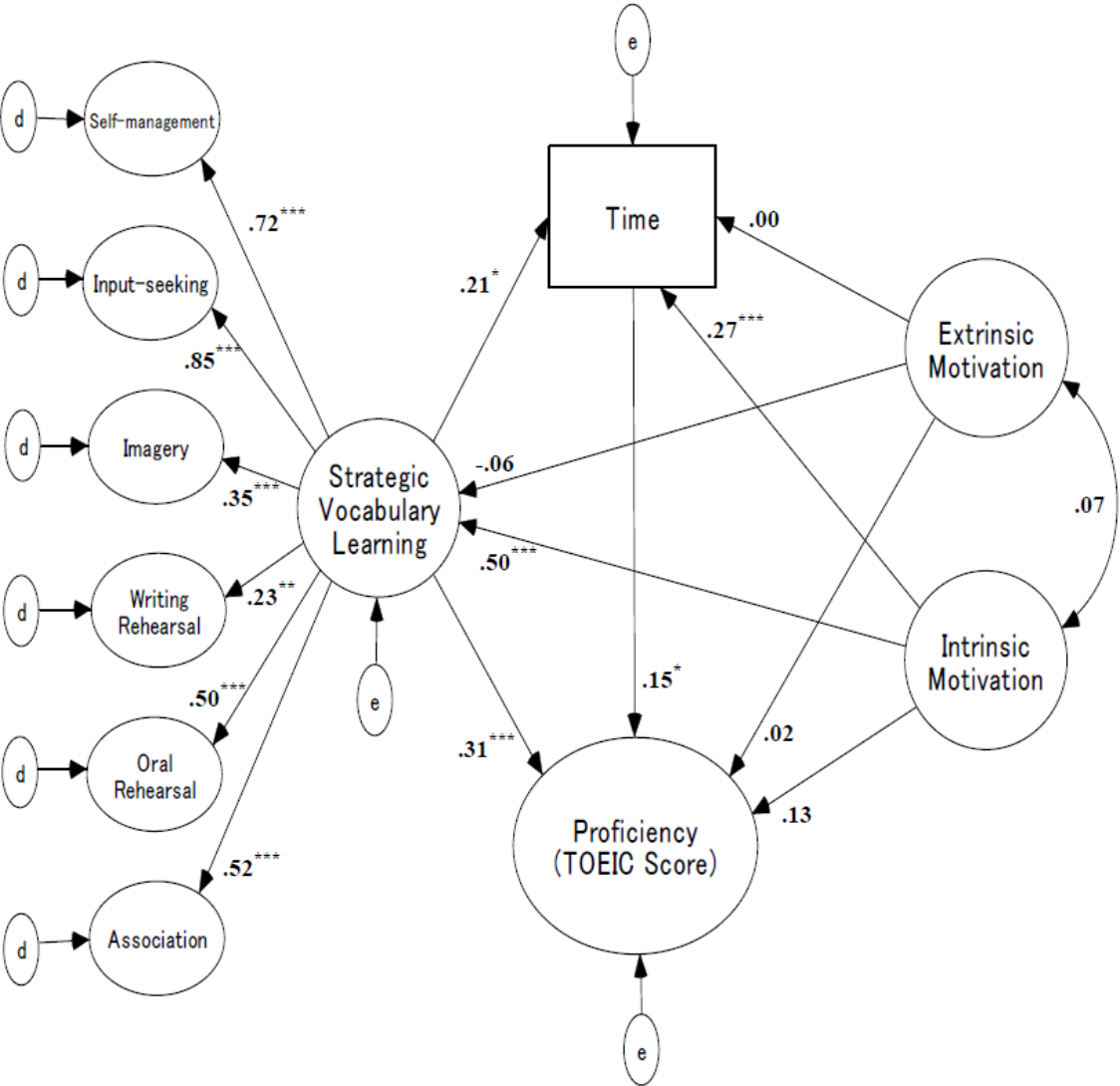


Figure 5.1. Relationships among the scores and the variables ( $n = 237$ ). \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Numbers on each path are standardized estimates. Observed variables are omitted in this figure.



## 5.2.2 Cluster Analysis

Next, cluster analysis, which can shed light on individual differences (e.g., Skehan, 1989), was conducted. In applying cluster analysis, the Ward method with the squared Euclidean distance technique was used because this combination has been referred to as the most suitable to reveal individual differences (Yamamori, Isoda, Hiromori, & Oxford, 2003). The following variables were first transformed into *z*-scores and then entered in cluster analysis: (a) the TOEIC listening score, (b) the TOEIC reading score, (c) Vocabulary Learning Strategies (VLS): Self-management, (d) VLS: Input-seeking, (e) VLS: Imagery, (f) VLS: Writing Rehearsal, (g) VLS: Oral Rehearsal, (h) VLS: Association, (i) Extrinsic Motivation, (j) Intrinsic Motivation, and (k) Extracurricular Study Time.

By examining the dendrogram, which is a tree-like graphic display of the distances between each combining cluster, it was decided that the participants could be divided into three groups. The judgment was then confirmed with one-way ANOVA, in which statistically significant differences were found among the three groups ( $p < .05$ ).<sup>3</sup> Figure 5.2 describes the results of cluster analysis, illustrated in *z*-scores (0 being the average). In addition, the descriptive statistics of each cluster and the results of post hoc tests (Tukey's multiple comparison technique)<sup>4</sup> are presented in Table 5.4 with raw scores.

The learners in Cluster 1 attained the highest TOEIC reading and listening scores in the three groups. Even though their use of Imagery in vocabulary learning strategies is less frequent, the dichotomy can be explained with their high scores in Input-seeking (VLS), Intrinsic Motivation, and Time. This means that they are superior in exercising their metacognitive strategies with high motivation and spend a lot of time on learning English.

The learners in Cluster 2 had average TOEIC scores. While these learners reported active use of vocabulary learning strategies, in some cases the most frequent in the three groups (Imagery;  $M = 3.46$ ), that was not reflected in the outcomes (the TOEIC scores). One possible interpretation of this result is that while they do use strategies, they are not

using them effectively (e.g., Yamamori et al., 2003) or earnestly. Their extracurricular study time, which is about average among the three groups, more or less proves this point. That is, they might not be trying hard enough to improve their proficiency in spite of having knowledge of learning strategies.

Learners in Cluster 3, whose TOEIC scores are not statistically different from those in Cluster 2, can be regarded as low-motivated, poor strategy users. Also, their scores of Extrinsic Motivation are about the same as those of learners in Cluster 2. This shows that they externally feel they need to study English, but they may actually not try or simply do not know how to study in the first place.

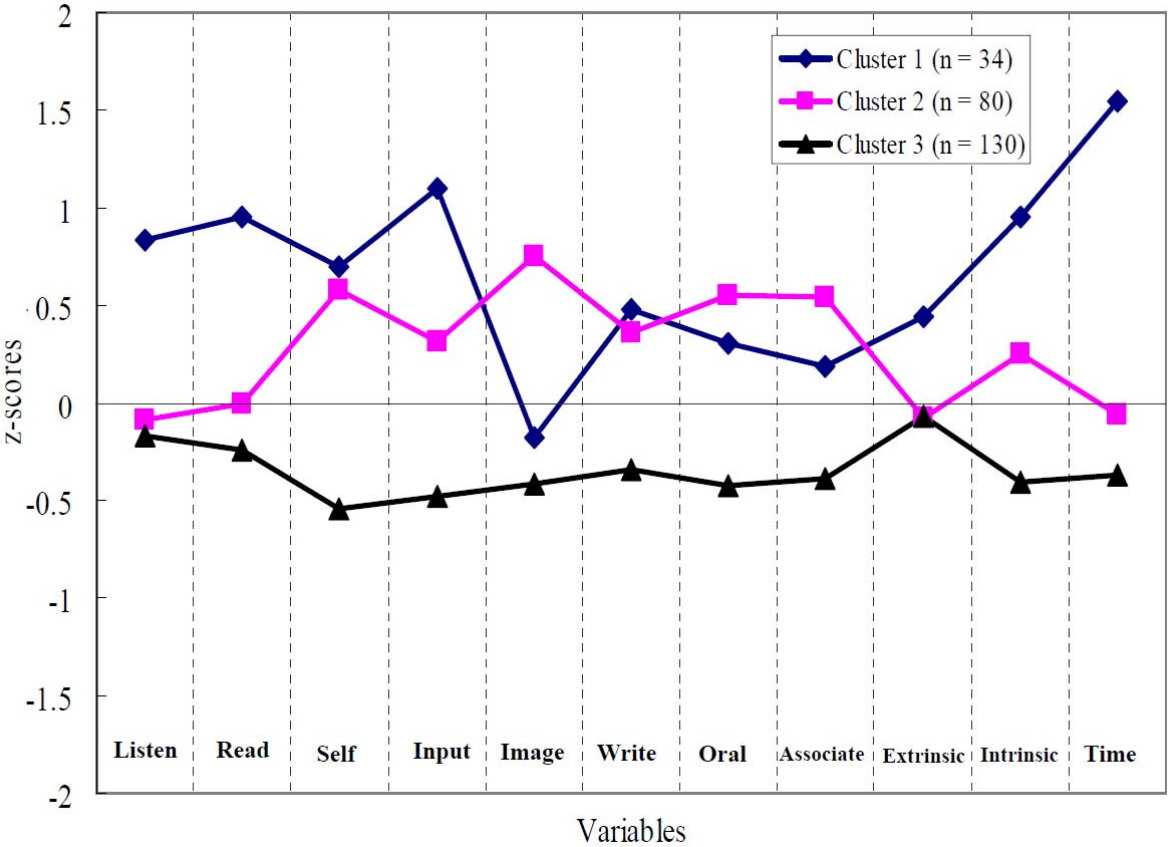


Figure 5.2. Cluster profiles of three groups expressed in z-scores. For each variable, refer to Table 5.4.

Table 5.4

*Descriptions of Each Cluster*

	Cluster 1 ( <i>n</i> = 34)	Cluster 2 ( <i>n</i> = 80)	Cluster 3 ( <i>n</i> = 130)	Significant in post hoc test (Clusters)
TOEIC Listening	251.47 (58.60)	202.31 (46.03)	197.69 (50.76)	1-2, 1-3
TOEIC Reading	185.88 (42.31)	142.06 (44.96)	131.08 (40.33)	1-2, 1-3
Self-management	2.96 (0.92)	2.87 (0.79)	1.89 (0.59)	1-3, 2-3
Input-seeking	3.34 (0.97)	2.59 (0.86)	1.83 (0.68)	1-2, 1-3, 2-3
Imagery	2.65 (0.68)	3.46 (0.81)	2.44 (0.71)	1-2, 2-3
Writing Rehearsal	4.30 (0.81)	4.17 (0.93)	3.45 (1.00)	1-3, 2-3
Oral Rehearsal	3.02 (0.94)	3.28 (1.00)	2.24 (0.93)	1-3, 2-3
Association	2.72 (0.64)	3.04 (1.02)	2.21 (0.73)	1-3, 2-3
Extrinsic Motivation	4.30 (0.64)	3.90 (0.91)	3.91 (0.68)	1-2, 1-3
Intrinsic Motivation	3.97 (0.67)	3.37 (0.69)	2.81 (0.81)	1-2, 1-3, 2-3
Study Time	9.92 (2.97)	4.85 (2.31)	3.89 (2.39)	1-2, 1-3, 2-3

*Note.* Mean (Standard Deviation); For all significant pairs in post hoc test,  $p < .05$

### 5.2.3 Analyses of Study Logs and Interview Sessions

Qualitative analyses were then conducted in an attempt to examine more detailed, true learning behaviors of the participants. 33 individuals were randomly chosen from the participants (Cluster 1,  $n = 6$ ; Cluster 2,  $n = 12$ ; Cluster 3,  $n = 15$ ). Their study logs, along with their utterances at the interview sessions, which were recorded with their permission and later transcribed, were analyzed especially to interpret the characteristics found in cluster analysis.

Learners of Cluster 1 can be classified as “learners with clear goals” according to cluster analysis. In the interview, many participants commented that they had a specific career orientation in the future and hoped to get a job, which requires some degree of English proficiency (e.g., a cabin attendant or a hotel clerk). The number of descriptions in their study logs was larger than those made by learners in other clusters. Their study logs show that they were consciously engaged in learning English, independently studying with materials not used in the course. They especially seemed to feel learning vocabulary was the first and foremost priority in preparing for the TOEIC test. One interviewee stated:

*Vocabulary learning is the most important thing in learning English. I can make out the meaning of a sentence if I know the meaning of the words. If I can translate the sentences, that means I can answer the questions on the test. ... To remember the meaning of the words, first I write them on a vocabulary card and read them out repeatedly. If that does not work out, I use a keyword mnemonic technique. When it comes to remembering words, I think I should use many stimuli. (T4-TC2, translation ours.)*

Learners in Cluster 2 and Cluster 3 show very similar TOEIC scores; however, their strategy use was considerably different. Learners in Cluster 2 reported more frequent use of vocabulary learning strategies. In the interviews, many students mentioned that they had some knowledge of vocabulary learning strategies from their previous learning experience, such as preparing for entrance examinations when they were high school students. However, it was observed from their study logs that most of their efforts during the course period consisted of nothing but the assigned homework. Thus, they simply did not apply their knowledge of strategies consistently or earnestly towards improving their proficiency. One learner commented at the interview:

*When it is necessary to study English, I can try harder, but at the moment, I am busy with my part-time work and assignments of other classes. I wish I could spend more time on learning English. (T2-MM4, translation ours.)*

This comment shows the importance of planning one's learning, and just knowing strategies is not enough—learners must apply them consciously. The important thing is setting specific learning goals and making efforts to achieve them. This idea is in line with “structured approach” reported by Sanaoui (1995), which was the main characteristic of successful learners in her study. Learners in Cluster 3 made very few entries in their study logs. In the interview, many of them commented that they were taking the course because they thought they would need to use English at work in the future. However, they repeatedly remarked that when and where they would need to do so was ambiguous. One participant noted:

*I want to be a public servant. I think it will be necessary to get a high score in TOEIC. I study for TOEIC only because it is required, and I find it something unlikable. (M4-SH1, translation ours.)*

Most of them reported that they would not study outside the classroom because they thought by attending the TOEIC preparation course they could get a higher score. These attitudes were mirrored in their less-frequent strategy use, low motivation, and modest study time outside the classroom.

### **5.3 Summary of Study 3**

The present study examined the relationships among vocabulary learning strategies,

motivation, study time, and TOEIC scores. Before making concluding remarks, one limitation should be pointed out. As the TOEIC IP scores indicated, the participants of this study were composed mostly of homogeneous and false-beginner level learners. Studies with more proficient learners, therefore, should be conducted to corroborate the findings in the current study.

With this limitation in mind, the results of this study show that among vocabulary learning strategies, metacognitive strategies (Self-management and Input seeking) were more highly correlated with the TOEIC scores. Intrinsic Motivation and extracurricular study time showed higher correlations with the TOEIC scores as well. In SEM, these findings were reconfirmed; furthermore, vocabulary learning strategies as a whole had the greatest influence on the TOEIC scores. It was also found that Intrinsic Motivation contributed heavily to vocabulary learning strategies.

The results of Study 3 stress the importance of vocabulary learning strategies on the proficiency measured by the TOEIC test. Especially, since vocabulary learning strategies as a whole had a greater influence on proficiency (with TOEIC scores) than intrinsic motivation or study time alone had, the significance of vocabulary learning strategies in enhancing the proficiency level was confirmed. Individual variables such as intrinsic motivation per se might not lead to better learning outcomes; they thus should be accompanied by strategic vocabulary learning behaviors. In other words, how learners approach vocabulary learning strategically matters in their development of proficiency. As it was found that learners with higher TOEIC scores had clear goals and attended to vocabulary learning strategies in conscious, coordinated, and structured manners, teaching vocabulary learning strategies along with these characteristics will be useful for our students in improving their proficiency.

In cluster analysis, three distinct groups emerged as a result. From their cluster profiles and qualitative analyses using study logs and interviews, it was found that (a)

learners with higher TOEIC scores had clear goals and attended to vocabulary learning strategies in conscious, coordinated, and structured manners, (b) even though some learners possessed knowledge of strategies, they did not apply them to their everyday learning situations, and (c) learners without clear objectives were those who reported less frequent strategy use and low motivation.

The above-mentioned results suggest that orchestrating vocabulary learning strategies, in tandem with other individual differences such as intrinsic motivation, plays a pivotal role in promoting the proficiency measured by the TOEIC test.

In light of the findings from the two current studies, further studies should be conducted especially on instruction of vocabulary learning strategies. Since a number of studies have reported the success of strategy instruction (e.g., Cohen, Weaver, & Li, 1995; Ikeda, 2007; Ozeki, 2000; Rasekh & Ranjbar, 2003), it can be hypothesized that giving such strategy instruction to learners (as the ones in the current studies) could make them more conscious, effective, and consistent users of learning strategies. Moreover, for those who use fewer strategies, it could be a good starting point for them to become more empowered learners.

## Notes

1. We used the items translated into Japanese by Tanaka and Maeda (2004). This questionnaire was originally based on the self-determination theory (see Hiromori, 2006a). In the taxonomy of Noels, Pelletier, Clément, and Vallerand (2000), the three items for extrinsic motivation used in the current study are termed as “External Regulation” and the six items for measuring intrinsic motivation are categorized into “Intrinsic Motivation - Knowledge” and “Intrinsic Motivation - Accomplishment.”
2. If the Mardia’s Multivariable Kurtosis Test is less than 1.96, the data can be regarded as

possessing multivariate normality (In'nami, 2006, p. 326).

3. Specifically, TOEIC Listening:  $F(2, 241) = 15.77, p < .01, \omega = .33$ ; TOEIC Reading:  $F(2, 241) = 22.76, p < .01, \omega = .39$ ; Self-management:  $F(2, 241) = 60.37, p < .01, \omega = .57$ ; Input-seeking:  $F(2, 241) = 57.42, p < .01, \omega = .56$ ; Imagery:  $F(2, 241) = 47.31, p < .01, \omega = .52$ ; Writing Rehearsal:  $F(2, 241) = 19.34, p < .01, \omega = .36$ ; Oral Rehearsal:  $F(2, 241) = 31.70, p < .01, \omega = .45$ ; Association:  $F(2, 241) = 26.45, p < .01, \omega = .42$ ; Extrinsic Motivation:  $F(2, 241) = 4.02, p < .05, \omega = .16$ ; Intrinsic Motivation:  $F(2, 241) = 36.82, p < .01, \omega = .48$ ; Extracurricular Study Time:  $F(2, 241) = 81.88, p < .01, \omega = .63$ .
4. Since the sample sizes were different, the results were also reconfirmed with the Games-Howell procedure (Field, 2005, p. 341).



## Chapter 6: Study 4

### 6.1 Background

Although a number of studies on VLS instruction have contributed to a better understanding of its effectiveness (see 2.2.5), such studies have a few limitations. First, the studies on memory strategies have focused on isolated strategies such as the keyword method. As O'Malley and Chamot (1990) emphasized, however, our understanding of VLS instruction might benefit from examining “a training system in which multiple strategies are taught within a single package” (p. 169). Additionally, considering the importance of metacognitive strategies in VLS in the literature, they should be taught in combination with other cognitive strategies. Second, the instruction period in past VLS research tended to vary greatly from study to study. The majority of researchers favoring strategy instruction propose that it can be the most successful when incorporated into the regular classroom instruction (McDonough, 1999). If we aim to incorporate VLS in this manner, the instruction period should span more than a few lessons. No study, however, has addressed this issue thus far. Finally, no previous study has investigated learners' initial repertoire of VLS and how such instruction has caused them to change their strategies.

Addressing these shortcomings of the previous studies on VLS instruction, the present study aims to answer the following research questions by providing explicit instruction on VLS in combination with the regular classroom instruction for 10 weeks to Japanese EFL university students:

1. Are there any differences between the experimental group and control group after 10 weeks of VLS instruction? If any, in which strategies do the differences emerge?
2. Are there any differences within the experimental group that are based on the learners' initial repertoire of VLS? If so,
3. What are the reasons behind these differences?

## **6.2 Method**

The experimental group received VLS instruction during the 10-week course; however, the control group only received the regular classroom instruction. In order to answer the first research question, we administered questionnaires to both groups before and after the course. We then compared the results of the two groups. For the second research question, we focused on the experimental group. First, using a cluster analysis, the experimental group was divided according to the learners' initial repertoire of VLS. Next, the pretest and posttest scores were compared within the experimental group. Finally, for the third research question, we once again focused on the experimental group and investigated the qualitative data collected from the participants in the group.

### **6.2.1 Participants and Instruments**

A total of 204 female EFL learners from two private universities (116 and 88 learners, respectively) in western Japan participated in the current study. Their ages ranged from 18 (first year) to 22 (fourth year), and all were majoring in humanities. Since the participants were divided into an experimental group and a control group based on their institutions, random assignment of the participants was unfeasible. Therefore, we used a vocabulary test developed by Mizumoto and Shimamoto (2008) to form the two groups. The rationale behind the use of this vocabulary test is that lexical competence is a crucial factor in almost all the aspects of L2 proficiency (e.g., Zareva, Schwanenflugel, & Nikolova, 2005). This is especially true for an EFL setting, where exposure to English in everyday life is either very limited or nonexistent. Therefore, the test would enable us to obtain not only the learners' vocabulary knowledge but also an overall picture of their proficiency levels. In addition, we chose this vocabulary test for the current study because Aizawa (1998) pointed out several problems (e.g., the difficulty of understanding definitions) related to using the Vocabulary

Levels Test (Nation, 1990)—the most widely-used standardized vocabulary measurement test—for Japanese EFL learners.

The vocabulary test used in the current study originally had 160 items, each with four multiple-choice options. The target words were selected from the JACET8000 word list (JACET, 2003), which was compiled specifically for Japanese EFL learners—this is another reason why we considered this instrument to be more appropriate for the current study. Of the 160 items, 25 items that contained the target words that were taught during the course were selected and included in the analyses. The same test was readministered at the end of the course to measure the improvements in vocabulary knowledge.

Based on the results of the pre vocabulary test, a matching procedure (Dörnyei, 2007) was used to divide the participants into two groups—an experimental group ( $n = 76$ ) and a control group ( $n = 70$ ). The mean scores of the vocabulary test were 15.80 ( $SD = 2.91$ ) for the experimental group and 15.41 ( $SD = 2.99$ ) for the control group. A two-tailed independent t-test confirmed that a statistically significant difference did not exist between the results of the two groups ( $t = 0.79$ ,  $df = 144$ ,  $p = .43$ ,  $r = .07$ ). Therefore, they were considered to be equal in terms of vocabulary knowledge.

The program in which they were enrolled was a TOEIC (Test of English for International Communication) test preparation course, and both the experimental and control groups were provided identical contents and materials. The study took place between September 2006 and January 2007 for approximately four months, which is the typical period spanned by one semester in Japanese universities. The participants' proficiency was measured by their TOEIC IP (Institutional Program) scores (experimental group:  $n = 69$ ,  $M = 436.38$ ,  $SD = 105.16$ ; control group:  $n = 54$ ,  $M = 429.38$ ,  $SD = 118.09$ ).<sup>1</sup> According to the TOEIC Steering Committee (2006), the mean TOEIC scores for university students majoring in humanities and engineering are 474 and 397, respectively. Therefore, the participants of this study can be regarded as average or lower-level university EFL

students.

A VLS questionnaire was administered to all the participants at both the beginning and end of the course. This questionnaire was developed to measure learners' intentional vocabulary learning behaviors while they are in the process of memorizing new vocabulary (cognitive strategies) and coordinating their strategic behaviors (metacognitive strategies). It was confirmed in Study 2 that the questionnaire could function as a psychometrically valid scale. The substrategies (subscales) of the overall intentional vocabulary consolidation learning strategies include the following: (a) Self-management, (b) Input-seeking, (c) Imagery, (d) Writing Rehearsal, (e) Oral Rehearsal, and (f) Association.

In addition to the VLS questionnaire, as a measure of extrinsic and intrinsic motivation, nine items from the questionnaire developed by Noels, Pelletier, Clément, and Vallerand (2000) were utilized. Motivation measures were included primarily because (a) in related literature, motivation is considered to have the strongest influence on the choice of learning strategies (Oxford & Nyikos, 1989) and (b) the results of Study 3 showed they have a considerable effect on VLS use.

Both the questionnaires used a 5-point Likert scale, with 1 indicating “not at all true of me” and 5, “very true of me.” The items of each questionnaire are presented in Appendixes C and D. The score for each substrategy was calculated by averaging each item's score. Since we were using a questionnaire established in a previous study, the construct validity of the questionnaires was investigated through a confirmatory factor analysis (Tabachnick & Fidell, 2006). According to the result, the model for VLS showed an acceptable fit to the data ( $\chi^2 = 419.55$ ,  $df = 260$ , CFI = .906, GFI = .817, RMSEA = .065).<sup>2</sup> The model for motivation was also within the acceptable range ( $\chi^2 = 69.19$ ,  $df = 26$ , CFI = .964, GFI = .934, RMSEA = .085). All the analyses in this study were conducted using SPSS 14.0 and AMOS 5.0. Table 6.1 presents the descriptive statistics of the pretest instruments.

Table 6.1

*Descriptive Statistics of the Pretest Instruments*

	No. of Items	Possible Range	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>α</i>
Self-management (VLS)	7	1-5	2.57	0.75	0.46	0.53	.80
Input-seeking (VLS)	4	1-5	3.16	0.94	-0.03	-0.50	.87
Imagery (VLS)	5	1-5	3.08	0.80	0.15	0.16	.79
Writing Rehearsal (VLS)	3	1-5	3.72	0.92	-0.31	-0.52	.77
Oral Rehearsal (VLS)	3	1-5	3.17	1.00	0.19	-0.63	.87
Association (VLS)	3	1-5	2.55	0.88	0.13	-0.04	.88
Extrinsic Motivation	3	1-5	3.53	0.89	-0.15	-0.57	.74
Intrinsic Motivation	6	1-5	3.50	0.87	-0.21	-0.46	.87
Vocabulary Test	25	0-25	15.62	2.95	-0.33	-0.10	.66

*Note.* *N* = 146.

### 6.2.2 Qualitative Data Collection Procedures

Some researchers (e.g., Denzin, 1997; Dörnyei, 2007) recommend method triangulation wherein the findings are based on not only a primary source but also a secondary source of information. Following this recommendation, we incorporated qualitative analyses into this study in order to clarify the causes of the findings obtained through the quantitative data sources, namely, the questionnaires and vocabulary test. Specifically, the learners in the experimental group were asked to maintain study logs throughout the course, and interview sessions were conducted with them at the end of the course. The participants were directed to record the details of their daily study of English

and the VLS and materials that they used each day.

In addition, follow-up interview sessions were conducted to determine the strategies that the participants employed outside the classroom during the course. A total of nine individuals, who were randomly chosen from among the participants in of the experimental group, were interviewed. Participation in the interview sessions was completely voluntarily. Furthermore, since the interview sessions took place outside of the regular class time, the participants were presented with a bookstore gift certificate (valued at ¥1,000). At least two students were interviewed in each session, and due to the semi-structured nature of the interviews, the participants were able to exchange ideas on how they feel about the various strategies.

All the interviews were conducted in Japanese, and each session lasted approximately 45 minutes (about 20 minutes per individual). The questionnaires and study logs submitted by the participants were provided at each interview session to help them recall what they actually had done during the course. With the participants' consent, the interviews were recorded with an IC recorder and subsequently transcribed.

### **6.2.3 Investigation of the Initial Repertoire of VLS**

After the administration of the VLS and motivation questionnaires and the vocabulary test at the beginning of the course, the participants in the experimental group were grouped using a cluster analysis, which was based on their initial repertoire of VLS. The Ward method with the squared Euclidean distance technique was used in applying the cluster analysis. This particular method was chosen because the combination has been known to “combine clusters with a small number of observations, and produce clusters with approximately the same number of observations,” (Hiromori, 2006b, p. 7) and thus, it is highly suitable for revealing individual differences (Yamamori, Isoda, Hiromori, & Oxford, 2003).

Figure 6.1 illustrates the cluster profiles of the three groups, and Table 6.2 presents the scores, standard deviations, and results of the post hoc tests (Tukey's multiple comparison technique). All the scores of the variables investigated (those in Table 6.1) were first transformed into z-scores and then entered into the cluster analysis. This is because the unit of measurement of the vocabulary test results was different from that of the questionnaires. Based on a dendrogram, it was decided that the participants could be divided into three groups. This decision was supported by a one-way ANOVA, which revealed statistically significant differences for all the variables ( $p < .05$ ).

The learners belonging to Cluster 1 can be referred to as the "less frequent strategy users." Compared with the other two groups, their overall use of strategies was lower, and they mostly relied on writing rehearsal strategies. On the other hand, the learners in Cluster 2 were "active strategy users." They reported coordinating several strategies more often than did the learners in Clusters 1 and 3. They used the self-management and input-seeking strategies—which are metacognitive strategies—more frequently, and they had the highest intrinsic motivation of the three groups. Those in Cluster 3 were "moderate strategy users." As can be seen in Figure 6.1, the profile of their strategy use lies just between those of Clusters 1 and 2. From these results, it was assumed that the three groups were different in terms of their strategy use at the beginning of the course.

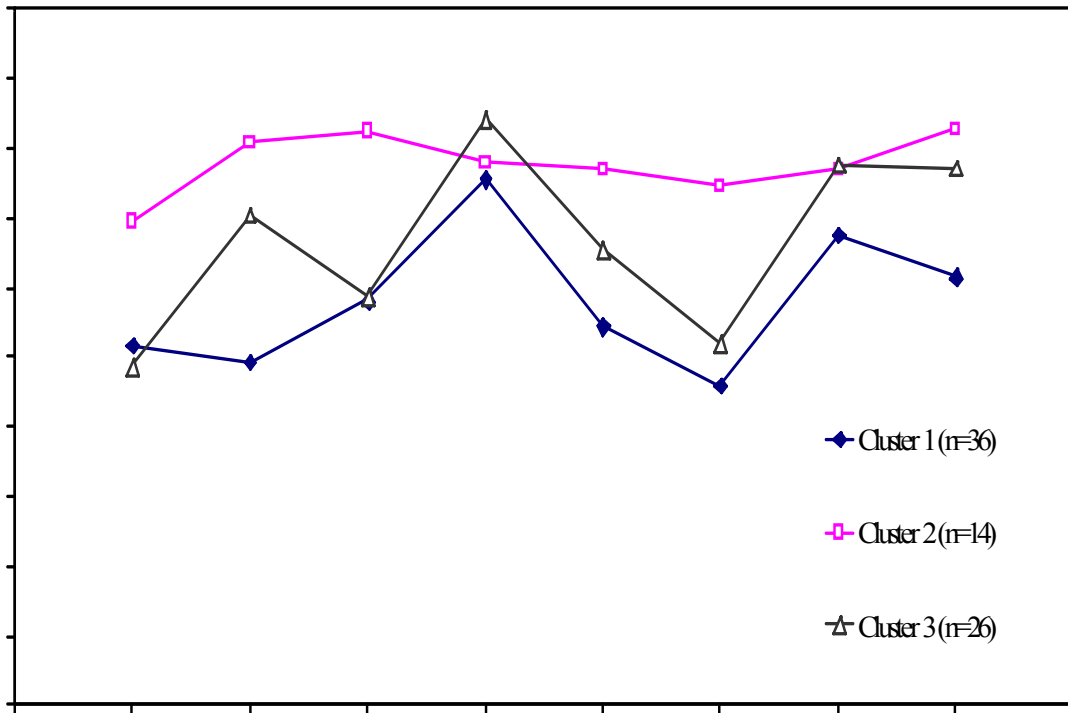


Figure 6.1. Cluster profiles of VLS among the three groups before the treatment.

Table 6.2

*Descriptions of Each Cluster*

	Cluster 1 (n = 36)	Cluster 2 (n = 14)	Cluster 3 (n = 26)	Significant in post hoc test
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
Self-management	2.59 (0.63)	3.48 (0.82)	2.43 (0.58)	Clusters 1-2, 2-3
Input-seeking	2.47 (0.74)	4.04 (0.61)	3.53 (0.77)	Clusters 1-2, 1-3
Imagery	2.91 (0.73)	4.13 (0.64)	2.94 (0.54)	Clusters 1-2, 2-3
Writing Rehearsal	3.78 (0.79)	3.91 (1.06)	4.21 (0.78)	—
Oral Rehearsal	2.72 (0.85)	3.86 (1.04)	3.27 (0.78)	Clusters 1-2, 1-3
Association	2.30 (0.78)	3.74 (0.72)	2.60 (0.57)	Clusters 1-2, 2-3
Extrinsic Motivation	3.38 (0.77)	3.86 (0.79)	3.88 (0.86)	Clusters 1-3
Intrinsic Motivation	3.08 (0.77)	4.14 (0.63)	3.86 (0.93)	Clusters 1-2, 1-3
Vocabulary Test	14.42 (2.16)	16.43 (3.78)	17.38 (2.43)	Clusters 1-2, 1-3

Note. For all significant pairs in post hoc test:  $p < .05$



#### **6.2.4 Instruction of VLS**

In the experimental group, students whose strategy use differed were instructed to sit near each other in the classroom so that they could interact and exchange their ideas and opinions about the strategies being taught during the training session. This type of interaction was included to help promote scaffolding in the zone of proximal development (ZPD; e.g., van Lier, 2004) wherein learners with different types of strategies can help each other by sharing how they approach the task at hand.

Both the experimental and control groups attended one class per week (90 minutes). For the experimental group, a set of the cognitive and metacognitive strategies presented in Table 6.3 was taught explicitly during the regular class, with each VLS instruction lasting approximately 30 minutes. The instruction took place in the first 30 minutes of a 90-minute class. On the other hand, the control group spent the same amount of time on other activities such as reviewing the previously taught contents not related to vocabulary learning.

The target strategies were chosen based on the findings of previous VLS research (e.g., Fan, 2003; Gu & Johnson, 1996; Schmitt, 1997) and on the vocabulary that was to be taught in each lesson. With regard to the instruction method, we chose explicit strategy instruction because the existing strategy instruction models place much emphasis on its importance (Chamot, Barnhardt, El-Dinary, & Robbins, 1999; Cohen, 1998; Oxford, 1990; Wenden, 1991). Among the various strategy training frameworks (Dörnyei, 2005, p. 174), we based our method of instruction on the model proposed by Chamot et al. (1999) due to its simplicity and the ease with which learners can follow it.<sup>3</sup> The order of instruction was as follows: (1) preparation, (2) presentation, (3) practice, (4) expansion, and (5) evaluation.

Table 6.3

*Schedule of VLS Instruction*

Week	Cognitive Strategies	Metacognitive Strategies
1	Pre questionnaire and vocabulary test	
2	Vocalization of the words, phrases, and sentences	+ Conscious preview
3	Use of collocations or phrases	+ Start of vocabulary learning with a preview
4	Imagery strategies	+ Expansion of one's own way of learning vocabulary
5	Writing and oral rehearsal	+ Conscious input of English vocabulary
6	Grouping of semantically-related words	+ Target-setting in vocabulary learning
7	Mnemonics (keyword methods)	+ Aim of designating time for vocabulary learning
8	Association of the target words with familiar synonyms or antonyms	+ Attempts to actually use new words while learning new vocabulary
9	Use of prefixes and suffixes (or stems)	+ Testing vocabulary regularly
10	Effective use of vocabulary notes or cards	+ Goal to remember a certain number of words
11	Review & post questionnaire and vocabulary test	

*Note.* The students were instructed in both cognitive and metacognitive strategies.

In each lesson, the instructor prepared a handout containing certain target words taken from the course textbook and corresponding example sentences. Gu (2003b) states that “the choice, use, and effectiveness of VLS depend on the task, the learner, and the learning context.” Correspondingly, the participants’ task in this study was to learn the target words

by using the strategies introduced in each lesson. In addition to the handout, a slideshow introducing and explaining the effectiveness of each vocabulary learning strategy was shown during the presentation phase.

During the practice stage, the instructor explicitly introduced and demonstrated the target strategies, and the students applied them to learning vocabulary while discussing their use with classmates. They also had an opportunity to discuss whether they use such strategies often while they learn and how they feel about the target strategies or the possible applications of the strategies being taught. Following the practice stage, as an initial evaluation, the participants were asked to answer the following questions according to a five-point scale: (a) whether they were already using the strategies, (b) how useful they felt the strategies were, (c) how suitable they thought the strategies were to them, and (d) whether they felt that they would like to try using the strategies.

For the expansion and the second evaluation phases, the learners applied the strategies introduced for an assignment and recorded their evaluation of the strategy's usefulness in the study logs. They were directed to experiment with the introduced strategy and then report in the study log whether or not they thought that the VLS would suit them. For the assignments, they were allowed to use other VLS in addition to the one introduced in the previous lesson. However, the use of the target VLS was mandatory. In the following lesson, the students were required to submit their study logs and take a review quiz of the target vocabulary.

With respect to the control group, another instructor conducted regular classes with the same materials as the ones used by the experimental group. Thus, the learners also received handouts containing target words from the course textbook and corresponding example sentences; however, they were not required to maintain a study log. Moreover, caution was taken to ensure that the control group was not taught anything related to VLS during the lessons. Thus, the differences in treatment between the experimental and control

groups were whether or not (a) the participants were required to maintain a study log and (b) they received VLS instruction in the classroom.

## 6.3 Results and Discussion

### 6.3.1 Research Question 1

*Are there any differences between the experimental and control groups after 10 weeks of VLS instruction? If any, in which strategies do the differences emerge?*

Table 6.4 summarizes the scores and corresponding standard deviations for all the variables investigated before and after the course for both the groups and the gains with regard to their scores after the treatment. The gains in the scores were tested with the Bonferroni adjustment to control for Type I error inflation.

In order to examine whether there were significant differences with respect to the VLS questionnaire or the vocabulary test by the intervention studies, a 2 (Group)  $\times$  2 (Time) repeated measures multivariate analysis of variance (MANOVA) was conducted. In order to apply MANOVA, the following three conditions must be satisfied (Weinfurt, 1995, p. 253): (a) multivariate normality, (b) homogeneity of the variance-covariance matrices, and (c) independence of observations. Therefore, prior to carrying out the MANOVA, we confirmed that the data met these conditions.

The result of MANOVA revealed a significant multivariate main effect for both Group [Wilks's  $\Lambda = .85$ ,  $F(9, 136) = 2.73$ ,  $p < .05$ ,  $\eta^2 = .15$ ] and Time [Wilks's  $\Lambda = .67$ ,  $F(9, 136) = 7.54$ ,  $p < .01$ ,  $\eta^2 = .33$ ]. More importantly, there was a significant Group  $\times$  Time interaction [Wilks's  $\Lambda = .80$ ,  $F(9, 136) = 3.75$ ,  $p < .05$ ,  $\eta^2 = .20$ ]. This interaction effect indicates that a difference does exist between the experimental and control groups based on the linear combination of all the dependent variables investigated.

Follow-up univariate repeated ANOVAs for each dependent variable revealed that the

main effect of time (gain before and after the treatment) was significant for all the variables, with the exception of Writing Rehearsal and Extrinsic Motivation. The most important finding in this particular analysis is that the interaction between group and time was significant for Input-seeking [ $F(1, 144) = 4.98, p < .05, \text{partial } \eta^2 = .03$ ] and Oral Rehearsal [ $F(1, 144) = 11.69, p < .01, \text{partial } \eta^2 = .08$ ]. This interaction effect (illustrated in Figure 6.2) strongly suggests that the change in these two dependent variables over time is associated with the intervention studies, namely, the instruction of VLS. In addition, the interaction between group and time was significant for the vocabulary test [ $F(1, 144) = 14.40, p < .01, \text{partial } \eta^2 = .09$ ], indicating that the experimental group outperformed the control group after receiving VLS instruction.

From these results, it can be concluded that the instruction of VLS produced the difference in results between the experimental and control groups, specifically with respect to the input-seeking and oral rehearsal strategies and the vocabulary test. Even though the interaction effect was not detected, the gains in terms of the use of imagery and association strategies for the control group were also statistically significant. A possible interpretation of this result is that the course contents, namely, the TOEIC preparation material, may have affected the use of these strategies.

Table 6.4

Scores, Standard Deviations, and Gains in the Two Groups

	Experimental (n =76)				Control (n =70)			
	Pretest	Posttest	Gain	$\Delta$	Pretest	Posttest	Gain	$\Delta$
	M (SD)	M (SD)			M (SD)	M (SD)		
Self-management	2.70 (0.75)	2.85 (0.79)	0.15	0.20	2.42 (0.74)	2.54 (0.80)	0.12	0.16
Input-seeking	3.12 (0.97)	3.41 (0.89)	0.29*	0.30	3.21 (0.92)	3.24 (0.99)	0.03	0.03
Imagery	3.14 (0.80)	3.23 (0.94)	0.09	0.11	3.02 (0.80)	3.20 (0.82)	0.18*	0.23
Writing Rehearsal	3.95 (0.85)	3.91 (0.99)	-0.04	-0.05	3.46 (0.93)	3.60 (1.10)	0.13	0.15
Oral Rehearsal	3.12 (0.96)	3.60 (0.90)	0.48*	0.50	3.22 (1.05)	3.19 (1.04)	-0.03	-0.03
Association	2.67 (0.87)	3.00 (0.94)	0.33*	0.38	2.41 (0.87)	2.63 (0.88)	0.21*	0.25
Extrinsic Motivation	3.64 (0.83)	3.53 (0.93)	-0.11	-0.13	3.40 (0.94)	3.41 (1.00)	0.01	0.01
Intrinsic Motivation	3.54 (0.92)	3.68 (0.86)	0.14	0.15	3.51 (0.82)	3.58 (0.95)	0.07	0.09
Vocabulary Test	15.80 (2.91)	18.42 (3.86)	2.62*	0.90	15.41 (2.99)	16.10 (2.96)	0.69	0.23

Note. Gain is the mean difference (posttest minus pretest). \* $p < .05$  with the Bonferroni adjustment. Interpretation of effect size delta ( $\Delta$ ):  $|\Delta| \leq 0.20$  = small,  $0.20 < |\Delta| \leq 0.50$  = medium,  $|\Delta| > 0.50$  = large (according to Koizumi & Katagiri, 2007)

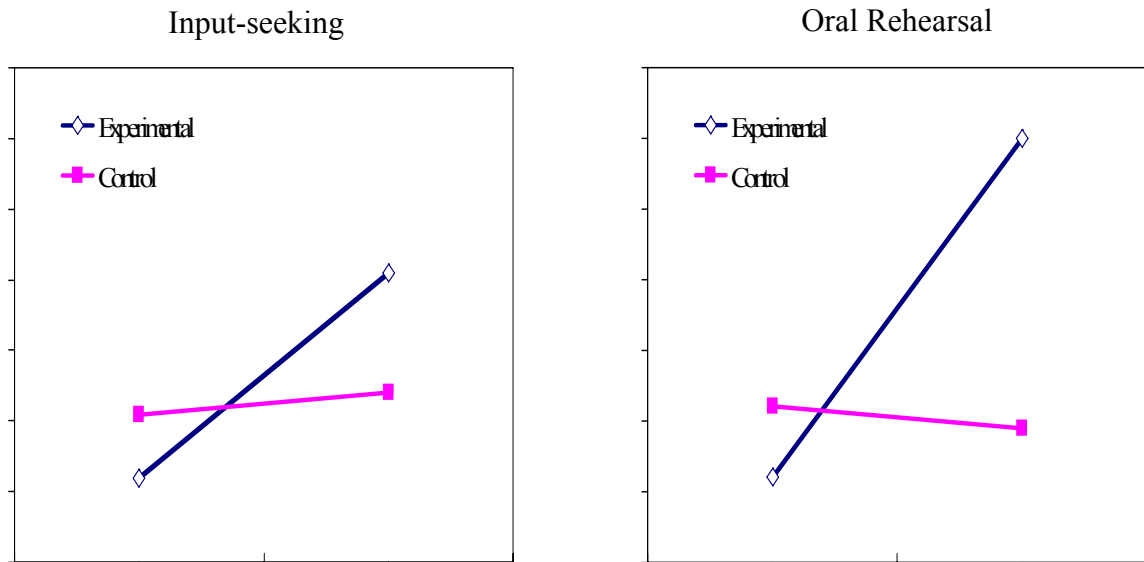


Figure 6.2. Visual representation of the interaction effects of the two dependent variables.

### 6.3.2 Research Question 2

*Are there any differences within the experimental group that are based on the learners' initial repertoire of VLS?*

In order to answer this question, we compared the mean scores of the pretest and posttest among the clusters, with the Bonferroni adjustment ( $p < .05$ ). It should be noted that the number of participants in Cluster 2 ( $n = 14$ ) was rather small; therefore, there was a possibility that it would violate the assumption of parametric tests. For this reason, a non-parametric test, i.e., the Wilcoxon signed-rank test, was conducted to double-check the results. This procedure yielded the same results.

Figure 6.3 and Table 6.5 present the results of this analysis. Of the three clusters, the learners in Cluster 1 demonstrated the greatest improvement. In particular, they significantly gained in Input-seeking ( $M_{\text{diff}} = 0.63$ ), Oral Rehearsal ( $M_{\text{diff}} = 0.70$ ), Association ( $M_{\text{diff}} = 0.52$ ), and Intrinsic Motivation ( $M_{\text{diff}} = 0.35$ ). The same tendency was observed for the learners in Cluster 3 (Oral Rehearsal:  $M_{\text{diff}} = 0.36$ ; Association:  $M_{\text{diff}} = 0.31$ ). An interesting difference between Clusters 1 and 3 was the difference in their Intrinsic Motivation scores. Specifically, Intrinsic Motivation increased for the learners in Cluster 1 but not for the learners in Cluster 3. The fact that Intrinsic Motivation was enhanced for the learners in Cluster 1 might suggest a possibility that their motivation increased due to the instruction of VLS. This result is in line with previous studies that reported that strategy instruction improves learners' motivation (e.g., Nunan, 1997).

In general, the gains that Cluster 1 exhibited are in line with the findings obtained from the comparison between the experimental and control groups, that is, the experimental group demonstrated greater increases in the use of the input-seeking and oral rehearsal strategies. In contrast, the scores for Cluster 2 did not exhibit any increase in any of the variables, with the exception of the vocabulary test ( $M_{\text{diff}} = 3.64$ ). Interestingly, this group of

learners marked the largest gains with respect to the vocabulary test.

In sum, the results suggest that the learners who were less frequent strategy users (Cluster 1) and moderate strategy users (Cluster 3) benefited the most from the VLS instruction, whereas the active strategy users (Cluster 2) did not show any gains in terms of VLS use and motivation. The following are noteworthy findings that require further investigation: (a) the improvements of the learners in Clusters 1 and 3 in their use of input-seeking, oral rehearsal, or association strategies, (b) the absence of an increase in the use of other strategies by the same learners, (c) the increase in Intrinsic Motivation of the learners in Cluster 1 before and after the intervention and (d) the reason for the absence of an increase in the use of VLS by the learners in Cluster 2. These questions are discussed further in the following section along with the results of the qualitative analyses of the study logs and interview sessions.



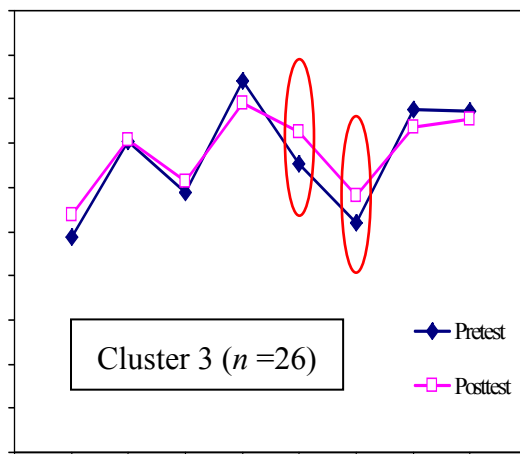
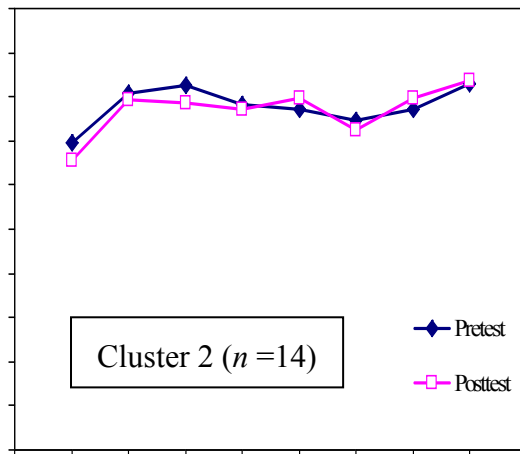
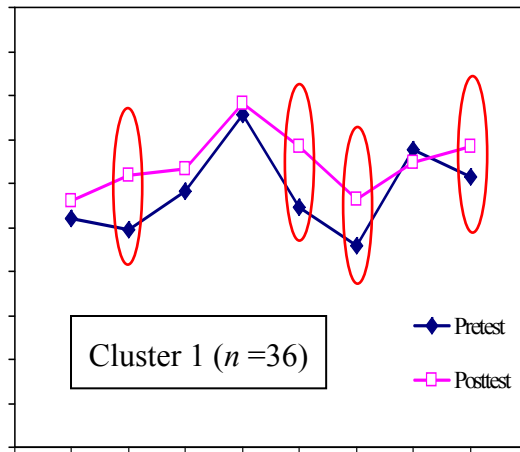


Figure 6.3. Visual representation of each cluster. The circles in the figure demonstrate that the difference is significant at  $p < .05$ . Refer to Table 6.5 for each variable.

Table 6.5

Scores, Standard Deviations, and Gains in Each Cluster before and After the Intervention

Variables	Cluster 1 ( $n = 36$ )			Cluster 2 ( $n = 14$ )			Cluster 3 ( $n = 26$ )					
	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain			
	$M(SD)$	$M(SD)$	$d$	$M(SD)$	$M(SD)$	$d$	$M(SD)$	$M(SD)$	$d$			
1. Self-management	2.59 (0.63)	2.80 (0.79)	0.21	0.33	3.48 (0.82)	3.29 (0.99)	-0.19	-0.23	2.43 (0.58)	2.68 (0.60)	0.25	0.43
2. Input-seeking	2.47 (0.74)	3.10 (0.91)	0.63*	0.85	4.04 (0.61)	3.96 (0.75)	-0.07	-0.13	3.53 (0.77)	3.54 (0.77)	0.01	0.01
3. Imagery	2.91 (0.73)	3.16 (0.94)	0.26	0.34	4.13 (0.64)	3.92 (0.80)	-0.21	-0.33	2.94 (0.54)	3.06 (0.84)	0.12	0.22
4. Writing Rehearsal	3.78 (0.79)	3.91 (1.01)	0.13	0.16	3.91 (1.06)	3.86 (0.98)	-0.05	-0.05	4.21 (0.78)	3.95 (1.01)	-0.26	-0.33
5. Oral Rehearsal	2.72 (0.85)	3.43 (0.90)	0.70*	0.84	3.86 (1.04)	3.98 (0.79)	0.12	0.12	3.27 (0.78)	3.63 (0.92)	0.36*	0.46
6. Association	2.30 (0.78)	2.81 (0.95)	0.52*	0.65	3.74 (0.72)	3.62 (1.06)	-0.12	-0.17	2.60 (0.57)	2.91 (0.73)	0.31*	0.54
7. Extrinsic Motivation	3.38 (0.77)	3.24 (0.92)	-0.14	-0.18	3.86 (0.79)	3.98 (0.76)	0.12	0.15	3.88 (0.86)	3.68 (0.92)	-0.2	-0.23
8. Intrinsic Motivation	3.08 (0.77)	3.43 (0.77)	0.35*	0.45	4.14 (0.63)	4.18 (0.73)	0.03	0.06	3.86 (0.93)	3.77 (0.94)	-0.09	-0.10
Vocabulary Test	14.42 (2.16)	17.22 (3.38)	2.81*	1.30	16.43 (3.78)	20.07 (4.21)	3.64*	0.96	17.38 (2.43)	19.19 (3.89)	1.81*	0.74

Note. \* $p < .05$  with the Bonferroni adjustment. Interpretation of effect size delta ( $d$ ):  $|.20| \leq \text{small} < |.50|$ ,  $|.50| < \text{medium} < |.80|$ ,  $|.80| \leq \text{large}$

### 6.3.3 Research Question 3

*What are the reasons behind these differences?*

An examination of the study logs and interviews of the learners in Clusters 1 (less frequent strategy users) and 3 (moderate strategy users) revealed two reasons for the increased use of input-seeking, oral rehearsal, or association strategies. The qualitative analysis demonstrated that they “realized the effectiveness of the existing repertoire of strategies” and were “trying the strategies that they thought are useful for them.”

Through strategy instruction, the learners became more aware of the effectiveness of the strategies they were already using. One learner provided the following comment at the interview (all the following excerpts are translated by the author):

[Excerpt 1: T3NY]

*When I memorize words, I always read them aloud as I write them. I have been using this way of learning since I was a junior high school student. Even when other people tell me about other strategies, somehow I always keep using this one. I think this suits my learning style. After the instruction, I once again realized the effectiveness of vocalizing the words.*

Most of the other interviewees made similar comments. The idea that the VLS instruction increased awareness toward the strategies that the learners were already using may also hold true with respect to input-seeking strategies. In fact, many learners expressed this view, as seen in the following excerpt:

[Excerpt 2: T4NR]

*During the course period, I tried to expose myself to the English language as much as possible because this was emphasized during the instruction. I watched English TV programs and movies on DVDs with English subtitles again and again.*

Simultaneously, the learners also gained awareness of the usefulness of the strategies that they had NOT been using before the strategy instruction. They understood the usefulness and importance of the strategies that they were taught and attempted to employ them. This was particularly effective with respect to association strategies. The following is a remark that was echoed in many other study log entries:

[Excerpt 3: T2SY]

*I had never used strategies such as associating the target words with familiar synonyms or antonyms, using prefixes and suffixes, and grouping semantically-related words before. I used to try to remember the meaning of a word through one-to-one correspondence, namely, between the English and Japanese words, by just repeatedly writing them on a piece of paper. After I learned the newly introduced strategies, I was able to feel that there are several ways to make the process of vocabulary learning easier.*

While the VLS instruction increased the use of the strategies described above, the same is not true for the other strategies. The reason for this is that either the learners were already using them (writing rehearsal strategies) or that some of the strategies were difficult for them to use even though they seemed useful when they were taught (imagery strategies). Most of the learners stated in the interview sessions and also wrote in the study logs that they had encountered difficulties while attempting to put imagery strategies such as the keyword method into practice. Initially, they had held the impression that imagery strategies were promising for facilitating their vocabulary learning. However, they subsequently realized that it would not be worth the effort considering the amount of time required to use them. This cost-effectiveness trade-off was echoed in the interviews and study logs as

follows:

[Excerpt 4: T3MS]

*I cannot think of a mental image or mnemonics for the target vocabulary. I'm bad at making them by myself. Also, imagery or mnemonics are not suitable for all the words. I'd rather spend my time on writing or vocalizing the target words.*

The reasons for the increase in intrinsic motivation for the learners in Cluster 1 may not be easily explained because a language course involves numerous variables. With this limitation in mind, we provide the following comments made by two learners in Cluster 1:

[Excerpt 5: W2OS]

*Since I felt I was able to remember vocabulary more easily with all the strategies taught, now I feel I can be better at learning English. The teachers should have taught them to me when I first started learning English in junior high school.*

[Excerpt 6: W3IK]

*At the moment, I'm not studying English so seriously, but now that I've learned effective ways, I think I can learn more vocabulary when it becomes necessary. If I can learn vocabulary more easily, I might begin to like English as a result.*

These comments suggest that the instruction of VLS more or less contributed to the increase in intrinsic motivation. However, this increase was observed only for the learners in Cluster 1, namely, the less frequent strategy users. From this phenomenon stems the following rationale for incorporating VLS instruction in regular classroom teaching: Strategy instruction may have not only improved the use of some strategies but also enhanced the

learners' motivation (Cohen & Dörnyei, 2002; Nunan, 1997).

The learners in Cluster 2 (active strategy users) did not exhibit any increase in their VLS use. The analyses of the study logs and interview sessions revealed that these learners seemed to have already established their own methods for learning vocabulary, and thus, the instruction did not bring about any changes. To some extent, their use of VLS may have already reached saturation point before the intervention studies were conducted. This phenomenon was reflected in one interviewee's comment as follows:

[Excerpt 7: T4TS]

*I felt surprise at each lesson because the strategies introduced were the ones I had already been using. In fact, it was reassuring to see the strategies being introduced as "effective" approaches to learning vocabulary. Sometimes I felt that I was not using some of the strategies very efficiently, so it was a good opportunity to review them.*

When the learners in Cluster 2 examined their actual use of strategies at the time of the interviews, they generally reported more frequent use of strategies than did the learners in Clusters 1 and 3. This active use of VLS may account for the former exhibiting the largest increase in their vocabulary test scores. In this regard, strategy instruction was useful for directing them in using the VLS more effectively. Furthermore, in general, their reaction to the strategy instruction was positive. Accordingly, it can be suggested that strategy instruction is as useful for such learners as it is for those whose scores did not change after the intervention studies. In fact, this can be the answer to the main concern about allocating class time for strategy instruction, which is best summarized by Dörnyei (2005) as follows: "It is not clear whether the benefits of their explicit employment warrant the time and effort spent on them in comparison to spending the same amount of creative energy designing 'ordinary' learning activities" (p. 176).

#### **6.4 Summary of Study 4**

In this study, we explored the effectiveness of explicit instruction of VLS with Japanese EFL learners. From the results, it may well be concluded that the current study demonstrates the effectiveness of explicit VLS instruction in combination with regular classroom instruction. Comparisons between the experimental and control groups revealed that the learners in the former exhibited better vocabulary learning and used the input-seeking and oral rehearsal strategies more frequently. Within the experimental group, less frequent and modest strategy users marked gains in their use of strategies; however, the active strategy users in the beginning did not show any increase. The follow-up qualitative analyses revealed that (a) VLS instruction could increase awareness toward the use of strategies for all types of learners, (b) the difficulties encountered while attempting to use certain strategies prevented the learners from employing such strategies after they were taught, (c) even though some learners did not exhibit any changes before and after the treatment, the instruction helped them realize the importance of using VLS strategies, and (d) most of the learners provided positive feedback to the instruction. An interesting byproduct of the strategy instruction was that the intrinsic motivation of the less frequent strategy users might have been enhanced by the strategy instruction. These results corroborate the past findings related to strategy instruction, which reported that it led to greater strategy use, higher self-efficacy, increased motivation, wider strategy knowledge, and more positive attitudes (Chamot, Barnhardt, El-Dinary, & Robbins, 1996; Nunan, 1997). Moreover, the current study proves that strategy instruction is more beneficial to less effective learners (Wenden, 1986). On these grounds, it can be argued that the instruction of VLS should be further employed and expanded in the normal classroom settings.

## Notes

- 1 The number of participants from whom TOEIC scores were obtained was smaller than the actual number of the participants in the study ( $N = 146$ ). This is because we only took into consideration the scores of those who had taken this test in the last one-year period.
- 2 For a detailed description of the fit index, see Tseng, Dörnyei, and Schmitt (2006).
- 3 The superiority of this model over other models in the Japanese educational setting is discussed by the JACET Learning Strategy Special Interest Group (2005).



## **Chapter 7: Conclusion and Implications**

In this chapter, the limitations of the four studies reported in this dissertation will be discussed first. Next will come the summary of major findings in this dissertation, and the pedagogical implications of these findings will be also addressed. Finally, suggestions for future research will be made to expand and broaden the scope of VLS research area.

### **7.1 Limitations of the Four Empirical Studies**

With regard to the results of the studies in this dissertation, a few limitations should be taken into consideration. First, all four studies were conducted in a relatively short period of time, and the intervention study (Study 4) spanned one semester (four months). A longitudinal study, therefore, could have provided a more comprehensive overview of VLS use.

Second, the proficiency levels of the participants were rather homogeneous (mostly average or lower-level EFL learners in Japan). Since proficiency has been reported to influence the choice and use of strategies, the results of this study might have been slightly different had we included more proficient learners in the research design.

Third, although we incorporated in-depth qualitative analyses, the results and implications obtained from a series of studies were mostly based on self-reported questionnaires. We therefore might not have completely captured how well the learners actually employ strategies. As with Gu's excellent example (2003a), focusing on a very small number of learners may have revealed their actual step-by-step choices and deployment of VLS.

Last but definitely not least, the scope of VLS covered in the studies was limited. That is, the questionnaire developed in Study 2 and used in the subsequent studies (Studies 3 and 4) focused only on cognitive and metacognitive aspects of VLS (mainly consolidation

strategies), and guessing or dictionary strategies were not included. If we view VLS as processes covering all stages of vocabulary acquisition, paying attention to wider aspects of vocabulary learning processes would be necessary. This problem boils down to the definition and construct validity of VLS, which applies to not only VLS research but also to studies on general language learning strategies. Clearly, theoretical clarification of what VLS means will be needed in order to utilize VLS research findings for better teaching and learning.

With these limitations in mind, the major research findings and their pedagogical implications will be discussed in the following section.

## **7.2 Major Findings and Implications**

In the first chapter of this dissertation, I outlined five general research questions for this dissertation, and this section will summarize major findings and pedagogical implications obtained from the four empirical studies according to those research questions.

### *1. How do Japanese EFL university learners actually approach vocabulary learning by using vocabulary learning strategies?*

The findings from all the four studies indicate that Japanese EFL university learners use repetition strategies more frequently than they do imagery and association strategies among cognitive and memory strategies as the VLS literature suggests (Fan, 2003; Gu & Johnson, 1996; Lawson & Hogben, 1995; Schmitt, 1997). Among the types of repetition strategies, writing rehearsal is so predominant that they may no longer constitute VLS (in Study 2), while oral rehearsal is used infrequently compared with writing rehearsal. In addition, most average-proficiency learners do not actively employ metacognitive strategies (in all four studies).

Since the literature has reported the VLS that were found to be used less frequently by Japanese EFL university learners (i.e., oral rehearsal, imagery, association, and metacognitive strategies) may contribute to the development of overall proficiency in English, VLS instruction will be absolutely necessary for improving awareness of VLS. As Study 1 shows, there is a gap between learners' actual VLS use and the strategies' perceived usefulness. Schmitt (1997) argues that the discrepancies between the use and perceived usefulness of VLS imply that "learners may be willing to try new strategies if they are introduced to and instructed in them" (p. 221). Study 4 provided evidence in support of this claim, with learners who use VLS less frequently showing more improvement in VLS use and in the scores of vocabulary test.

When introducing VLS to our students, we must keep in mind that both cognitive strategies and metacognitive strategies should be instructed. Teaching a variety of cognitive strategies will be useful for providing learners with options to select in employing VLS. As a result, learners may be able to coordinate cognitive VLS, which might be otherwise not accessible. Teaching cognitive strategies will benefit less proficient learners who do not know how to actually deal with and remember new vocabulary. As Nation (2001) points out, however, cognitive strategy or memorization is "only useful if it is one of a wide range of actively used strategies. It should not be the major means of learning" (p. 227). In fact, the results of Study 1 and those of Gu and Johnson (1996) signify that VLS that aim for only retaining words do not lead to the development of general English proficiency and vocabulary size. Also, the VLS literature overwhelmingly supports the view that successful learners employ a wider variety of VLS in orchestrated/coordinated manners than less successful counterparts do, and they take a "structured approach" to vocabulary learning.

For these reasons, materials and classroom VLS instruction that are well balanced to direct learners' attention to appropriate cognitive and metacognitive strategies will be most desirable. By integrating structured approach for vocabulary learning in VLS instruction and

handing over the responsibility to the learners, we may be able to help out students foster the sense of self-regulation and learner autonomy (Rubin, Chamot, Harris, & Anderson, 2007; Wenden, 1991).

*2. Is it possible to create a psychometrically valid scale of vocabulary learning strategies, which truly reflect the construct with which it intends to measure?*

The results of Study 2 suggest it is possible to construct a psychometrically valid scale for measuring the use of VLS by Japanese EFL university learners. Subsequent studies (Studies 3 and 4) showed that the instrument could be used as a valid and reliable measure of VLS. Study 2 was conducted mainly because lack of theoretical rigor is the major source of criticism of language learning strategies research (Macaro, 2006). Thus, it was necessary to clarify what we intended to measure with the instrument. As mentioned in 7.1, the scale focused on consolidation strategies (cognitive and metacognitive strategies) of VLS. The construct it intended to measure was successfully operationalized, and validity was confirmed.

Using the newly developed scale, Studies 3 and 4 produced findings that would contribute to better understandings of VLS. Those findings are all the more convincing, because the construct validity of the instrument has been established. This is a step that other VLS studies have rarely undertaken.

Dörnyei (2005) claims that questionnaires used in language learning strategies have failed to combine practical and psychometric considerations; consequently, we are not sure if they can be used as a classroom tool or a research instrument. Nonetheless, from the results of Studies 2, 3, and 4, it can be argued that continuing our endeavors is warranted at least in the case of the targeted proficiency of learners.

3. *What kind of factors influences the choice and use of vocabulary learning strategies?*

Throughout the four studies, proficiency was observed to have an effect on the use of VLS to some degree. This is in line with the view in the literature that those who use VLS more frequently and consciously achieve higher levels of proficiency. The effect of proficiency on VLS is more manifest in metacognitive strategies than in cognitive strategies (in Studies 1, 2, and 3) That in turn means training metacognitive strategies is necessary in VLS instruction because it may lead to more effective vocabulary learning.

Among the factors possibly influencing the choice and use of VLS reported in the VLS literature (see 2.2.4), most of the variables (e.g., age, sex, learning environments, and culture) were controlled because all of the participants in the four studies were Japanese EFL university students (for Studies 1 and 4, only female learners). The focus was on motivation (Studies 3 and 4), an underresearched area in VLS studies. In Study 3, it was found that intrinsic motivation had a greater influence on the use of VLS than extrinsic motivation (Figure 5.1). Furthermore, while the direct influences (path coefficients) of intrinsic or extrinsic motivation on proficiency were not strong (not statistically significant), VLS in combination with intrinsic motivation had a greater influence on proficiency. These results indicate that intrinsically motivating learners in VLS instruction is crucial to facilitate the use of VLS and improve our students' proficiency. We could employ a number of motivational strategies in the classroom (Dörnyei, 2001) to motivate our students. For instance, using relevant and interesting materials would be one way to make learners motivated from VLS instruction (Nyikos & Fan, 2007).

Results of Study 1 showed there is a discrepancy between VLS learners actually use and the strategies' perceived usefulness. These results also represent beliefs about VLS that

may stem from perceived usefulness, cost, and preferences for VLS use play an important role in the choice and use of VLS. VLS instruction should be integrated in classroom teaching to raise awareness of VLS and bridge the gap between the actual use and the perceived usefulness.

*4. Does the instruction of vocabulary learning strategies change the learners' strategy use, and if so, in what kind of strategies can we observe the changes?*

Study 4 reported the following findings about the effectiveness of VLS instruction with Japanese EFL university students:

1. Explicit teaching of VLSs results in improved vocabulary test scores.
2. Explicit teaching of VLSs results in increases of strategy use among learners with lower and moderate levels of such use.
3. Explicit teaching of VLSs may result in little change among learners with high levels of use; however, their teaching can confirm already held beliefs about their effectiveness.
4. Some VLSs are quickly rejected due to their time-consuming nature or being perceived as inefficient in other ways.
5. Explicit teaching of VLSs may result in more intrinsically motivated learners.

Overall, it has been confirmed from Study 4 and the VLS literature (Nyikos & Fan, 2007) that classes teaching VLS will result in better learning outcomes than classes without VLS instruction. Pedagogically, it can be suggested that teachers should know the types of VLS learners currently use and provide appropriate scaffolding with explicit VLS instruction to direct learners' attention to more elaborate VLS which they do not know or

use (e.g., oral rehearsal is more effective than visual repetition).

Now that the effectiveness of VLS instruction has been demonstrated, teachers who plan to implement VLS instruction have to consider maximizing the teaching and learning of VLS in the normal classroom settings. For example, VLS instruction does not always bring about the increase of VLS use because some VLSs are quickly rejected due to their time-consuming nature. In the case of Study 4, learners did not start using imagery strategies, such as the keyword method. Also, it was found that the use of self-management strategies did not change before and after instruction. Considering the significance of metacognitive strategies in VLS, we will need to consider how to make changes happen in this aspect. Together, these results show that just introducing and teaching some VLS explicitly in the class will not be enough for learners to start using those VLS. Nation (2001) argues that “it is certainly not sufficient to demonstrate and explain a strategy to learners and then leave the rest to them” (p. 223). Teachers and learners alike, therefore, need to spend a considerable amount of time and effort to benefit from VLS instruction.

Possible solutions to these problems may be: (a) developing materials which include abundant practice of VLS so that learners can get as many opportunities to review VLS as possible, and (b) incorporating review and practice activities by instructing note-taking strategies. As for materials development, we have seen several excellent textbooks which include VLS training (e.g., Ellis & Sinclair, 1989; McCarthy & O’Dell, 1993). More recently, VLS training in the textbooks has been integrated into other skills development such as writing and reading (Huntley, 2006; Schmitt & Schmitt, 2005). This is a welcome move because we should not see vocabulary learning as discrete but integrated into discourse (Nation, 2001; Gu, 2005). Since preparing appropriate materials for VLS instruction takes time and experience, teachers can choose those textbooks when conducting VLS instruction in the classroom setting.

Implementing vocabulary notebooks or vocabulary cards would be another way to

direct learners' attention to VLS after new they are introduced to new VLS. The skillful implementation of note-taking strategies has all the components necessary for successful vocabulary learning: structured approach (using metacognitive strategies), spaced repetition (recall), elaborate processing, and conscious learning (Schmitt & Schmitt, 1995). Thus, if we can include note-taking strategies in addition to VLS instruction in the classroom, we may be able to draw more learners' attention to VLS use. At the same time, however, learners should not be forced to use note-taking strategies, because after all it is learners who choose and employ VLS, not the teacher.

Gu (2003b) has proposed that we consider person, task, and context in discussing VLS use, and this also holds true for VLS instruction. As such, we need to understand our students' VLS use well and "gain (the) cooperation of the learners" (Schmitt, 2000, p. 133) when conducting VLS instruction in the classroom.

### **7.3 Suggestions for Future Research**

Suggestions for future research will be made here in order to expand and broaden the scope of VLS research. The suggestions involve: (a) developing a better VLS instruction methodology; (b) considering individual differences further; and (c) establishing a rigorous theoretical framework.

First, future research projects should be directed at improving the quality of teaching methodologies for VLS. In particular, now that the research on learning strategies has become matured (Cohen & Macaro, 2007), we are better equipped with theoretical and empirical research findings that can help us construct concrete examples of better strategy instruction. A good example of this is the Styles and Strategies-Based Instruction (SSBI) developed by Cohen & Weaver (2005). Furthermore, strategies that do not change their use before and after VLS instruction (Study 4) could be activated using task-induced VLS instruction (Wesche & Paribakht, 2000). If we can determine which types of VLS



instruction (explicit classroom teaching or task-induced instruction) can elicit different types of VLS at different levels of the learners, more concrete and detailed VLS teaching plan could be created.

Secondly, for VLS instruction to be more efficient and effective, we should consider individual differences thoroughly. The good use of learning strategies can be characterized as “individualized” and tailored to the needs of each learner. This is because many factors are involved in the deployment of learning strategies, such as purpose of learning, proficiency, and motivation. In addition, there are several more individual differences, and their effects on VLS have not been investigated in the literature such as learning aptitude, personality type, anxiety, willingness to communicate, and so forth (Dörnyei, 2005; Robinson, 2002; Skehan, 1989; Yashima, 2002). Teaching VLS to dozens of students in the normal classroom (especially, in Japan where the class size of EFL teaching is still notoriously large) is in a way analogous to a doctor diagnosing dozens of patients at one time. These situations may lead to misdiagnoses. The most appropriate teaching of VLS would entail a one-on-one conversations with the learners and an appreciation of individual differences. Thus, providing learning support such as language counseling (Rubin, 2007) may be a very promising area of VLS instruction.

Finally, the research field needs to establish a rigorous theoretical framework for VLS, and, of course, for language learning strategies research in general. As repeatedly pointed out in this dissertation, a lack of theoretical rigor is the major drawback to this area of research. At the moment, the definition of language learning strategies (and also VLS) is still ambiguous, and what we mean by learning strategy differs from researcher to researcher. After 30 years of research and practice, we are no longer a nascent research field (Cohen & Macaro, 2007). In order to prove that the VLS research and all the research areas related to language learning are worth study, and research findings are helpful for our students, as Macaro (2006) proposes, all theoretical uncertainty must be resolved.

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## Appendices

### Appendix A Vocabulary Learning Questionnaire Used in Study 1

(Revision of “Vocabulary Learning Questionnaire Version 3,” Gu & Johnson, 1996)

#### Part A Beliefs about vocabulary learning

1. 日本語の単語に相当するすべての英単語を覚えることによって、英語は身につけることが可能だ。

(Once the English equivalents of all Chinese words have been remembered, English is learned.)

2. 単語を覚える一番の方法はリストや辞書を覚えることだ。

(The best way to remember words is to memorize word lists or dictionaries.)

3. 単語は意味を覚えることだけが目的である。

(Remembering the meanings of a word is an end in itself.)

4. 単語は辞書にある一つの定義を覚えることだけが必要である。

(It is only necessary to remember one dictionary definition.)

5. たくさんの数の単語の意味がリーディングを通して学習できる。

(The meanings of a considerable amount of words can be picked up through reading.)

6. 語彙力はたくさん読むことで増やすことができる。

(One can expand his vocabulary simply through reading a lot.)

7. 文脈から単語の意味を推測する方法は、単語の学習において一番の方法である。

(Guessing words in context is one of the best ways to learn vocabulary.)

8. 単語だけでなく、その単語とセットのフレーズ（成句）や一緒に使われる語（コロケーション）にも注意を払うべきである。

(One should pay attention to set phrases and collocations that go with a word.)

9. 学習した単語を本当に身につけるためには、実際に使ってみるべきである。

(Words studied should be put to use before they are finally learned.)

10. 言語を実際に（リスニング、スピーキング、リーディング、ライティングなどで）使う方が単語を覚えるよりも重要である。

(Using the language (listening, speaking, reading, and writing) is more important than memorizing words.)

11. 単語は使ってみてはじめてマスターできる。

(Words are learned after you use them.)

### **Part B Metacognitive regulation**

1. どの単語が自分にとって重要で学ぶべきかを知っている。

(I know which words are important for me to learn.)

2. どういう単語が推測できて、どれができないかを大体わかる。

(I have a sense of which word I can guess and which word I can't.)

3. 新出単語やフレーズを見たときには、それが覚えなければならないものかどうかはっきりとわかる。

(When I meet a new word or phrase, I have a clear sense of whether I need to remember it.)

4. 興味がある単語は調べてみる。

(I look up words that I'm interested in.)

5. 大事な単語は書きとめておく。

(I make a note of words that seem important to me.)

6. 教科書のほかに自分の興味のある読み物を探す。

(Besides textbooks, I look for other readings that fall under my interest.)

7. あまり確実に覚えていない単語の意味を確認するために、さまざまな方法を使う。

(I use various means to make clear vocabulary items that I am not quite clear of.)

8. 先生が覚えなさいと言わない単語は覚えようとしない。（逆転項目）

(I wouldn't learn what my English teacher doesn't tell us to learn. [Reversed value])

9. 試験に直接関係のあるものしか集中して覚えない。(逆転項目)

(I only focus on things that are directly related to examinations. [Reversed value])

10. 先生が授業で説明しない単語はあまり注意しない。(逆転項目)

(I wouldn't care much about vocabulary items that my teacher does not explain in class.  
[Reversed value])

### Part C Guessing strategies

1. 単語の意味が推測できなければ、別の手がかりをもとに意味を考えてみる。

(I use alternative cues and try again if I fail to guess the meaning of a word.)

2. 単語の意味を推測するときは、一般常識と背景知識を活用する。

(I make use of my common sense and knowledge of the world when guessing the meaning of a word.)

3. 自分の推測した単語の意味があっているか、より幅広い文脈に照らし合わせて確認する。

(I check my guessed meaning against the wider context to see if it fits in.)

4. 単語の意味を推測するときには、そのトピック（話の内容）の知識を利用する。

(I make use of my knowledge of the topic when guessing the meaning of a word.)

5. 新出の単語の意味を推測するときは、その単語が使われている文の文法構造を利用する。

(I make use of the grammatical structure of a sentence when guessing the meaning of a new word.)

6. 新出の単語の意味を推測するときは、品詞を利用する。

(I make use of the part of speech of a new word when guessing its meaning.)

7. 単語の意味を推測するときには語の構成要素（\*接頭語、\*語幹、\*接尾語）を分析する。

(I analyze the word structure (prefix, root, and suffix) when guessing the meaning of a word.)

※**接頭語**＝単語の前について意味を変えるもの。"unhappy" の "un" の部分は「～でない」という意味なので「不幸な」という意味であるとわかる。

※**接尾語**＝単語の最後の部分について意味を変えるもの。"changeable" の最後の "able" の部分は「～できる」という意味なので、「変わりやすい」という意味であるとわかる。

※**語幹**＝接頭語や接尾語がついても変化しない部分。例えば、produce という単語は production や productive、producer などの接尾語がついても元となっている形である。

## Part D Dictionary strategies

1. 見覚えのない単語で、同じものを何度も見たら辞書で調べる。

(When I see an unfamiliar word again and again, I look it up.)

2. 単語の意味の推測が正しいかどうかをチェックしたいときには、辞書で調べる。

(When I want to confirm my guess about a word, I look it up.)

3. 単語を知らないことでその文全体を理解できないときや、段落全体を理解できないときには辞書を調べる。

(When not knowing a word prevents me from understanding a whole sentence or even a whole paragraph, I look it up.)

4. その単語が使われている文や段落で、その語が文や段落の理解のために大事な場合には、辞書で調べる。

(I look up words that are crucial to the understanding of the sentence or paragraph in which it appears.)

5. 単語を辞書で調べるときには、用例（実際にどのように使われるか）に注意を払う。

(I pay attention to the examples of use when I look up a word in a dictionary.)

6. 辞書を引くときは、調べている単語と一緒に使われているフレーズや決まった言

い方を探す。

(I look for phrases or set expressions that go with the word I look up.)

7. 辞書で単語の意味を調べるときは、その語の様々な意味を表している例文をいくつか読む。

(When looking up a word in the dictionary, I read sample sentences illustrating various meanings of the word.)

8. もし調べている単語が語形変化していたら、変化している部分を除外して単語を調べる（例：created という語なら、create で調べる）。

(If the new word is inflected, I remove the inflections to recover the form to look up (e.g., for created, look for create)).

9. もし調べている単語に\*接頭語か\*接尾語がついているようであれば、それらをはずした\*語幹の形で調べてみる。（\*Part C 7 参照）

(If the new word I try to look up seems to have a prefix or suffix, I will try the entry for the stem.)

10. もし調べている単語が不規則変化の形であったり、スペルの変異形（アメリカ英語では labor がイギリス英語では labour など）であれば、近くにある見出し語の項目を探してみる。

(If the unknown appears to be an irregularly inflected form or a spelling variant, I will scan nearby entries.)

11. たくさん意味があつたり、同形異義語（同じスペルだが異なる意味を持つ語）があれば、様々な情報（例：品詞、発音、会話の形なのか文章の形なのか、一緒に使われる語、意味、など）を利用して、消去法で自分に必要な意味を限定していく。

(If there are multiple senses or homographic entries, I use various information (e.g., part of speech, pronunciation, style, collocation, meaning, etc.) to reduce them by elimination.)

12. 辞書の定義を文脈に組み込んでみて、一緒に使われている語や品詞、意味の広がりなどに合わせて考えてみて、その文脈の中での意味を見分ける。

(I try to integrate dictionary definitions into the context where the unknown was met and arrive at a contextual meaning by adjusting for complementation and collocation, part of speech, and breadth of meaning.)

### Part E Note-taking strategies

1. 調べている単語が、良く使われるものであれば、その語の意味を書いておく。

(I make a note of the meaning of a new word when I think the word I'm looking up is commonly used.)

2. 調べている単語が、自分の個人的興味に関連のあるものであれば書いておく。

(I make a note when I think the word I'm looking up is relevant to my personal interest.)

3. ノートに同義語や反意語を書いておく。

(I put synonyms or antonyms together in my notebook.)

4. 辞書で調べたときに、その単語の辞書の記述や、英語の同義語を書いておく。

(I write down the English synonym(s) or explanations of the word I look up.)

5. 調べている単語の日本語訳と英語の同義語を書いておく。

(I write down both the Japanese\* equivalent and the English synonyms of the word I look up. [\*originally "Chinese"])

6. 役に立つ表現やフレーズを見たときにはメモしておく。

(I make a note when I see a useful expression or phrase.)

7. 辞書で調べた語のコロケーション（一緒に使われる語）を書いておく。

(I take down the collocations of the word I look up.)

8. 調べた語の文法的な情報を書いておく。

(I take down grammatical information about a word when I look it up.)

9. 調べた語の使い方がわかる例文を書いておく。

(I note down examples showing the usages of the word I look up.)

## **Part F Memory strategies: Rehearsal**

1. 新出単語のリストを作っている。

(I make vocabulary lists of new words that I meet.)

2. 新出単語をカードの一方に書いて、その単語の説明を反対に書いている。

(I write the new words on one side of a card and their explanations on the other side.)

3. 自分が作った単語のリストを手元に持っている。

(I keep the vocabulary lists of new words that I make.)

4. 何回もリストを見直して、知らない単語がないと確信が持てるまで繰り返す。

(I go through my vocabulary list several times until I am sure that I do not have any words on that list that I still don't understand.)

5. 単語カードを作って、どこへ行くときも持っている。

(I make vocabulary cards and take them with me wherever I go.)

6. 新しく暗記した単語を、定期的にスケジュールを決めて見直している。

(I make regular and structured reviews of new words I have memorized.)

7. 単語を覚えようとするときには、声に出して何度も言う。

(When I try to remember a word, I repeat it aloud to myself.)

8. 新しい単語は自分で音読すれば、その単語を覚えるのに十分である。

(Repeating the sound of a new word to myself would be enough for me to remember the word.)

9. 単語を覚えようとするときはその単語を何回も書く。

(When I try to remember a word, I write it repeatedly.)

10. 単語のスペルを一文字ずつ覚える (例: letter なら l, e, t, t, e, r)。

(I memorize the spelling of a word letter by letter.)

11. 新出単語とその日本語訳の両方を、覚えるために何度も書く。

(I write both the-new words and their Japanese\* equivalents repeatedly in order to remember them. [\*originally “Chinese”])

### **Part G Memory strategies: Encoding**

1. スペルのある部分が似ていたり、同じような音が単語の中にある、すでに知っている語といくつかの単語を連想させて覚える。(例： require と acquire、deserve と reserve など)

(I remember a group of new words that share a similar part in spelling.)

2. 音の似ている単語をまとめて覚える。

(I remember together words that sound similar.)

3. 同じようなスペルの単語をまとめて覚える。

(I remember together words that are spelled similarly.)

4. すでに知っている単語で、新出単語と同じような音が入っているものを関連させて覚える。

(I associate a group of new words that share a similar part in spelling with a known word that looks or sounds similar to the shared part.)

5. 新しく単語に出会ったら、記憶しているものの中から同義語や反意語があるかどうか考えてみる。

(When I meet a new word, I search in my memory and see if I have any synonyms and antonyms in my vocabulary stock.)

6. ある種の単語を覚えるときは、ジェスチャーなどを交えて覚える。(例： stinking 「ひどく臭い」という単語なら鼻をつまんでみる)

(I attach physical sensations to certain words (e.g., stinking) when I try to remember them.)

7. 単語をより良く覚えるために身振りを入れてみる。

(I act out a word in order to remember it better.)



8. 新出単語を覚えるために頭の中でイメージしてみる。  
(I create a mental image of the new word to help me remember it.)
9. 新出単語を覚えるために、その単語を具体的に絵などにして思い浮かべてみる。  
(I visualize the new word to help me remember it.)
10. 単語を\*接頭辞、\*語幹、\*接尾語で分析する。(\*Part C 参照)  
(I analyze words in terms of prefixes, stems, and suffixes.)
11. より多くの単語を覚えるために、単語がどのように形成されているか（語源など）を意図的に学習する。  
(I deliberately study word-formation rules in order to remember more words.)
12. よく使われる\*語幹と\*接頭語を覚える。(\*Part C 参照)  
(I memorize the commonly used stems and prefixes.)
13. 単語を覚えようとするときはその単語が使われている文を覚える。  
(When I try to remember a word, I remember the sentence in which the word is used.)
14. 新出単語を、使われている文脈と一緒に覚える。  
(I remember the new word together with the context where the new word occurs.)
15. 文脈（例：フレーズ、文、など）に入れたほうが単語はより覚えやすい。  
(I learn words better when I put them in contexts (e.g., phrases, sentences, etc.).)

## **Part H Activation Strategies**

1. 単語を覚えられているかを確認するために、できるだけ多く読む（リーディングする）ことを心がけている。  
(I try to read as much as possible so that I can make use of the words I tried to remember.)
2. 学習したばかりの単語を使って、自分自身の例文を作ってみる。  
(I make up my own sentences using the words I just learned.)
3. 新しく学習した単語を、会話、スピーチ、ライティングでできるだけ使おうとし

ている。

(I try to use the newly learned words as much as possible in speech and writing.)

4. 新しく学習した単語を、現実の状況で使ってみようとしている。

(I try to use newly learned words in real situations.)

5. 新しく学習した単語を、頭の中で想像した場面で使ってみようとしている。

(I try to use newly learned words in imaginary situations in my mind.)

## **Appendix B Strategic Vocabulary Learning Scale for Japanese EFL Learners Used in Studies 2, 3, and 4**

(Originally written in Japanese. Translation mine.)

### **Self-management**

1. 定期的に見直し、覚え直しをする。

(I regularly review the vocabulary I learned to check if I remember it.)

2. 単語帳や語彙リストを持ち歩くなどして、いつでもチェックできる場所においておく。

(I keep a vocabulary book or word list to check the vocabulary anytime I wish.)

3. ノルマ（「1日10個単語を覚える」など）を決めて覚える。

(I try to make it a rule to memorize a certain number of words in a specific time period (e.g., “I will memorize 10 words a day”).)

4. 授業で教えられた以外の語彙も学習しようとしている。

(I try to learn extra vocabulary in addition to what I am taught in class.)

5. 語彙の学習のために決まった時間を取るようになっている。

(I try to take time for vocabulary learning.)

6. (学校、TOEIC、TOEFL、英検などの) テストのために語彙の勉強を特別にしている。

(I consciously set aside time to study vocabulary in order to prepare for tests (such as quizzes at school, TOEIC, TOEFL, or Eiken: English Proficiency Test).)

7. 自分なりの覚え方や確認・復習方法を実行している。

(I use my own methods for remembering, checking, or reviewing vocabulary.)

### **Input-seeking**

8. 英語をたくさん読んだり、聞いたりして語彙に触れる量を増やすようになっている。

る。

(I try to expose myself to English vocabulary by reading or listening a lot.)

9. 普段から英語（の語彙）に触れる環境を自分から作ろうとしている。

(I try to manage the learning environment so as to expose myself to English vocabulary.)

10. テレビ、ラジオ、インターネット（携帯電話）、英語の歌、映画などのメディアを利用するようにしている。

(I try to make use of the media (TV, radio, Internet, mobile phone, or movies) to learn vocabulary.)

11. 実際に使うことを意識しながら語彙の勉強をしている。

(I study vocabulary with the intention of using it.)

### **Imagery**

12. 語の意味から連想できるものなどをイメージしながら覚える。

(When I try to remember vocabulary, I make a mental picture of what can be associated with a word's meaning.)

13. 個人的な経験を想像（イメージ）しながら覚える。

(When I try to remember vocabulary, I link my personal experiences to it.)

14. スペルや単語の形を想像（イメージ）しながら覚える。

(When I try to remember vocabulary, I create an image of the spellings or orthographic forms.)

15. キーワードやゴロあわせを使って覚える。

(When I try to remember vocabulary, I use the keyword method (keyword mnemonic technique).)

16. 単語が良い（ポジティブな）意味を持つのか、悪い（ネガティブな）意味を持つのかイメージして覚える。

(When I try to remember vocabulary, I imagine whether the meaning of the word is negative or positive.)

### **Writing Rehearsal**

17. 何度も繰り返し書いて覚える。

(When I try to remember vocabulary, I write it repeatedly.)

18. どこかに書いて覚える。

(When I try to remember vocabulary, I write it on a note or a card.)

19. 意味だけではなく、つづり（スペル）も覚える。

(When I try to remember vocabulary, I remember not only the meaning but also the spelling of the word by writing it.)

### **Oral Rehearsal**

20. 何度も繰り返し声に出して覚える。

(When I try to remember vocabulary, I say it aloud repeatedly.)

21. 発音も覚えるつもりで声に出して覚える。

(When I try to remember vocabulary, I vocalize it to remember not only the meaning but also the pronunciation of the word.)

22. 例文ごと声に出して覚える。

(When I try to remember vocabulary, I say the sample sentence aloud.)

### **Association**

23. 知っている同義語（類語、例：begin と start）や反意語（対義語、例：positive と negative）に関連させて覚える。

(When I try to remember vocabulary, I associate it with the synonyms (e.g., begin and start) or antonyms (e.g., positive and negative) I already know.)

**24.** その単語の同義語（類語）や反意語（対義語）も一緒に覚える。

(When I try to remember vocabulary, I also memorize the synonyms or antonyms of the word.)

**25.** （意味、音、形が）似ている単語や関連語を使ってグループで覚える。

(When I try to remember vocabulary, I memorize words similar to it (in meaning, sound, or shape) or the related words in a group.)

## **Appendix C Motivation Questionnaire Used in Studies 3 and 4**

(Originally in Japanese by Tanaka & Maeda, 2004 based on Noels, Pelletier, Clément, & Vallerand, 2000)

*I study English...*

### **Extrinsic Motivation**

1. 授業や進学で必要だから。  
(Because I need to get school credits to graduate.)
2. 将来、いい仕事に就きたいから。  
(In order to get a prestigious job in the future.)
3. 仕事に就いた後も、給料などでよい待遇を得たいから。  
(In order to have a better salary later on.)

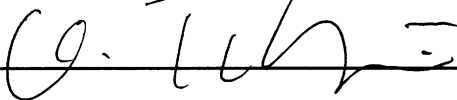
### **Intrinsic Motivation**

4. 英語ができるようになると、今までとは違う自分の新しい一面を見られるから。  
(For the pleasure I experience when surpassing myself in my English studies.)
5. 英語を勉強しつづけていると、今まで聞き取れなかった単語や言葉がわかるようになってくるのが嬉しいから。  
(For the enjoyment I experience when I can grasp the meaning of words if I keep studying.)
6. 英語の難しい課題ができたときの満足感を得たいから。  
(For the satisfaction I feel when I am in the process of accomplishing difficult exercises in English.)
7. 英語が話されているのを聞くと、ワクワクしてくるから。  
(For the “high” I feel when hearing English spoken.)
8. 英語で会話をしていると、楽しくてドキドキするから。  
(For the “high” feeling that I experience while speaking English.)
9. 本物の英語が話されているのを聞くと、嬉しくなるから。  
(For the pleasure I get from hearing English spoken by native speakers of English.)

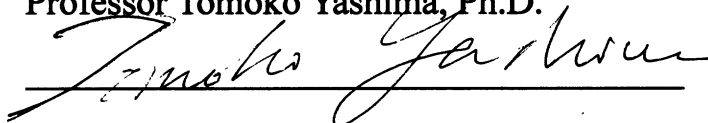
This dissertation of Atsushi Mizumoto is approved.

Doctoral Committee:

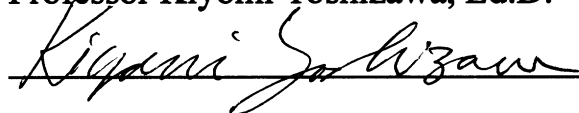
Professor Osamu Takeuchi, Ph.D. (Chair)

  
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