Foreign Language Vocabulary Learning Strategies: Patterns of use among college students

by

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Abstract

The purpose of the current study was to (a) uncover the underlying factors of foreign language vocabulary learning strategies, taking both alphabet-based languages (ABL) and character-based languages (CBL) into consideration; (b) describe students' use of vocabulary learning strategies (VLS) and examine the differences in frequency of VLS use between the two language groups; and (c) identify the effects of gender, college major, motivation and other variables on the use of VLS. Overall, the study was a quantitative inquiry where techniques such as exploratory factor analysis, correlation, group comparisons, and multiple regression were utilized.

Data were collected using a self-report survey – Strategy Inventory of Foreign Language Vocabulary Learning, which consisted of a background information questionnaire, an inventory of vocabulary learning strategies (based largely on Schmitt's 1997 taxonomy and Stoffer's work in 1995), and questions about students' motivation and reasons for taking the current language course. Total of 499 college students enrolled in six language courses, namely, Chinese, French, German, Italian, Japanese, and Spanish, participated in the study.

The results from the factor analyses revealed different data structures for the ABL group and CBL group. Four and five factors were extracted and named for the two language groups respectively. Comparisons of strategy use frequency revealed that students from the two language groups, on one hand, did share some favorite strategies, and, on the other hand, had their own preferences to cope with the unique challenges of the language. Results from analyses

of variance and multiple regression indicated that gender, major, motivation, study time, and GPA were significantly related to students' overall VLS use; while course level, academic level and heritage learner status did not have such effects. Results from the multiple regression analyses also indicated that motivation for learning the language was the best predictor of overall vocabulary language strategy use, which is in accordance with previous studies. Suggestions were made to teachers and students based on the patterns of VLS use emerged for the two language groups.

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Chapter 1

INTRODUCTION

Foreign Language Learning Strategies

Studies on language learning strategies (LLS) originated in the 1970s and worked to understand what good language learners do to help them achieve success in learning a second language (Rubin, 1975; Stern, 1975). Later researchers have discovered that successful second language (L2) learners, compared with their less successful classmates, use more strategic mental processes and employ them more frequently (Oxford, et al., 2004; Oxford & Scarcella, 1994). Therefore, the rationale that the researchers in the field of LLS built their work upon is that the language learner's success should be attributed to the learner's effort and to the language learning strategies they apply, not merely because "they just have an ear for language" (O'Malley & Chamot, 1990, p. 2). A number of studies provided empirical evidence validating the association between language learning strategy use and learning outcomes of second or foreign language learners. Both frequency and patterns of strategy use were found to be related significantly to proficiency (Chou, 2004; Gardner, Tremblay & Masgoret, 1997; Green & Oxford, 1995; Oxford & Burry-Stock, 1995; Oxford & Nyikos, 1989; Politzer & McGroarty, 1985). Researchers have demonstrated that the use of language learning strategies promotes learner autonomy and helps them to be more responsible for their own language learning (Chamot, 2005; Ellis, 1995; Oxford, 1990; Tseng et al., 2006). Such strategies can facilitate the internalization, storage, retrieval, and

use of the new language, and they are tools for self-directed participation in learning, necessary for the development of communicative competence (Oxford, 1990). Therefore, it is reasonable to assume that once the strategies that are used by the more successful language learners are identified, the less successful learners can benefit from them as well by applying these strategies to improve their own learning processes (Hosenfeld, 1977, 1979; Rubin 1987). Also, awareness and appropriate use of learning strategies results in higher proficiency and self-confidence, and less anxiety (Oxford, 1990).

Definitions of language learning strategies have emerged with research in the field of LLS. Table 1 presents a list of different definitions proposed by scholars. Among these definitions, Oxford's was most adopted. Although stated differently, some features of LLS can be synthesized from these definitions. First of all, language learning strategies are by nature concrete actions/behaviors, techniques, or thoughts learners employ when learning a language. They can be conscious or unconscious. Secondly, the use of LLS is for the purpose of enhancing learning, either to improve comprehension, retention, recall, and application, or in general to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations.

Table 1

Definitions of language learning strategies

Scholar	Definition
Rubin (1975)	The techniques or devices which a learner may use to acquire knowledge
Stern (1975)	Strategies are general, more or less deliberate approaches, while techniques are more specific, observable forms of language learning behavior
O'Malley & Chamot (1990)	The special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information

Oxford (1990)	Specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations
Ellis (1994)	Generally, a strategy is a mental or behavioral activity related to some specific stage in the process of language acquisition or language use.
Cohen (1998)	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
Purpura (1999)	Conscious or unconscious techniques or activities that an individual invokes in language learning, use or testing.

Vocabulary Acquisition/Learning

Concurrent with the advancement of general language learning strategies was a developing appreciation for the importance of vocabulary acquisition in second language acquisition (SLA).

Vocabulary, or lexicon, is often considered as the basis of all languages. It plays a crucial role in both the receptive and productive skills associated with effective communication. Experts like Meara (1996), Lawson and Hogben (1996), and Singleton (1999) claimed that vocabulary competence is at the heart of communicative competence and that the major challenge of learning and using a second language lies in the mastery of its vocabulary. Nation (2001) stated that vocabulary learning plays a significant role in a language class program and without sufficient vocabulary as the learning foundation, a learner can hardly become fluent in the target language. “Some researchers have pointed out that errors in vocabulary are more likely to cause misunderstanding, interrupt communication, and make output less comprehensible” (Liu, 2013, p.4). Vocabulary learning, therefore, is central to language acquisition, whether the language is first, second, or foreign (Schmitt, 2000).

On the other hand, vocabulary acquisition is also believed to be one of the most challenging tasks that any learner faces while acquiring another language (Nyikos & Fan, 2007). Laufer (1986) pointed out that from the beginning level all the way up, vocabulary development is one of the most strenuous tasks for foreign language learners. Many difficulties in both receptive and productive use of the target language arise from learners' inadequate vocabulary knowledge. Moreover, learners themselves also claim that lexis is their greatest difficulty in second language. Therefore, the emphasis on learners' responsibility and engagement in the learning process may be especially important with respect to vocabulary learning (Sanaoui, 1995).

In summary, in light of the importance of general language learning strategy and the role vocabulary plays in foreign language learning, vocabulary learning strategies (VLS) are believed to be helpful for learners to discover the meaning and form of lexical items and to internalize, store, retrieve and actively use them in language production (Takač, 2008).

Statement of the Problem

The definition and taxonomy of foreign language learning strategies have been well-researched in the past four decades. Researchers of VLS have gained insights from research on general language learning strategies and vocabulary acquisition, and have attempted to investigate the specific area of vocabulary learning strategies. In the studies on general language learning strategies, strategies related to vocabulary learning are reported to be the most used strategies (Chamot, 1987). In addition, most studies on general language learning strategies stressed memory and cognitive strategies which are closely related to vocabulary learning, with the presupposition that strategies good for vocabulary retention will also benefit language learning in general. In the process of identifying and categorizing

general language learning strategies, many studies dealt indirectly with strategies specifically applicable to vocabulary learning (Hsu, 2012). However, vocabulary learning strategy as a whole is still under-researched. After beneficial strategies are identified, a classification system, or a taxonomy, will be useful to describe these strategies and to lay a common ground for further research. Schmitt (1997) pointed out that one reason why VLS have not been discussed much as a class is precisely because of a lack of an existing inventory of individual strategies. Consequently, Schmitt and other researchers have attempted to identify as well as classify VLS. However, recent literature still calls for a satisfactory taxonomy of vocabulary learning strategy (Takač, 2008). Researchers believe that only mild consensus has been achieved to date on the issue of classification of vocabulary learning strategies (Nyikos & Fan, 2007).

Another issue related to VLS concerns the individual, group, and situational variables that have been identified as influencing factors on the choice and the use of language learning strategy. These variables include gender, age, target language, attitudes, motivation, personality, learning style, aptitude, major/career orientation, national origin/ethnicity, and language teaching methods, to name a few. One variable that is of particular interest in the current study is target language. Roman alphabet-based Indo-European languages such as English, French, and Spanish have been the focus of foreign language learning strategy research for a long time. With the typological differences in writing system between alphabet-based languages (ABL) and character-based languages (CBL, such as Chinese) and realizing the incompatibility of certain strategies with character-based languages, researchers have started to investigate the Chinese language, and studies on Chinese learning strategies emerged in the past ten years (e.g. Arrow, 2004;

Shen, 2005; Winke, 2005; Sung, 2009; Hsu, 2012; Liu, 2013). Instruments measuring Chinese vocabulary/character learning strategies have been developed (Shen, 2005; Liu, 2013). However, to the knowledge of the author, no study to date has looked into the differences in language learning strategy use for learners whose first language (L1) is alphabet-based, when learning a character-based language versus learning another alphabet-based language.

Purpose of the Study

The current study attempted to firstly investigate the typology of vocabulary learning strategy by uncovering the underlying factors of VLS. A number of VLS classifications have been suggested in the literature (e.g. Ahmed, 1989; Gu & Johnson, 1996; Nation, 2001; Schmitt, 1997; Stoffer, 1995; Takač, 2008). However, taking both alphabet-based languages and character-based languages into consideration was the unique contribution of this study to a better understanding of the classification of VLS.

The second goal of the current study was to describe VLS use of the two language groups and examine their differences. With the differences in written systems, it was assumed that students of the two groups use VLS differently, both in frequency and in types of strategies. Therefore, VLS use of the two groups of students was described firstly and the assumption was then tested. The overall strategy use as well as the frequency of use of individual strategies were examined and compared.

Among the individual, group, and situational variables that haven been identified, gender, college major, and motivation were the three of initial interest. Other variables that may potentially affect VLS use were investigated together with the original three. These variables included GPA (Grade Point Average), course level, academic level, being heritage

learner of a language, as well as time spent studying vocabulary. The third goal of the study, therefore, was to identify the effects of those variables on the use of VLS. Group comparisons were performed to find out the differences between the groups of the categorical variables and correlations between the continuous variables and VLS use were examined. A multiple regression was conducted to investigate the performance of these variables in predicting VLS use.

In conclusion, the purpose of the present study included: (a) to uncover the underlying factors of foreign language vocabulary learning strategies, taking both alphabet-based languages and character-based languages into consideration; (b) to describe VLS use of the two target language groups and examine the differences in frequency of VLS use between the two groups; (c) to identify the effects of gender, college major, motivation and other variables on the use of VLS.

Research Questions

Three major research questions were developed in accordance with the purpose of the study:

1. What are the underlying factors/categories of foreign language vocabulary learning strategies?
2. How do students learning alphabet-based languages and students learning character-based languages use vocabulary learning strategies differently?

2.1 Are there differences in frequency of VLS use between ABL learners and CBL learners?

2.2 Are there differences in the types of VLS used by ABL learners and CBL learners?

3. How do factors such as gender, major, motivation influence the use of vocabulary learning strategies?

Theoretical Framework

The theoretical foundations of language learning strategies derive from two camps of learning perspectives: cognitive perspective (mainly information-processing theory) and sociocultural perspective. This section reviews these two theoretical perspectives of LLS.

Cognitive Perspective

One natural connection to draw for language learning strategy is with the cognitive perspective of learning. From the information-processing perspective, cognitive development is about the development of short-term memory capacity, long-term knowledge, and the use of strategies (Pressley & McCormick, 2007). Strategies are defined as "task-specific tactics or techniques, observable or non-observable, that an individual uses to comprehend, store, retrieve, and use information or to plan, regulate, or assess learning" (Galloway & Labarca, 1990). Strategies are important in learning because they (1) overcome short-term memory limitations; (2) transfer information from short-term to long-term memories.

O'Malley and Chamot (1990) applied Anderson's (1985) model of mental operation in learning a skill to language learning. According to Anderson, two kinds of knowledge are involved in the acquisition of skills: declarative knowledge and procedural knowledge. The former is static factual knowledge, or what learners know about a domain; the latter is the faculty to understand and generate language or apply knowledge of rules to solve a problem without conscious application, known as dynamic information. In the case of language learning strategies, the declarative knowledge is the information about the learning strategies, and the procedural knowledge is the automatic use and application of language knowledge.

To explain the mental processes involved in language learning, McLaughlin's (1987) information processing model identifies two concepts central to cognitive theory and language learning. The first concept, automatization, refers to learners' information processing shifting from controlled towards automatic (Mitchell & Myles, 2013). Troike (2006) explains that when learning a new language, controlled processing is required for learners to pay attention to comprehension or producing basic vocabulary or language structure. Controlled processing becomes automatic through learners' repeated practice. When learners have automatized the basic knowledge, the processing capacity is freed for higher level and more complex knowledge, which explains the incremental nature of language learning (Troike, 2006). When information processing acts as a continuing movement from controlled to automatic, learners constantly restructure the target language system. Thus, restructuring, the second notion identified by McLaughlin, is a process that leads to systemic reorganization and reformulation of the target language and accounts for increasing levels of L2 proficiency (Troike, 2006).

In LLS literature, two types of strategies within the information-processing framework are identified: cognitive and metacognitive strategies. According to O'Malley and Chamot (1990) cognitive strategies involve direct manipulation of incoming information in ways that enhance learning. Typical examples are rehearsal, grouping and classifying words, summarizing, inferencing, deduction, imagery, transfer, and elaboration. Metacognitive strategies are higher order executive skills that may entail planning, arranging and evaluating one's own learning.

One characteristic of learning strategies is that strategies are teachable. According to information-processing theory, the fact that cognitive development is partly determined by

developmental increases in use of cognitive strategies suggests that students' thinking and learning can be improved by teaching them strategies that they do not discover and use on their own (Pressley & McCormick, 2007). Teachers are expected not only to teach the content of a subject, but also to instruct students about the strategies they can apply to enhance their learning. One critical aspect of strategy instruction is regarding when to use a certain strategy, i.e. the procedural knowledge in Anderson's (1985) model. Research findings suggest that it only takes brief instructions to teach students how to execute a strategy, yet whether or not the students can use the strategy in appropriate situation is another story. Research that investigates students' failure to continue using strategies they learned before discovers two kinds of failure: failure to maintain strategies in the same situations and failure to transfer strategies to new situations. Besides teaching the strategies per se, researchers proposed utility knowledge and conditional knowledge to be taught as well to increase the likelihood of strategy transfer. Utility knowledge refers to the "knowledge about the potential effects of using a strategy" and conditional knowledge refers to the knowledge about when and where the strategy might apply (Pressley & McCormick, 2007).

Sociocultural Perspective

According to cognitive theorists, learning strategies are complex cognitive skills utilized by learners to maximize their language learning potential and effectiveness. A learner is said to use strategies for language learning effectively if he or she has automatized the strategies (Mitchell, Myles, & Marsden, 2013). Thus, language learning strategies are seen as essential and important in the cognitive theory of language learning. In contrast, the sociocultural perspective views L2 learners' strategy use as "a higher order

mental function, such as analysis, synthesis, planning, or evaluation, which the L2 learner develops with the help of a more capable person in a sociocultural context (Oxford & Schramm, 2007, p. 48). In a recent effort of "bridging the gap between psychological and sociocultural perspectives" on L2 learner strategies, Oxford and Schramm explained in detail about the often-ignored sociocultural perspective of L2 learner strategies.

Sociocultural theory is derived from Vygotsky's cultural-historical theory. The cultural-historical theory emphasizes two foci: the history of human development and the cultural tools that shape this development. The core of this theory is that human development is the result of interactions between people and their social environment. Through observations and the medium of another person in the society, children learn to use symbolic and cultural tools in ways that are specific to the community. This concept of cultural influence on cognitive skills assumes that experience with language or other cultural inventions promote particular skills rather than general cognitive development (Gillen & Hall, 2003). Hence, signs and symbols including human speech and written language, become carriers of both meaning and sociocultural patterns (Gillen & Hall, 2003).

In applying the sociocultural concept of zone of proximal development (ZPD) to second language learning, learners use strategies such as asking questions to interact with a more capable person (e.g. a language teacher or native speaker). As a result, the assistance provided by the more capable person helps the learner "traverse" the ZPD (Oxford & Schramm, 2007).

Lantolf (2006) identifies two central constructs of sociocultural theory for second language learning: Mediation and internalization. *Mediation* refers to "human beings using cultural activities, artifacts, and concepts to connect with other people, the environment,

and their inner worlds" (p. 90). On the other hand, *internalization* is "the process through which members of communities of practice appropriate the symbolic artifacts used in communicative activity and convert them into psychological artifacts that mediate their mental activity" (p. 90).

Even though the cognitive and sociocultural perspectives seem to be rooted in distinct epistemological and ontological views, Oxford and Schramm (2007) claim that the two perspectives can be compatible and propose that they be linked in a single framework. This helps to explain the inclusion of social strategies proposed in several models of LLS (e.g. Oxford, 1990, O'Malley, & Chamot, 1990)

Significance of the Study

This study will add to the literature of foreign language vocabulary learning strategy as well as general foreign language learning strategy. The integration of strategies for learning both alphabet-based languages and character-based languages will make its unique contribution to the typology/classification of vocabulary learning strategies. The descriptions of the current VLS use will inform both students and teachers of the different strategies and the actual use of each strategy. For students, their awareness of multitudes of VLS will give them more insight about what to do when encountering new words and when trying to consolidate words learned. Students' self-awareness of VLS use can be enhanced so that they can take more control of their own learning both inside and outside the classroom (Sung, 2009). For teachers, findings about students' actual use of language learning strategies will help them better implement their instruction. Scholars have pointed out that well-designed learning strategy instruction is based on a thorough understanding of learners' current strategy use (e.g., Chamot, 2005; Oxford, 1990, 1996). Many studies

have shown that effective teaching of learning strategies yields positive results in L2 proficiency (e.g. Huang, 2001; Johnson, 1997). The current study will also make its contribution to the field of LLS and VLS by providing new information on the effects of gender, major, motivation, and other variables.

Chapter 2

LITERATURE REVIEW

This chapter reviews the literature on foreign language vocabulary learning strategies and variables that affect vocabulary learning strategy use. The chapter starts with a brief review of the research on general language learning strategies and vocabulary acquisition. It then shifts its focus to vocabulary learning strategies and reviews the various major VLS models proposed by researchers. Literature on variables that affect language learning strategy use is then reviewed, with emphases on gender, major, and motivation. The chapter ends with a brief explanation of the differences between alphabet-based languages and character-based languages to lay out the rationale for assuming differences in VLS use between the two language groups.

Foreign Language Learning Strategies

The definition and taxonomy of foreign language learning strategies have been well-researched in the past four decades. Research on general language learning strategies has shed light on vocabulary learning strategies. Different models have been proposed to organize language learning strategies into different types to develop a taxonomy or a classification system (e.g. Rubin, 1981; Oxford, 1990; O'Malley & Chamot, 1990; Wenden, 1991; Cohen, 1998; Purpura, 1999; Oxford, 2011). Table 2 summarizes these major LLS models.

Table 2

Major LLS models of classification (Adapted from Yin, 2008)

Theorists	Main Categories	Subcategories	Examples
Rubin (1981)	Direct processes	Clarification/ verification Monitoring Memorization Guessing/ inductive reasoning Deductive reasoning Practice	
	Indirect processes	Creating practicing opportunities Using production techniques	
O'Malley and Chamot (1990)	Cognitive strategies		Grouping, summarizing
	Metacognitive strategies		Planning, monitoring
	Social/Affective strategies		Cooperating, using self-talk
Oxford (1990)	Direct strategies	Memory strategies Cognitive strategies Compensation strategies	Mental imaging Practicing Making guess
	Indirect strategies	Metacognitive strategies Affective strategies Social strategies	Planning Using self-talk Seeking help
Cohen (1998)	Language learning strategies		
	Language use strategies	Retrieval strategies Rehearsal strategies Cover strategies Communication strategies	Mental linkages Practicing Simplification Negative transfer
Oxford (2011)	Metacognitive strategies & tactics		Paying attention, Planning, Evaluating
	Cognitive strategies & tactics		Conceptualizing with details
	Affective strategies & tactics		Building positive emotions, Generating motivation
	Sociocultural-interactive strategies & tactics		Interacting/ Collaborating, Seeking help,

Oxford's 1990 Six-Category Strategy Taxonomy

Among the classifications summarized above, Oxford's (1990) proposal of a six-category system is most influential. LLS are divided into six categories: memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies, and social strategies. The first three categories are direct strategies that directly affect learning while the latter three categories are considered indirect strategies that contribute to learning indirectly. *Memory strategies* help learners link new material to existing knowledge, but do not necessarily involve deep understanding; *Cognitive strategies* enable the learner to directly manipulate and transform the target language material for the purpose of acquiring or retaining that information; *Compensation strategies* help the learner make up for inadequate knowledge of the target language. e.g., guessing from context in listening and reading, using synonyms and "talking around" the missing word to aid speaking and writing; *Metacognitive strategies* involve the overall review of one's own learning process and help the learner making decisions about planning, monitoring, or evaluating the best way to learn; *Affective strategies* serve to direct or regulate one's emotions, motivations, and attitudes related to learning, for example, strategies for reducing anxiety and for self-encouragement; Learners use social strategies to interact with other learners and/or with native speakers as well as understand the target culture.

Oxford's six-category strategy taxonomy is probably the most influential taxonomy of language learning strategies that has had profound influence on later research on language learning strategy and specifically on vocabulary learning strategy. However, like all theories, this model was not free from shortcomings. For example, Schmitt (1997) noted that Oxford's taxonomy was inadequate in places where some strategies could fit into two or

more groups. For example, *interacting with native speakers* is a social strategy; however, it could also be a metacognitive strategy if it is a part of a language learning plan. Also, it is always difficult to distinguish whether some strategies should be classified as memory strategies or cognitive strategies.

Vocabulary Acquisition/Learning

Vocabulary, or lexicon, is often considered as the basis of all languages. It plays a crucial role in both the receptive and productive skills associated with effective communication (Liu, 2013, p4). Experts like Meara (1996), Lawson and Hogben (1996), and Singleton (1999) claimed that vocabulary competence is at the heart of communicative competence and that the major challenge of learning and using a second language lies in the mastery of its vocabulary. Some researchers have pointed out that errors in vocabulary are more likely to cause misunderstanding, interrupt communication, and make output less comprehensible. On the other hand, vocabulary acquisition is also believed to be one of the most challenging tasks that any learner faces while acquiring another language (Nyikos & Fan, 2007). Laufer (1986) pointed out that from the beginning level all the way up, vocabulary development is one of the most strenuous tasks for foreign language learners. Many difficulties in both receptive and productive use of the target language arise from learners' inadequate vocabulary knowledge. Moreover, learners themselves also claim that lexis is their greatest difficulty in second language. Therefore, the emphasis on learners' responsibility and engagement in the learning process may be especially important with respect to vocabulary learning (Sanaoui, 1995).

Vocabulary learning strategies

In the studies on language learning strategies, strategies related to vocabulary

learning are reported to be the most used strategies. For example, Chamot (1987) found that high school ESL learners reported more strategy use for vocabulary learning than for any other language learning activity, including listening comprehension, oral presentation, and social communication. Interestingly, most studies on general language learning strategies stressed memory and cognitive strategies which are closely related to vocabulary learning, with the presupposition that strategies good for vocabulary retention will also benefit language learning in general. In the process of identifying and categorizing general language learning strategies, many studies dealt indirectly with strategies specifically applicable to vocabulary learning (Hsu, 2012). Schmitt (1997) noted that we can derive a number of tentative general conclusions about VLS when we combine the results from general learning strategy research with those from more vocabulary-specific studies. Admittedly, research on general language learning strategies does shed light on the specific field of vocabulary learning strategies. However, vocabulary learning strategies as a whole is still under-researched. According to Takač (2008), "one of the unsolved issues is a satisfactory typology of vocabulary learning strategies" (p.59). In a review of vocabulary learning strategy research from the past three decades, Nyikos and Fan (2007) concluded: that only mild consensus has been achieved to date on the issue of classification of vocabulary learning strategies.

> The lack of uniformity in terminology among researchers has made it difficult to compare even the most rigorous research findings across studies. An exhaustive and mutually exclusive typology of vocabulary learning strategies coupled with standardized valid measures of proficiency and vocabulary learning would permit more exact analysis and comparison of future research findings (Nyikos & Fan, 2007, p255).

Considered as a subcategory of general language learning strategies, vocabulary learning strategies are a relatively new area of study in second language acquisition. It had not attracted researchers' attention until the 1990s with the advance in language learning strategies and increasing appreciation for the importance of vocabulary acquisition (Liu, 2013). In the past two decades, several VLS classification models have been suggested. The development of VLS research has gone through two major phases: *exploration* and *organization*.

The Exploration Phase of VLS Research

In the first stage, studies of VLS were exploratory in nature. Techniques such as interview, classroom observation were employed to elicit leaner strategies to form the pool of individual strategies. Preliminary classifications were also suggested in these studies.

The first study of VLS can date back to the work of Ahmed (1989), although he did not explicitly define strategies. His original study aimed to identify the vocabulary learning strategies used by 300 Sudanese learners of English. Unlike the earlier studies on language learning strategies which were only concerned with good language learners and their strategy use (e.g., Rubin, 1975; Stern, 1975; Naiman et al., 1978), Ahmed wanted to discover the differences between good and poor learners with regard to how they applied vocabulary learning strategies. In addition, Ahmed did not only want to identify the vocabulary learning strategies at the "macro-level," but also at the "micro-level." *Macro-strategies*, as Ahmed defined, refer to the general approaches to learning, while *micro-strategies* are the "more detailed, specific learner behaviors". An example Ahmed gave was that, at the macro-strategy level, most good learners engage in what might be called "practice." However, some learners use specific micro-strategies in their practice which do

not appear in the behavior of other learners; for instance, some learners test themselves systematically as part of their practice, while others do not. Three data collecting procedures, namely, a think-aloud task, direct observations during the think-aloud procedure, and an interview with the help of a questionnaire were used in Ahmed's study. As a result, 38 micro-strategies were identified and organized into six macro-strategies (see Table 3 below).

Table 3

List of macro- and micro-strategies identified by Ahmed (1989, pp. 10-11).

Macro-strategies	Micro-strategies
Information sources	ask classmates guessing ask teacher overlook ask for L2 paraphrases ask for L1 equivalent ask for example of use group work dictionary
Dictionary use	monolingual dictionary bilingual dictionary look up meaning look up derivation look up word class look for example of use
Memorization	write and repeat aloud repeat aloud write, repeat and L2 synonym write, repeat and L1 equivalent
Practice	new word in real situation new word in imaginary situation ask for test ask others to verify knowledge use written source to verify knowledge self-test
Preferred source of information	asking somebody group work dictionary

Note-taking	take notes at all notes in margin vocabulary book ordering new words sequentially organizing words by meaning spelling info L1 equivalent L2 synonym L1 equivalent and L2 synonym word derivations grammatical info

The results also showed that, in general, the good learners used a variety of strategies, had a clear awareness of what they could learn about new words, knew that it is important to learn words in context, were conscious of the semantic relationship between new and already learned-L2 words, and made full use of monolingual or bilingual dictionaries to get many kinds of information. The poor language learners, on the contrary, applied a much smaller range of strategies, showed little interest in learning words in context, and did not know how to connect the new words to old knowledge.

In 1995, Sanaoui presented a qualitative inquiry aiming to investigate adult learners' approaches to learning vocabulary in English and French as second languages generally and, specifically, the mnemonic procedures they used to help them retain the learned vocabulary. Three consecutive studies (in 1990, 1992, and 1993) were included in the paper. The qualitative data were collected using daily written records, interviews, questionnaires, and the researcher's own records of materials which the participants had used, such as course materials and dictionaries. Data analysis revealed that the adult learners took two distinct approaches to learning vocabulary in a second language: a structured (or organized) approach and an unstructured (or unorganized) approach. *Structured* learners study vocabulary in a more organized and systematic fashion, whereas

unstructured learners are less systematic in vocabulary learning. As demonstrated in Table 4, the two identified approaches differ in five aspects.

Table 4

Features of a structured and an unstructured approach by Sanaoui

(Adapted from Sanaoui, 1995)

Aspects	Structured Approach	Unstructured Approach
Opportunities for learning vocabulary	self-created independent study	reliance on course minimal independent study
Range of self-initiated activities	extensive	restricted
Records of lexical items	extensive (tend to be systematic)	minimal (tend to be ad hoc)
Review of lexical items	extensive	little or no review
Practice of lexical items	self-created opportunities in and outside classroom	reliance on course

Another exploratory VLS study was conducted by Lawson and Hogben in 1996. They investigated Australian university students learning the meaning of 12 new Italian words by means of observing the behavior in a think-aloud procedure, which enabled them to look at which strategies learner actually used (as opposed to what students claim to use). Due to the obvious time-consuming nature of the procedure, the sample under investigation was small -- 15 female advanced-level university students. Based on the analysis of the tape-scripts Lawson and Hogben classified the vocabulary learning strategies into four broader categories with a total of 15 strategies (see Table 5 below). Their research shows: a) Learners who recall more words used a greater range of strategies and used strategies more often than learners who recalled fewer words. b) The most frequently used strategy category was repetition and least frequently used strategy category was word feature analysis.

The strategies were concerned more with repeating the new information than with

transforming it in a way that would set up relationships of the new material with existing memory structures. Relatively little activity was concerned with detailed analysis of the word and its meaning in ways that would allow for the establishment of powerful associative relationships between the two" (p. 121).

An interesting finding from this study was the lack of association between the context and the recall of the word's meaning. Lawson and Hogben noticed that a rich context may be helpful for generating the meaning of the unknown word, but it does not necessarily lead to long-term retrieval of the word's meaning, because learners are likely to pay less attention to the unknown word since they could comprehend the text or the sentence without knowing the word anyway. Hence, Lawson and Hogben argued that it is necessary to "distinguish between the use of context for generation of meaning of a new word and the use of context for acquisition of the meaning for subsequent recall" (p. 131).

Table 5

Classification of VLS by Lawson and Hogben, 1996

Categories	Strategies
Repetition	Reading of related words Simple rehearsal Writing of word and meaning Cumulative rehearsal Testing
Word Feature Analysis	Spelling Word classification Suffix
Simple Elaboration	Sentence translation Simple use of context Appearance similarity Sound link
Complex Elaboration	Complex use of context Paraphrase Mnemonic

The Organization Phase of VLS Research

Soon after the years of eliciting strategies, researchers started the attempt to categorize these vocabulary learning strategies systematically in light of general learning strategy categorizations.

Using actual learner data and statistical procedures (i.e. exploratory factor analysis) to establish the categories, Stoffer's (1995) research is considered a step forward. Stoffer carried out a series of studies (including two pilot studies and a large-scale study involving 707 students) to measure the frequency of the use of vocabulary learning strategies and its relationship to other variables such as previous language learning experience, course level, language studied, instruction, major, age and gender. The research participants of this study were students taking different language courses (i.e., German, Japanese, French, Spanish, and Russian) at the beginner's level at the University of Alabama. To collect data, Stoffer developed a questionnaire that contained 53 items, *Vocabulary Learning Strategies Inventory (VOLSI),* based on Oxford's (1989) Strategy Inventory for Language Learning (SILL) to particularly measure the frequency of strategies used in learning foreign language vocabulary.

The VOLSI and Oxford's SILL were administered to all participants. The results showed that both instruments were reliable with internal consistency reliability coefficients of .90 and .93 respectively. Using the statistical procedure of exploratory factor analysis, Stoffer proposed a classification of the VOLSI into nine categories (see Table 6 below). Several strategies were classified into two different categories. For instance, the strategy "use pantomime and gestures to practice" was categorized as "strategies involving creative activities" (group 2) and as "strategies involving physical action" (group 7); the

strategy "use rhymes to remember new words" appeared in both group 5 (memory strategies) and group 6 (visual/auditory strategies).

Table 6

Stoffer's (1995) vocabulary learning strategy taxonomy

Strategy category	Examples
Strategies involving authentic language use	Read L2 newspapers and magazines Picture oneself using word in situation
Strategies involving creative activities	Use computer programs to practice words Record words on tape and listen
Strategies used for self-motivation	Try to relax when afraid of using word Quiz myself or have others quiz me
Strategies used to create mental linkages	Link word to similar sounding L1 word Use natural associations (opposites)
Memory strategies	Use flashcards Repeat new word aloud several times
Visual/auditory strategies	Arrange words on page to form patterns Associate with preceding/following word
Strategies involving physical action	Use pantomime and gestures to practice Physically act out new words
Strategies used to overcome anxiety	Notice when tense or nervous Try to relax when afraid of using word
Strategies used to organize words	Group words by grammatical class Group new words by topic

The study showed that participants believed they used the fourth category most frequently (i.e., strategies used to create mental linkage), and the second category (i.e., strategies involving creative activities) least frequently. Also, there seemed to be a tendency for the more experienced learners to use strategies more frequently than the novice learners. Further, age did play a role in the use of vocabulary learning strategies: older learners used strategies more often than younger learners. However, gender did not make a significant difference in strategy use. One interesting finding closely relevant to the current study is that learners who were learning a foreign language lexically distant from English (e.g. Russian or Japanese) used vocabulary learning strategies more frequently than those

learning German and Spanish.

The measuring instrument, the VOLSI, is perhaps the first instrument specifically designed to measure VLS. As Stoffer herself mentioned, all the items on the VOLSI evolved directly from the literature. Although she did not address her effort to avoid the issues of content underrepresentation or construct irrelevancy, the in-depth review of related literature does give evidence of item content accuracy. Stoffer also mentioned that at the end of the instrument, respondents were asked to list any strategy they used for learning new vocabulary which had not been listed as an item on the measurement scale. Not a single additional item was received. Therefore, Stoffer concluded that it was likely safe to assume that most areas of the theoretical construct had been covered in the instrument. In addition, the items of the instrument were reviewed by several experts in the area of foreign / second language learning. It is worth noticing that the chairperson of Stoffer's dissertation committee was Dr. Rebecca Oxford, who's among the first scholars that investigated foreign language learning strategies. Oxford's SILL is widely adopted by scholars in the studies of language learning strategies. It is reasonable to believe with the guidance of Oxford, the VOLSI's content relevance and representativeness should be examined in the test development process. In regard to reliability, Cronbach's alpha was used as the indicator in both pilot studies and the main study of Stoffer's, where the VOLSI was developed. The alphas were .86 and .76 in the two pilot studies, and .90 in the main study. The spectrum of the item-to-total correlations of the VOLSI reached from .19 to .5, with the majority of items in the area of moderate to high correlations (.30 to .50).

However, this survey suffered some flaws as pointed out by some researchers. For example, many items for a particular factor in VOLSI seem to be conceptually unrelated

(Tseng, Domyei, & Schmitt, 2006). Some of the items are also somewhat outdated. For example, some statements mentioned "I organize new words on my word processor" or "I record new words on a tape…" etc. Still other items from the VOLSI were found to be somewhat repetitive. For example, items 48 to 51 are related to watch movies, read newspapers and magazines, read literature and poetry, and listen to radio programs.

Another large-scale study was conducted by Gu and Johnson (1996) on 850 second-year Chinese students learning English at Beijing Normal University. They developed a Vocabulary Learning Questionnaire (VLQ Version 3) with 113 statements concerned learners' belief about how vocabulary should be learned (17 items) and learners' use of vocabulary learning strategies (91 items). Participants were asked to rate each of the statements on a 7-point scale from *Absolutely Untrue of Me (1)* to *Absolutely True of Me (7)*. The statements represented three major dimensions of beliefs: words should be memorized; words should be acquired in context; and words should be studied and put to use. The dimensions of strategies include: metacognitive regulation, guessing strategies, dictionary use strategies, note-taking strategies, memory strategies for rehearsal, memory strategies for coding, and activation strategies (See Table 7). The results from the questionnaire showed that, contrary to common assumptions about Asian learners, the participants predominantly believed that vocabulary should be carefully studied and then put to use, not merely be memorized. Mechanical memorization such as rote repetition was not popular among the Chinese students either. What these students said they did most for vocabulary learning was guessing from context, using a dictionary for comprehension or learning, and taking notes.

Table 7

Gu and Johnson's (1996) strategy categories

Dimensions	Categories	Examples
Metacognitive regulation	Selective attention	I know which words are important for me to learn
	Self-initiation	Besides textbooks, I look for other readings that fall under my interest.
Guessing strategies	Using background knowledge/ wider context	I check my guessed meaning against the wider context to see if it fits in.
	Using linguistic cues/ immediate context	I make use of the part of speech of a new word when guessing its meaning.
Dictionary use strategies	Dictionary strategies for comprehension	When I see an unfamiliar word again and again, I look it up.
	Extended dictionary strategies	When looking up a word. I read sample sentences illustrating various meanings of the word.
	Looking-up strategies	If the unknown appears to be an irregularly inflected form or a spelling variant, I will scan the nearby entries.
Note-taking strategies	Meaning-oriented	I write down both the Chinese equivalent and the English synonyms of the word I look up.
	Usage-oriented	I make a note when I see a useful expression or phrase.
Memory strategies for rehearsal	Using word lists	I make vocabulary lists of new words that I meet.
	Oral repetition	When I try to remember a word, I repeat it aloud to myself.
	Visual repetition	I memorize the spelling of a word letter by letter.
Memory strategies for encoding	Association/Elaboration	I remember a group of new words that share a similar part in spelling.
	Imagery	I create a mental image of the new word to help me remember it.
	Visual encoding	I associate a new word to a known English word that looks similar.
	Auditory encoding	I remember together words that sound similar.
	Word-structure	I analyze words in terms of prefixes, stems, and suffixes.
	Semantic encoding	When I meet a new word, I search in my memory and see if I have any synonyms and antonyms in my vocabulary stock.
	Contextual encoding	When I try to remember a word, I remember the sentence in which the word is used.
Activation strategies		I try to use newly learned words as much as possible in speech and writing.

Schmitt's (1997) taxonomy is one that has been extensively exploited in a number of relevant studies due to its several advantages over others. Based on Oxford's (1990) six-fold classification of language learning strategies, Schmitt proposed his two-dimension taxonomy of vocabulary learning strategies that consisted of Discovery strategies and Consolidation strategies. *Discovery strategies* are used to determine the meaning of new words, and *Consolidation strategies* are those that learners use to keep the meaning related information in memory. For the subcategories under the two dimensions, Schmitt adopted four of the six categories in Oxford's taxonomy – social, memory, cognitive, and metacognitive strategies. He noted that there was no category in Oxford's system which adequately describes the kind of strategies used by an individual when faced with discovering a new word's meaning without recourse to another person's knowledge. Accordingly, he proposed the category of determination strategies to make his taxonomy more complete and suitable for categorizing vocabulary-specific strategies. As shown in Table 8, the subcategories in discovery strategies included determination and social strategies, and consolidation strategies included social, memory, cognitive and metacognitive strategies. Social strategies were included in both categories because they can be used for both purposes.

Table 8

Schmitt's (1997) taxonomy of VLS

Dimensions	Subcategories	Examples
Discovery strategies	Determination strategies	Analyze part of speech Analyze affixes and roots Bilingual dictionary
	Social strategies	Ask teacher for paraphrase or synonym of a new word Ask classmates for meaning

Consolidation strategies	Social strategies	Study and practice meaning in a group Interact with native-speakers
	Memory strategies	Group word together to study them Say new word aloud when studying
	Cognitive strategies	Verbal repetition Take notes in class
	Metacognitive strategies	Testing oneself with word tests Continue to study word over time

The findings from Schmitt's study revealed that using a bilingual dictionary, guessing a word's meaning from context, and asking classmates for help were the most common discovery strategies. Verbal repetition, written repetition, and studying the spelling of the word were the most frequently used consolidation strategies. The least popular strategies among the sample of Japanese learners were the use of physical action, L1 cognates, and semantic maps. This finding that the strategies requiring deeper mental processing were not as popular basically echoes the research results from Lawson and Hogben (1996) as described above. Many of the popular strategies were perceived by the participants to be helpful as well. Similar results were observed when the participants were further asked to rate the five most helpful strategies for both the Discovery and Consolidation sections. Strategies perceived as less helpful were imaging a word's meaning, using cognates, imagining word form, skipping or passing a new word and the Keyword Method.

According to Takač (2008), Schmitt's taxonomy is "currently the most comprehensive typology" of vocabulary learning strategies. The individual strategies in each category derive from relevant research literature, learners' retrospective descriptions of their own strategies, and teacher's experiences. Catalan (2003) has found several advantages to using the taxonomy as a research instrument: it can be standardized for assessment goals; can be utilized to collect the answers from students easily; can be applied to learners of different

educational backgrounds and target languages; it is based on the theory of learning strategies as well as on theories of memory; it is technologically simple and rich and sensitive to the variety of learning strategies; it also allows comparison with other studies. Nevertheless, Liu (2013) pointed out some pitfalls of Schmitt's study:

> First, as the researcher himself recognized, there is a large degree of overlap between the Discovery and Consolidation categories. It is, therefore, difficult to interpret the extent to which the two categories of strategies are different from each other. Second, it is unclear as to whether the strategies classified into the five categories really share the common underlying factors. This is because the statistical procedure of factor analysis was not performed as an indication of the validity of the questionnaire (p. 34).

In the most recent attempt concentrating on vocabulary learning strategies, Takač (2008) described three large-scale empirical studies. The goal of the first study was to construct a questionnaire to measure the use of vocabulary learning strategy used by primary school students (aged between 10 and 14) learning foreign languages (e.g., English, German, Russian … etc.) in Croatia. After a series of factor analyses, the Vocabulary Learning Strategy Questionnaire for Elementary Schools (VOLSQES) was reduced to the final 27 items. Consequently, Takač proposed a classification of VLS that contained three broad categories: (1) formal vocabulary learning and practicing, (2) self-initiated independent vocabulary learning, and (3) spontaneous (incidental) vocabulary learning (acquisition) (See Table 9). *Formal vocabulary learning and practicing* referred to strategies involving rote memorization, reliance on L1, and a metacognitive aspect of regular and planned revision. The second category, *self-initiated independent vocabulary learning*, included the strategies of exposure to the target language and those strategies that reveal

an elaborated approach to vocabulary study including the use of memory strategies. The third category, *spontaneous (incidental) vocabulary learning (acquisition)*, consisted of spontaneous vocabulary learning in naturalistic learning situations as well as communication strategies (Takač 2008, p. 100).

Table 9

Takač's (2008) classification of VLS

Categories	Examples
Formal vocabulary learning and practicing	Repeating new words aloud when studying Translate words into L1 Planning for vocabulary learning
Self-initiated independent vocabulary learning	Taking notes while reading for pleasure Grouping words together to study them Using new words in sentences
Spontaneous (incidental) vocabulary learning (acquisition)	Remembering words from books, magazines Associating new words with already known Using synonyms in conversations

The third study by Takač was a cross-linguistic survey study aiming to explore the differences in vocabulary learning strategies used by learners of English and German. Participants were 675 elementary school students in Croatia, aged between 11 and 14, with a breakdown of 322 learners of English and 353 of German. The VOLSQES was used as the instrument for data collection. The results of independent-samples t-test showed statistically significant differences between the two groups of learners in 15 out of the 27 strategies in terms of frequency. Generally, English learners more frequently used the following vocabulary learning strategies which are all classified under the category of spontaneous incidental vocabulary learning in the classification Takač proposed. Learners of German, on the other hand, more often used strategies that were grouped under the category of formal vocabulary learning and practicing and the category of self-initiated

independent vocabulary learning.

In summary, although several classification models had been proposed in the past two decades, there has not been a single satisfactory model outstanding among others. The issue of classification of VLS is still to be explored and a satisfactory typology of VLS is yet to be discovered.

Variables that Affect Strategy Use

A number of studies have been conducted on the variables that are related to the choice and the use of learner strategies and how strong the influence of a certain variable is. A rationale behind studying the effects of individual, group, and situational variables on strategy use is that "strategy instruction should be geared to learners' individual and situational or group needs" (Takeuchi, Griffiths, & Coyle, 2007, p. 70).

Oxford and Nyikos (1989) conducted a study investigating the language learning strategies employed by university students and exploring the potential variables that may affect students' choices of learning strategies. The variables they identified included: target language; duration; degree of awareness; age; sex; affective variables such as attitudes, motivation level/intensity, language learning goals, motivational orientation, personality characteristics, and general personality type; learning style; aptitude; career orientation; national origin; language teaching methods; task requirements and type of strategy training. They concluded in the study that among all variables, motivation was the most powerful influence on the choice of language learning strategies. They discovered that highly motivated students used a wider variety of learning strategies, and that they used them more often than less-motivated students. Furthermore, the higher a student's self-perceived proficiency, the more frequently he or she used learning strategies.

One problem with Oxford and Nyikos' study was in regards of the measurement they employed in the study. Instead of using any instrument to measure variables like motivation and proficiency, they used one-question overall self-evaluation to ask participants to identify themselves to be low-, moderate-, or high-motivated, and their proficiency level in speaking, reading, and listening. Regardless of the shortcoming of their study, Oxford and Nyikos' study is considered one of the earliest attempts to investigate the variables influencing language learning strategy choices.

In a recent review of the variables that are related to strategy use (Takeuchi, Griffiths, & Coyle, 2007), a list of individual, group, and situational variables are analyzed, among which sex, major, and motivation are of particular interest in the current study.

Gender

The variable of gender/sex has not received much attention in both general language learning strategy field and the specific field of vocabulary strategy although it is a common variable in social sciences (Catalan, 2003). Significant sex differences in strategy use were reported in the use of strategy categories, i.e., specific types of strategies, and the use of skill-specific strategies (i.e., reading strategies, listening strategies etc.). In a recent literature review by Yin (2008), it is concluded that females generally reported using strategies more often than males in most of the strategy categories. However, it is noteworthy that several studies did report non-significant sex differences in overall strategy use and/or the use of strategy categories (e.g., Griffiths, 2003; Nisbet, Tindall, & Arroyo, 2005) and one study reported that men used a significantly greater number of strategies than women (Wharton, 2000).

Major/Career Choice

Several studies addressed the effect of major/career choice on strategy use. Oxford and Nyikos (1989) found that humanities/arts majors used functional practices strategies and "resourceful, independent strategies" more frequently than technology majors. In a comparison of arts majors and science majors, Gu (2002) found significant differences in the use of three vocabulary learning strategies. Specifically, the art students used note-taking strategies (both meaning-oriented and usage-oriented note-taking) significantly more often than science majors. Science students, in contrast, used the strategy of analyzing word structure more often. In a large-scale study with Hong Kong ESL learners across eight academic disciplines, Peacock and Ho (2003) found that (a) English majors' overall strategy use is the more frequent among all majors; (b) English majors reported a much higher use of cognitive, metacognitive, and social strategies than did students from other disciplines; (c) computer science students reported a much lower use of metacognitive strategies.

Although a small number of studies in the literature examine the influence of major/career choice on strategy use, it is believed that the influence is either "not as strong as gender" (Gu, 2002), or is confounded with other factors (e.g. Politzer & McGroarty, 1985).

Motivation

As a much stronger factor, motivation is found to be correlated with both overall strategy use and the use of specific strategies. Studies in the literature reached a general consensus that learners who are more motivate tend to use a wider range of strategies and to use these strategies more frequently. Oxford and Nyikos (1989) found that out of five

strategy categories, highly motivated learners used four significantly more often than did less motivated learners.

A number of studies found very strong relationships between strategy use and motivational aspects. In a study conducted with learners of Japanese and Spanish, Okada, Oxford, and Abo (1996) found metacognitive, cognitive, and social strategies are highly correlated with several motivational aspects. Oxford, Park-Oh, Ito and Sumrall (1993) indicated that increased strategy use was correlated with greater intensity of instrumental/general motivation and integrative/personal motivation. In a study by Schmidt and Watanabe (2001), the overall strategy use was significantly correlated with the overall motivation and with three motivation factors: value, motivational strength, and cooperativeness.

Differences in VLS Use Influenced by Target Languages

Among the individual, group, and situational variables, in addition to what are discussed in above section, target language also has great influence on strategy choice and strategy use as well. This section reviews the literature related to this influence with a special emphasis on the differences between alphabet-based and character-based languages

Target Language Affecting Strategy Use

Target language is simply defined as the language being learned by the foreign language learners. It is reported to be one of the factors that influence learners' strategy by a number of studies. Chamot and colleagues (1987) found that students of Russian reported more strategy use than students of Spanish. Likewise, Politzer (1983), in examining the learning strategies of students of French, Spanish, and German, discovered

that students of Spanish engaged in fewer positive strategies than did students of the other languages. Comparing leaners of German and learners of English, Takač's (2008) reported German learners use more memory strategies and the metacognitive aspect of planned learning. On the other hand, English learners' approach to vocabulary learning is more spontaneous and indirect thus possibly creating opportunities for incidental vocabulary acquisition. Generally, the obvious conclusion regarding the relationship between target language and strategy use is that the harder the language is, the more strategies learners use to cope with difficulties. How then, can a language be considered as harder than another? The concept of "linguistic distance" was developed to answer this question. Crystal (1987) in *The Cambridge Encyclopedia of Language* wrote regarding linguistic distance:

> The structural closeness of languages to each other has often been thought to be an important factor in FLL (foreign language learning). If the L2 is structurally similar to the L1, it is claimed, learning should be easier than in cases where the L2 is very different (p. 371).

Empirical research findings were supportive: Odlin (1989) have demonstrated that Swedish- and Spanish-speaking learners of English acquire vocabulary faster and more successfully than Finnish- and Arabic-speakers. Swedish, Spanish, and the target language, English are all Indo-European languages, whereas Finnish and Arabic are not. As Swan (1997) pointed out, related languages often share a great deal of cognate vocabulary, and even where vocabulary is not cognate, there tend to be close translation equivalents: this can give learners an enormous advantage. "Where languages have less common ground, word forms will generally be quite different; more information about word meaning and

use has to be acquired from scratch" (p.163). It has been shown that, as one might expect, those foreign words which conform more or less to the phonetic and orthographic patterns of the mother tongue are the easiest to assimilate (Laufer, 1990, Ellis and Beaton, 1993, cited in Swan, 1997). Koda (1996) pointed out that if two languages share similar orthographic systems, the development of the L2 word recognition could be facilitated greatly. On the other hand, different orthographies foster different strategies for setting up the orthographic architecture, and consequently, require different processing skills.

Alphabet-Based vs. Character-Based Languages

Hsu (2012) argued that the majority of the studies of vocabulary acquisition are limited to Roman alphabet-based Indo-European languages such as English, French, and Spanish. Into the new century, character-based languages, especially Chinese, have gained much popularity in the US. Studies on Chinese learning strategies (including Chinese vocabulary learning strategies and Chinese character learning strategies) have emerged in the past ten years (e.g. Arrow, 2004; Shen, 2005; Fu, 2005; Winke, 2005; Sung, 2009; Hsu, 2012; Liu, 2013;). Instruments measuring Chinese vocabulary/character learning strategies have been developed (Shen, 2005, Liu, 2013). Two doctoral dissertations (Arrow, 2004; Hsu, 2012) have investigated the issue of the differences in strategy use between English-speaking leaners and Japanese-speaking learners learning Chinese as a foreign language to demonstrate the influence of L1 on L2 acquisition. However, to the knowledge of the author, no study to date has looked into the differences in strategy use for alphabet-based L1 speakers learning a character-based language versus learning another alphabet-based language.

In current typological classification of writing systems of the world's languages, four basic types of languages were identified: (1) pictographic, (2) logographic (or morphemographic), (3) syllabic, and (4) alphabetic (Lyovin, 1997). According to Lyovin, Chinese is the only modern that still uses a logographic system of writing. Japanese's Kanji, one of the three writing systems, borrowed from Chinese characters, is therefore logographic in nature. The other two systems, hiragana and katakana are syllabic in nature. Beginning learners of Japanese spend a great amount of time learning the two latter systems. As the learning continues, most of the words learners encounter are in characters. Therefore, in this study, since all students were already out of the stage of learning hiragana and katakana, the logographic-syllabic Japanese language was categorized as a character-based language, with Chinese language. The other four languages of this study, Spanish, French, German, and Italian are all alphabetic languages.

Table 10 illustrates a selection of words from the target languages of interest of this study to serve as a direct visual presentation of the differences existed between the two types of languages.

Table 10

Comparison of sample words from the six target languages of this study

English	Spanish	French	German	Italian	Chinese	Japanese
photo	foto	photo	foto	foto	照片	写真
research	investigación	recherche	forschung	ricerche	研究	研究
beautiful	bonito	beau	schön	bello	美丽	美しい
interesting	interesante	intéressant	interessant	interessante	有趣	興味深い
to eat	comer	manger	essen	mangiare	吃	食べる
to study	estudiar	étudier	studieren	studiare	学习	勉強する

An underlying assumption of the current study is that, with the typology differences between the two families of languages, learners would use vocabulary learning strategies differently to cope with different difficulties of the language. When a learner is learning a character-based language, strategies that are related to word-spelling would not make sense because one does not "spell" a word in a character-based language. Similarly, on the other hand, strategies that have to do with shape of the characters, radicals, and strokes would not apply if a learner is learning an alphabet-based language. Examples of such strategies can be found in Table 11.

Table 11

Examples of unique VLS that apply to character-based language

Unique vocabulary strategies	Strategy measuring instruments
I create stories to remember the shape of a word.	Chinese Vocabulary Learning Strategies Survey (Liu, 2013)
I use radicals to help me recognize and remember Chinese words.	Chinese Vocabulary Learning Strategies Survey (Liu, 2013)
I look carefully at the strokes and try to make associations with a similar character (or word) previously learned.	Strategy Inventory for Character Learning (Shen, 2005)
I try to visualize the character in my head.	Strategy Inventory for Character Learning (Shen, 2005)
I observe the character (or word) carefully and pay attention to stroke order.	Strategy Inventory for Character Learning (Shen, 2005)
I use my imagination to picture the meaning that the character represents, as if each character is a picture.	Strategy Inventory for Character Learning (Shen, 2005)

The unique strategies of each language type tend to be cognitive or memory strategies in nature. The metacognitive and social/affective strategies do not differ in content for the two language groups. However, they could differ in frequencies of use by learners. One hypothesis could be since character-based languages are linguistically farther from English than the other alphabet-based languages, learners of character-based languages may

experience more negative emotions so that more affective strategies may be used. It is also hypothesized that since Chinese vocabulary is so different from that of English, English-speaking learners of Chinese will use cognitive and memory strategies significantly more often than alphabet-based language learners.

Chapter 3

METHODS

This chapter describes the methods and procedures involved in the present study. It revisits the purpose of the study and research questions that the study attempts to answer, presents an overview of the design, and describes the participants, the instruments, as well as data collection and data analyses procedures.

Purpose of the Study

The purpose of the current study was to: (a) uncover the underlying factors of foreign language vocabulary learning strategies, taking both alphabet-based languages and character-based languages into consideration; (b) describe VLS use and examine the differences in frequency of VLS use between the two language groups; (c) identify the effects of gender, college major, motivation and other variables on VLS use.

Restatement of Research Questions

This study attempts to address the following research questions:

1. What are the underlying factors/categories of foreign language vocabulary learning strategies?
2. How students learning alphabet-based languages and students learning character-based languages use vocabulary learning strategies differently?

2.1 Are there differences in frequency of VLS use between ABL learners and CBL learners?

2.2 Are there differences in the types of VLS used by ABL learners and CBL learners?

3. How do variables such as gender, major, motivation influence the use of vocabulary learning strategies?

Overview of the Research Design

Overall, the current study was a quantitative study about vocabulary learning strategy use of American university students learning foreign languages. Exploratory factor analysis (EFA) was conducted to discover the underlying factors that produce the relationship among the specific strategies. Correlations, group comparisons, and multiple regression techniques were applied to investigate the influence of affecting factors on VLS use.

Data were collected using a self-compiled survey – Strategy Inventory of Foreign Language Vocabulary Learning, which consisted of a background information questionnaire, an inventory of vocabulary learning strategies (based largely on Schmitt's taxonomy and stoffer's work), and questions about students' motivation and reasons for taking the current language course.

Population and Sample

The target population of the current study is college students learning alphabet-based and character-based languages in the U.S. Convenience sampling procedures were used to draw a sample of foreign language students from Auburn University. The

Department of Foreign Languages and Literatures at Auburn University offers a variety of foreign language courses including Spanish, French, German, Italian, Russian, Chinese, Japanese, and Korean. A large number of English-speaking learners of other languages were available for data collection. A total of 700 students were enrolled in the target 34 classes of the six target foreign language courses in the spring semester of 2014 according to the university's management system. All students who were present at the time of data collection were invited to participate. Participants who were under 19 years old were not given the survey due to the unavailability of parental consent forms required by the university's Institutional Review Board for the Protection of Human Subjects in Research (IRB). Participation was voluntary. As a result, 499 surveys were collected, of which 7 were excluded from the analyses because the strategy inventory section was either not completed or lacking variations. Consequently, 492 valid cases were retained for further data analyses.

Instrumentation

The measuring instrument used in this study was the Strategy Inventory of Foreign Language Vocabulary Learning (see Appendix A) developed by the author. This self-report questionnaire consisted of three parts: learner demographic information, strategy inventory, and motivation section. The demographic section of the questionnaire asked about each participant's gender, academic level, major, current GPA, first language, other foreign language learned, heritage learner status, and time spent in studying outside the classroom.

The motivation section consists of two major parts: reasons to learn the language

and overall motivation. Eight common reasons were identified in the literature and were given a scale of 1 to 6 for students to indicate how true each reason describes them. Some example items include: “Interest in the culture” and “Required to get the degree”. The four items in the overall motivation section were adopted from the mini version of the Attitude Motivation Test Battery (AMTB) designed by Gardner (1985, 1993). The full version of AMTB consists of a total of 104 Likert-type items designed to gauge subjects’ degree of motivation and attitude when learning a second language. The twelve (eleven for some versions, excluding “parental encouragement”) subscales make up the six sections (five for those versions that exclude “parental encouragement”) to measure integrativeness, attitudes toward the learning situation, motivation, language anxiety, instrumental orientation, and parental encouragement. The mini-AMTB is comprised of 12 items, each one corresponding to a subscale on the full AMTB. Of the twelve items, four that are closely related to overall motivation were selected for the current study.

The core of the questionnaire – the inventory of VLS, consists of 46 strategy statements that were derived mainly from the Vocabulary Learning Strategies Inventory (VOLSI, Stoffer, 1995) and Schmitt’s taxonomy (1997). In addition, a small number of items were taken from the Vocabulary Learning Questionnaire (VLQ Version 3, Gu & Johnson, 1996) and the Questionnaire of Chinese Vocabulary Learning Strategies (QCVLS, Liu, 2013). These 46 strategy statements were 5-point, Likert-type scale where students were asked to indicate how often they use each strategy: 1. *never or almost never*; 2. *seldom (once or twice a semester)*; 3. *sometimes (several times per semester)*; 4. *often (almost every week)*; and 5. *always or almost always (every time I study)*.

In order to accommodate students' different preferences in responding to the questionnaire, both an online version and a paper-copy version of the questionnaire were created. However, only the paper-version was used in the actual data collection process.

The development of the strategy inventory went through a process of selection of existing instruments, selection of items, peer review, pilot test, and editing.

Selection of Existing Instruments and Items

Reviewing the existing instruments available on VLS, Schmitt's (1997) taxonomy seemed to be more dominantly used. According to Takač (2008), this taxonomy is "currently the most comprehensive typology" of VLS. The strategy statements were derived from relevant research literature, learners' retrospective descriptions of their own strategies, and teacher's experiences. Schmitt proposed his two-dimension taxonomy of vocabulary learning strategies that distinguishes between discovery strategies and consolidation strategies and adopted four of the six categories in Oxford's taxonomy–social, memory, cognitive, and metacognitive strategies. He noted that there was no category in Oxford's system which adequately describes the kind of strategies used by an individual when faced with discovering a new word's meaning without recourse to another person's knowledge. Accordingly, he proposed the category of determination strategies to make his taxonomy more complete and suitable for categorizing vocabulary-specific strategies. Studies following Schmitt's taxonomy also contributed to the evidence of the validity and reliability. Cranbach's alphas of the four categories range from .69 to .77 in Kudo's (1999) study. Çelik and Toptaş (2010) reported a Cronbach's alpha of .84 in their study. Factor analyses were conducted to establish validity. The four categories in

Kudo's study had eigenvalues of 8.62, 6.75, 1.88, and 1.76, and accounted for 43.19% of the total variance.

As noted in the literature review section of this dissertation, some scholars have found several improvements to be made. For example, Liu (2013) pointed out that there is a large degree of overlap between the Discovery and Consolidation categories, as the researcher himself recognized. It is, therefore, difficult to interpret the extent to which the two categories of strategies are different from each other. Kudo (1999) mentioned that it is unclear as to whether the strategies classified into the five categories really share the common underlying factors. The statistical procedure of factor analysis was suggested as an indication of the validity of the questionnaire. In addition, some of the items use terms (e.g. Peg Method, Loci Method, and Keyword Method) that are not familiar with common students who lack the knowledge of such strategies. Therefore, these items were deleted in the item selection process.

Another existing instrument in the area of vocabulary learning strategy is the Vocabulary Learning Strategies Inventory (VOLSI), which is believed to be the first instrument specifically designed to measure VLS, developed by Stoffer in 1995. As Stoffer mentioned, all the items on the VOLSI evolved directly from the literature. Although Stoffer did not address her effort to avoid the issues of content underrepresentation construct irrelevancy, the in-depth review of related literature does give evidence of item content accuracy. Stoffer also mentioned that at the end of the instrument, respondents were asked to list any strategy they used for learning new vocabulary which had not been listed as an item on the measurement scale. Not a single additional item was received.

Therefore, Stoffer concluded that it was likely safe to assume that most areas of the theoretical construct had been covered in the instrument. In addition, the items of the instrument were reviewed by several experts in the area of foreign / second language learning. It is worth noticing that the chairperson of Stoffer's dissertation committee was Dr. Rebecca Oxford, who's among the first scholars that investigated foreign language learning strategies. Oxford's Strategy Inventory for Language Learning (SILL) is widely adopted by scholars in the studies of language learning strategies. It is reasonable to believe with the guidance of Oxford, the VOLSI's content relevance and representativeness should be examined in the test development process. In regard to reliability, Cronbach's alpha was used as the indicator in both pilot studies and the main study of Stoffer's, where the VOLSI was developed. The alphas were .86 and .76 in the two pilot studies, and .90 in the main study. The spectrum of the item-to-total correlations of the VOLSI reached from .19167 to .5, with the majority of items in the area of moderate to high correlations (.30 to .50). Using actual learner data and statistical procedures (i.e. exploratory factor analysis) instead of classifying the strategies beforehand to establish the categories is considered a step forward.

However, this survey suffered some flaws as pointed out by some researchers. For example, many items for a particular factor in VOLSI seem to be conceptually unrelated (Tseng, Domyei, & Schmitt, 2006). Some of the items are also somewhat outdated. Some example statements included: *I organize new words on my word processor* or *I record new words on a tape*. These items were either modified or excluded in the item selection stage. Still other items from the VOLSI were found to be somewhat repetitive. For example, items

48 to 51 are related to watch movies, read newspapers and magazines, read literature and poetry, and listen to radio programs. Those statements were combined as reading in foreign language and using foreign language media.

Besides the two major instruments described above, a small number of items were taken from other existing instruments such as the Vocabulary Learning Questionnaire (VLQ Version 3, Gu & Johnson, 1996) and the Questionnaire of Chinese Vocabulary Learning Strategies (QCVLS, Liu, 2013). The selection was based on the frequencies of use reported by the authors, the fitness of the integrity of the current instrument, and the interest of the author. Table 12 presents the number of items that were adopted from each instrument.

Table 12

The number of items adopted from each instrument

VLS inventory or measuring instrument	Number of items adopted
Schmitt's taxonomy, 1997	30
Stoffer's VOLSI, 1995	27
Liu's QCVLS, 2013	27
Gu and Johnson's VLQ, 1996	4

Note: Numbers of items do not add up to the number of the current survey – 46, because the items of these instruments overlap

Peer Review, Pilot Test, and Editing

After the tentative survey was created, it was sent to a survey research method expert, an applied linguistics expert, two writing tutors at the university writing center, and three foreign language instructors teaching different foreign languages. Opinions from each of these professionals were collected to refine the content of the current survey. A small number of items were modified to avoid misunderstanding and confusions. Meanwhile, some relevant statements were added and some

repetitive or confusing statements were removed as a result of the peer review.

A small pilot study was then conducted to ensure that the questionnaire cover the strategies relevant to learning foreign language vocabulary and that the students could understand the questionnaire easily. The time for completing the questionnaire was checked to make sure the length was acceptable. A small group of five students with status similar to the participants in the study was selected for the pilot study. Minor changes were made as a result of this pilot study.

Data Collection Procedures

Data collection took place in the spring semester of 2014 after the learners have been exposed to the target languages for at least two months to be familiar with the language and its vocabulary. Data were collected using the survey *Strategy Inventory of Foreign Language Vocabulary Learning*, paper-copy version.

Approval from Auburn University Institutional Review Board for the Protection of Human Subjects in Research (IRB) and the department head of Department of Foreign Languages and Literatures were obtained prior to data collection. Twelve foreign language instructors who were teaching thirty-four classes of Spanish, French, German, Italian, Chinese, and Japanese courses were contacted and informed about the research project and the intention of data collection. Instructors were asked about their preference of completing the survey in class or after class. Eight instructors agreed to have their students complete the survey in class, while four preferred to send out the survey in class and ask the students to bring back the next time. It took approximately 9 minutes to complete the survey. Immediately after each survey was collected, a unique participant

number was randomly assigned to each survey.

Data from the survey were coded and entered into an SPSS file (Version 21). After data-comparing and error-correcting in SPSS, the original paper surveys were destroyed. Stored data remained under the control of the researcher and shared only with university committee members responsible for the supervision of this study.

Data Analysis Procedures

To answer research question one, pertaining to the underlying factors of VLS, factor analyses were performed. Factor analysis is a statistical procedure where the researcher examines the covariation among a set of observed variables in order to gather information on their underlying latent constructs (i.e., factors) (Byrne, 2013). There are two basic types of factor analyses: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA is an exploratory mode to determine how, and to what extent, the observed variables are linked to their underlying factors (Byrne, 2013) whereas CFA is a confirmatory model to test the hypothesized structural model. As a way to uncover the underlying factors and propose a model to explain the relationships among observed variables, factor analysis is data-driven. The advantage is the respect to data, without overlooking theories – in order for a proposed model to be accepted, the theoretical soundness has to be addressed.

In the current study, exploratory factor analysis was performed to explore the underlying factor structure. Maximum likelihood was used as the extraction technique. Maximum likelihood calculates weights for the variables on the factors that maximize the probability of having sampled the correlation matrix from a multivariate normally

distributed population (Meyers, Gamst, & Guarino, 2012). The rotation method of Varimax was employed because correlations of factors were not assumed. The number of factors to be retained was determined by examining (1) the eigenvalues, (2) scree plot, (3) parallel analysis (Monte Carlo method), and taking into consideration related VLS models and principle of parsimony. One quick criterion for factor retention is Kaiser's rule -- to retain the number of factors whose eigenvalues are greater than 1. However, due to its "significant problems" (see Fabrigar et al., 1999 for a description of these problems), this method was suggested to use with caution. Therefore, other procedures were also used to determine the number of factors. Scree plots were examined, where factors' eigenvalues are plotted in descending order and the last substantial drop in the magnitude of the eigenvalues was identified. As a third method, parallel analysis, proposed by Horn (1965), was also applied. This approach is based on a comparison of eigenvalues obtained from sample data to eigenvalues one would expect to obtain from completely random datasets with the same characteristics (e.g. sample size, mean, standard deviation etc.). Eigenvalues of each random dataset were obtained and then averaged. The number of actual eigenvalues larger than the corresponding random eigenvalues mean indicates how many factors to retain (Tabachnick & Fidell, 2012). These three methods, together with related theories and the concern of parsimony, served as the basis to determine the number of factors to retain in the current study.

To address research questions two and three, a series of t-tests and Analyses of Variance (ANOVA) were performed to find out the differences in strategy use (a) between alphabet-based language group and character-based language group, (b) between male

students and female students, (c) between beginning and intermediate level students, (d) students from different majors, (e) between heritage learners and non-heritage learners, and (f) students in different academic levels. The assumptions of homogeneity of variances for each ANOVA procedure were assessed using Levene's test provided by SPSS program. Whenever a statistical significance was found among more than two groups, a post-hoc test (multiple comparisons of groups) was conducted to find out where the difference lies. Correlation coefficients of VLS use and other continuous variables such as motivation, vocabulary study time, and GPA were obtained to find out the relationship between VLS use and each variable.

A multiple regression was also conducted to further discover the relationships between strategy use and the various predicators. Backward elimination method was used instead of sequential regression (also referred to as hierarchical regression) because it was not crystal clear in what order the independent variables should be entered in the equation. Although literature suggests that motivation is the "strongest" predictor of strategy use, the order of other predictors was not obvious. Therefore, it is reasonable to leave the order of entry based solely on statistical criteria using a stepwise method. R^2, which is the squared correlation between each independent variable and the dependent variable, was employed to determine how much variance of the dependent variable was accounted for by an independent variable. R^2 change, was used to determine the change of R^2 by deleting an independent variable. The standardized beta weight of each retained independent variable was examined to determine the contribution of each independent variable in explaining the variance of the dependent variable. The unstandardized beta

weight was also reported to form the regression equation.

Descriptive statistics (i.e. frequency, mean, standard deviation) were examined throughout the aforementioned analyses to display major characteristics of the variables. The alpha level of .05 was used as the criterion to determine statistical significances.

Chapter 4

RESULTS

The purpose of the present study included: (a) to uncover the underlying factors of foreign language vocabulary learning strategies, taking both alphabet-based languages (ABL) and character-based languages (CBL) into consideration; (b) to describe VLS use and examine the differences in frequency of VLS use between the two groups; (c) to identify the effects of gender, college major, motivation and other variables on VLS use. The following research questions were attempted to answer:

1. What are the underlying factors/categories of foreign language vocabulary learning strategies?
2. How students learning alphabet-based languages and students learning character-based languages use vocabulary learning strategies differently?

   2.1 Are there differences in frequency of VLS use between ABL learners and CBL learners?

   2.2 Are there differences in the types of VLS used by ABL learners and CBL learners?
3. How do variables such as gender, major, motivation influence the use of vocabulary learning strategies?

In order to address the purpose and answer the research questions, collected data were entered, screened, and analyzed. Results from data analyses were obtained and are presented in this chapter.

Preliminary Analyses

Before major analyses were conducted, descriptive statistics were obtained and preliminary analyses were conducted to examine the characteristics of the variables.

Descriptive Statistics

For nominal variables of gender, major, academic level, language course, course level, and heritage learner status, frequency distribution and percentage of each group were obtained. They are presented in Table 13 and Table14.

Of all 492 participants, about half (46.3%) were enrolled in Spanish classes. The breakdown of alphabet-based languages group and character-based languages group was 411 (83.5%) versus 81 (16.5%). 41.3% of the participants were male and 58.5% were female. About half (56.3%) of the students were in a major in the area of humanity or liberal art (including 4.9% majored in language), while the other half in science, engineering, and business. Almost all of the participants were undergraduate students, with only 4 exceptions (.8%). Over three fourths (78.7%) of the students were at beginning level and majority (96.3%) of students were non-heritage learners. Distributions of each group of these variables were also broken down by the two language groups (ABL and CBL) and statistics are also presented in Table 14.

Table 13

Frequency distribution of each language

Target Language	N	%
Character-based Language (CBL)	**81**	**16.5**
Chinese	49	10.0
Japanese	32	6.5
Alphabet-based Language (ABL)	**411**	**83.5**
French	94	19.1
German	34	6.9
Italian	55	11.2
Spanish	228	46.3
Total	492	100

Table 14

Frequency distribution of each demographic group

Demographic variable	*N*	%	CBL(%)		ABL(%)	
Gender						
Male	203	41.3	48	(59.3)	155	(37.8)
Female	288	58.5	33	(40.7)	255	(62.2)
Total	491	99.8	81	(100)	410	(100)
Major						
Science	94	19.1	16	(17.0)	78	(83.0)
Engineering	46	9.3	18	(39.1)	28	(60.9)
Humanity/Liberal Art	253	51.4	26	(10.3)	227	(89.7)
Language	24	4.9	3	(12.5)	21	(87.5)
Business	70	14.2	17	(24.3)	53	(75.7)
Total	487	99	80	(16.4)	407	(83.6)
Academic Level						
Freshman	106	21.5	9	(11.3)	97	(23.8)
Sophomore	178	36.2	27	(33.8)	151	(37.1)
Junior	116	23.6	24	(30.0)	92	(22.6)
Senior	83	16.9	18	(22.5)	65	(16.0)
Graduate	4	.8	2	(2.5)	2	(.5)
Total	487	99	80	(100)	407	(100)
Course Level						
Beginning	387	78.7	56	(69.1)	331	(80.5)
Intermediate	105	21.3	25	(30.9)	80	(19.5)
Total	492	100	81	(100)	411	(100)
Heritage Learner Status						
Heritage learner	18	3.7	2	(2.5)	16	(3.9)
Non-heritage learner	474	96.3	79	(97.5)	395	(96.1)
Total	492	100	81	(100)	411	(100)

Note. Percentages may not add up to 100 due to missing data.

Descriptive statistics of GPA and motivation are presented in Table 14. The GPA of these students ranged from 1.4 to 4.0, with a mean of 3.24 and a standard deviation of .51. A mean score of the four motivation items was obtained for each participant. It ranged from 1 to 6, with a mean of 4.71 and a standard deviation of 1.11. Independent samples t-tests were conducted to examine the mean differences between the two groups. Results, as shown in Table 15, indicated that CBL students had a significantly higher GPA than their ABL peers, with a small effect size ($t_{(481)}$=2.08, p=.038, d=.26) and they were significantly more motivated as well ($t_{(175.34)}$=6.35, p<.001, d=.57).

Table 15

Comparisons of GPA and motivation between CBL and ABL group

	CBL			ABL						Cohen's
	N	M	SD	N	M	SD	t	df	*p*	*d*
GPA	77	3.35	.48	406	3.22	.51	2.08	481	.038	.26
Motivation	81	5.23	.71	405	4.61	1.15	6.35	175.34	<.001	.57

In regards to time spent studying vocabulary and other aspects of the foreign language, medians and modes were obtained and are presented in Table 16. The values of responses in these two questions were coded from 1 to 8, for 0-15 minutes to more than 120 minutes, with 15 minutes as the interval. For example, the response of "0-15 minutes" was coded as 1; "16-30 minutes" as 2; "31–45 minutes" as 3; so forth; and "more than 120 minutes" as 8. Independent-sample T-tests were conducted to examine the mean differences in study time between the two language groups. Results, as presented in Table 17, showed that CBL students spent significantly more time studying the language, both vocabulary and other aspects, than ABL students. ($t_{(99.98)}$=4.80, p<.001, d=.69; $t_{(99.83)}$=.82, p<.001, d=.12)

Table 16

Descriptive statistics of study time

Variable	N	Median	Mode
Time spent studying vocabulary	491	31 to 45 minutes	16 to 30 minutes
Time spent studying other aspects	492	31 to 45 minutes	16 to 30 minutes

Table 17

Comparisons of study time between CBL and ABL group

	CBL			ABL						Cohen
	N	M	SD	N	M	SD	t	df	*p*	's *d*
Time on vocab	81	4.19	2.06	410	3.02	1.60	4.80	99.98	<.001	.69
Time on other	81	3.21	2.23	411	3.00	1.73	.82	99.83	<.001	.12

Reliability

One common way to examine internal consistency reliability is to acquire Cronbach's Alphas. The alpha value for the four motivation items was .91, which is considered strong. The alpha value of the forty-six strategy statements was .88.

Research question one

To answer the first research question -- what are the underlying factors/categories of foreign language vocabulary learning strategies – exploratory factor analyses were conducted. Maximum Likelihood was utilized as the extraction method and Varimax, an orthogonal rotation, was selected as the rotation method, not assuming correlations between factors.

Although the original intent was to analyze the six language groups together and reach a universal solution, an EFA was conducted for each language group to ensure the data do not behave differently across different language groups. The results from these six factor analyses revealed that the structure of VLS of CBL students was somewhat different from that of ABL students. Therefore, CBL group and ABL group were analyzed separately to examine closely the underlying structures.

Results for CBL Group

A cut-off point of .35 for factor loadings was used to determine the inclusion of items in a factor. Table 18 presents factor loadings of each strategy item on each factor, with loadings that were lower than .20 suppressed. Factor loadings higher than .35 are in bold. When one item loaded on more than one factor, the item was categorized into only one factor, normally the one with the higher loading. Four strategies (items 30, 37, 38, and 42) that students seldom used (with average frequency score lower than 1.90 and standard deviation smaller than 1) were excluded from factor analysis.

Table 18

Factor loadings for CBL group

#	Strategy	Factor				
		1	2	3	4	5
1	I connect a new word to a word in my L1.				.221	
2	I connect a new word to words I already know.	.241		**.535**		
3	I connect a new word to synonyms /antonyms.			**.556**		
4	I connect a new word to a personal experience.	.345	.285			.331
5	I connect a new word to its location on a page or the occasion where I saw it.					
6	I group new words by topic or part of speech.			**.492**		.401
7	I group words that share the same parts.			**.699**		
8	I group words together within a storyline.	**.427**				.331
9	When I meet an unknown word, I use a dictionary.					.257
10	When I meet an unknown word, I ask.		.280	.215		
11	When I meet an unknown word, I guess.					.232
12	I learn easy words first.	.211	-.261			**.374**
13	I learn the words in a(n) sentence/idiom together.	.341			-.439	
14	Besides the meaning, I pay attention to use.		.302	**.430**	-.533	
15	I pay attention to the sample sentences when I look up a word in a dictionary.		**.369**		-.267	.396
16	I say a new word aloud when studying.	**.749**		.348		-.290
17	I visualize the spelling/shape of a word.	**.483**				.217
18	I picture the meaning of the word.	**.563**				.260
19	I use physical actions or act out the word.	**.612**	.236			
20	I use prefix/suffix/root/radical to help memorize.			**.569**		
21	I take notes in class.		.341	.259		.293
22	I keep a vocabulary notebook.		.263		.318	**.522**
23	I test myself or have others test me on new words.	.254	.215			
24	I use brainstorming to recall new words from the same topic.	.366				**.477**
25	I listen to the sound of the word repeatedly.	**.458**		.307		
26	I write new words repeatedly.	.231	-.261	.222		
27	I repeat a new word aloud several times.	**.793**		.332	.373	
28	I use rhymes.	**.488**	.211			
29	I use word lists.				.286	**.499**
31	I arrange words on a page to group them or to form a pattern.					**.423**
32	I use flash cards.				**.577**	
33	I use a flash cards app on my phone or computer.				**.650**	.300
34	I play vocabulary games on phone or computer.		.315		**.573**	
35	I read foreign language books/newspapers.		**.602**			
36	I use foreign language media.		**.605**			
39	I practice by interacting with others.		**.568**		-.259	
40	I make up sentences using newly learned words.	.339	**.581**	.267	-.250	
41	I write notes, messages, or emails to practice.		**.761**			
43	I discuss with others about the methods or strategies of memorizing words.	.227		.217		

44	I plan my schedule so I will have enough time to study the vocabulary.		**.540**	
45	I notice the mistakes I made when using words and use that information to help me do better.	.278	**.472**	-.281
46	I skip or pass new words when I read foreign language materials.			

Note: Strategy items in this table are the shortened. For complete items, see Appendix A.

The results from CBL group showed that as many as fourteen factors' initial eigenvalues were greater than one. After rotation, these fourteen factors accounted for 61.99% of total variance. Scree plot, as shown in Figure 1, suggested a 5-factor or an 8-factor solution that accounted for 36.33% and 46.90% of the total variance, respectively. For the sake of parsimony, a 5-factor solution was adopted. Consequently, 30 items loaded on the five factors. Cronbach's alpha for the 30-item scale was .825. A summary of the five factors including percentage of total variance accounted for, and internal consistency of the factor is presented in table 19.

Figure 1. Scree plot of CBL group

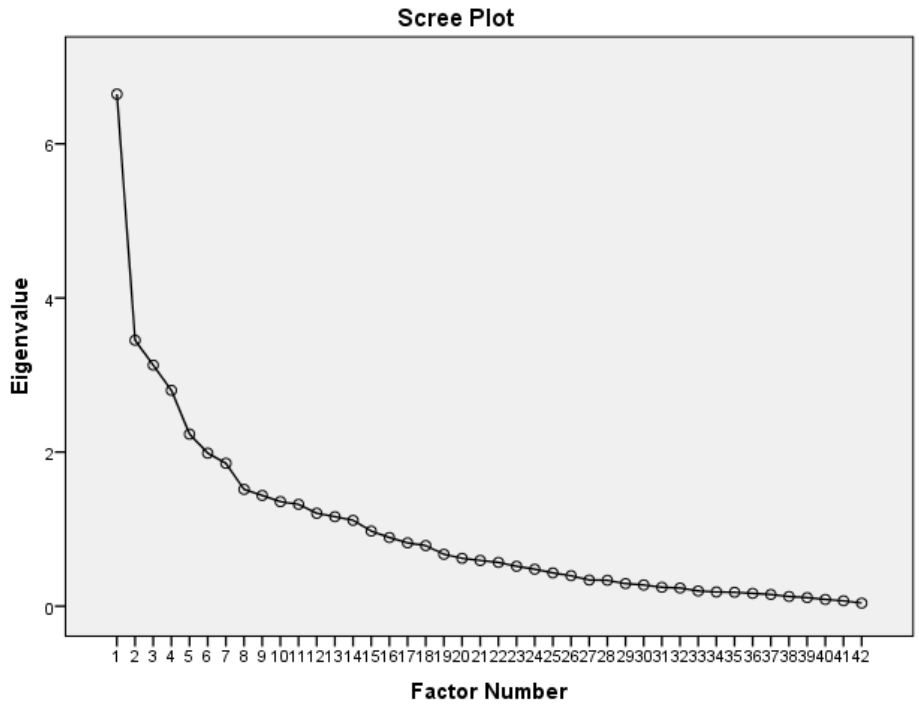


Table 19

Summary of factors for CBL group

Factor	Factor name	# of items	Eigenvalues	% of variance	Cronbach's alpha
1	Sensory/physical strategies	8	3.775	8.988	.809
2	Genuine language use	6	3.267	7.778	.775
3	Cognitive/metacognitive strategies	8	3.266	7.777	.771
4	Flashcards and games	3	2.502	5.957	.649
5	Massive input/output	5	2.450	5.832	.622
Total		30		36.332	.831

The first factor, sensory/physical strategies, accounted for 8.99% of the total variance. It consisted of eight items, whose loadings ranged from .427 to .793. These strategies involve students using visual/auditory assistance and physical actions for word retention. Some examples of these strategies include: (a) saying the words aloud when studying, (b) visualizing the spelling or shape of the word, (c) picturing the meaning, (d) listening and saying words aloud repeatedly, (e) using physical actions, and (f) using rhymes. Cronbach's alpha for this eight-item subscale was .809. Table 20 shows the eight items and their loadings on Factor 1.

Table 20

Factor 1 of CBL group

Item	Strategy	Loading
27	I repeat a new word aloud several times.	.793
16	I say a new word aloud when studying.	.749
19	I use physical actions or act out the word to help me remember it.	.612
18	I picture the meaning of the word.	.563
28	I use rhymes.	.488
17	I visualize the spelling/shape of a word.	.483
25	I listen to the sound of the word repeatedly.	.458
8	I group words together within a storyline.	.427

Six items loaded on the second factor, which accounted for 7.78% of the total variance. Factor loadings ranged from .369 to .761. These items described the ways in

which students engaged in using the words in real-life situations such as writing messages or emails, reading in foreign languages, using foreign language media and interacting with others to practice. Putting the words in use, students shift the focus from vocabulary itself to the functional aspect of words. Since five of the six items were overlapped with Stoffer's factor *genuine language use*, this factor was given the same name. Cronbach's alpha for this six-item subscale was .775. These six items of Factor 2 are presented in Table 21.

Table 21

Factor 2 of CBL group

Item	Strategy	Loading
41	I write notes, messages, or emails to practice new words.	.761
36	I use foreign language media (songs, movies, radio programs, newscasts, etc.).	.605
35	I read foreign language books, newspapers, magazines.	.602
40	I make up sentences using newly learned words.	.581
39	I practice using the words by interacting with others.	.568
15	I pay attention to the sample sentences when I look up a word in a dictionary.	.369

The third factor was loaded by eight items whose factor loadings ranged from .430 to .699. It accounted for 7.78% of total variance. These strategies are cognitive and metacognitive strategies that require a higher level of mental processing. For example, some strategies involve students (a) grouping new words by topic or part of speech, or by similar features; (2) connecting new words to synonyms and antonyms, to familiar words, or to L1 words; and (3) using word features (such as prefix, suffix and root) to assist memorization. Other strategies involve metacognitive strategies such as planning schedule to study vocabulary and learning from mistakes. Cronbach's alpha for this factor was .771. A list of items of Factor 3 and item loadings are presented in Table 22.

Table 22

Factor 3 of CBL group

Item	Strategy	Loading
7	I group words that share the same parts (prefix, suffix, or root; or radicals).	.699
20	I use prefix, suffix, root, or radical to help me memorize.	.569
3	I connect a new word to its synonyms and antonyms.	.556
44	I plan my schedule so I will have enough time to study the vocabulary.	.540
2	I connect a new word to words I already know.	.535
6	I group new words by topic or part of speech (food, numbers, nouns, verbs).	.492
45	I notice the mistakes I made when using words and use that information to help me do better.	.472
14	Besides the meaning of a word, I pay attention to how to use it.	.430

Consisting of only three items, the fourth factor accounted for 5.83% of the total variance. It involved using flashcards, both actual cards and virtue cards on phones or computers, and using vocabulary games. Factor loadings of these three items ranged from .573 to .650. Cronbach's alpha for this factor was .649. Items of Factor 4 and their loadings are presented in Table 23.

Table 23

Factor 4 of CBL group

Item	Strategy	Loading
33	I use a flash cards app on my phone or computer.	.650
32	I use flash cards.	.577
34	I play vocabulary games on my phone or computer.	.573

It is worth mentioning here when developing the current VLS survey, the author did not combine item 32 and item 33, both about flashcard use, in the hope of finding out whether students differed in using the "old-fashioned" flashcards and the "high-tech" flashcards. A paired sample t-test was conducted on both language groups to answer this question and a significant difference was found, as shown in Table 24. Clearly, more students still preferred the "old-fashioned" flashcards over the "high-tech" flashcards ($t_{(490)}$=8.91, p<.001, d=.40).

Table 24

Comparison between use of "old-fashioned" and "high-tech" flashcards use (item 32 and item 33)

	Mean		t	df	*p*	Cohen's *d*
	Cards	Apps				
Flashcards	3.13	2.52	8.912	490	<.001	.40

The fifth factor consisted of five strategies that do not deal with individual words. Rather, students use word lists, or arrange words on a page, or brainstorm to recall a group of words. Therefore, this factor was given the name of *massive input/output*. This factor accounted for 5.96% of the total variance and factor loadings ranged from .374 to .522. Cronbach's alpha for this five-item subscale was .622. A summary of Factor 4' items and their loadings is presented in Table 25.

Table 25

Factor 5 of CBL group

Item	Strategy	Loading
22	I keep a vocabulary notebook.	.522
29	I use word lists.	.499
24	I use brainstorming to recall new words from the same topic.	.477
31	I arrange words on a page to group them or to form a pattern.	.423
12	I learn easy words first.	.374

In regards to frequency of use, a repeated measure ANOVA was conducted to explore differences in average use of the five categories of strategies. Since result from the assumptions test for sphericity indicated that sphericity could not be assumed (Mauchly's $W_{(9)}$=.772, p=.016), the Huynh-Feldt method was used to test for mean differences. Results indicated there were significant differences among the five factors in their frequency of use by students ($F_{(3.707, 296.529)}$=33.48, p<.001, η^2=.295), as shown in Table 26 and Table 27.

Table 26

Means and standard deviations of average use of CBL strategy categorizes

	Factor	M	SD
Factor 1	Sensory/physical strategies	3.17	.74
Factor 2	Genuine language use	2.92	.88
Factor 3	Cognitive/metacognitive strategies	3.42	.68
Factor 4	Flashcards and games	2.20	.94
Factor 5	Massive input/output	2.73	.77

(N=81)

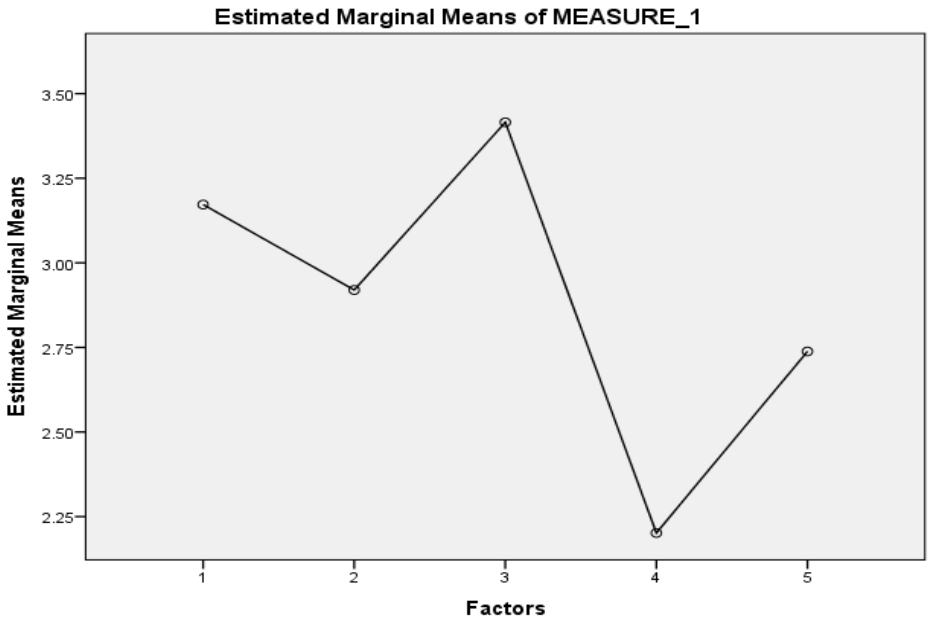
Table 27

Differences in average use of the five categories of strategies for CBL students

	SS	df	MS	F	*p*	η^2
Five Factors	69.120	3.707	18.648	33.484	<.001	.295
Error	165.143	296.529	.557			

Results from follow-up multiple comparisons showed Factor 4 was used significantly less often than other four factors and Factor 3 and Factor 1 were used significantly more often than Factors 4 and 5. Figure 2 presents the mean plot of average use of the five categories by CBL students.

Figure 2. Comparison of VLS use for the five categories of CBL group



Results for ABL Group

Similar to CBL group, .35 was used as a cut-off point of factor loadings. Table 28 presents factor loadings of each item on each factor, with loadings that were lower than .20 suppressed. Factor loadings higher than .35 are bolded. When one item loaded on more than one factor, the item was categorized into only one factor, normally the one with the higher loading. Three strategies (items 30, 37, and 38) that students seldom used (with average frequency score lower than 1.90 and standard deviation smaller than 1) were excluded from factor analysis.

Table 28

Factor loadings for ABL group

#	Strategy	Factor			
		1	2	3	4
1	I connect a new word to a word in my L1.				**.706**
2	I connect a new word to words I already know.				**.713**
3	I connect a new word to its synonyms and antonyms.	.219			**.462**
4	I connect a new word to a personal experience.	**.395**			.217
5	I connect a new word to its location on a page or the occasion where I saw it.				
6	I group new words by topic or part of speech.				**.393**
7	I group words that share the same parts.	.308			**.364**
8	I group words together within a storyline.	**.453**			
9	When I meet an unknown word, I use a dictionary.				
10	When I meet an unknown word, I ask.	.257	.220		
11	When I meet an unknown word, I guess.				.221
12	I learn easy words first.				
13	I learn the words in a(n) sentence/idiom together.	**.372**			.259
14	Besides the meaning of a word, I pay attention to how to use it.	.281			**.456**
15	I pay attention to the sample sentences when I look up a word in a dictionary.	.266		.222	.280
16	I say a new word aloud when studying.			**.675**	
17	I visualize the spelling/shape of a word.			**.354**	.236
18	I picture the meaning of the word.	.217		.344	
19	I use physical actions or act out the word.	.214	.203	.340	
20	I use prefix, suffix, root, or radical to help me memorize.	.330			**.355**
21	I take notes in class.		.288		
22	I keep a vocabulary notebook.	.200	**.510**		
23	I test myself or have others test me on new words.		**.462**	.279	
24	I use brainstorming to recall new words from the same topic.	.344			.245
25	I listen to the sound of the word repeatedly.	.271		**.597**	
26	I write new words repeatedly.		.381	**.487**	

27	I repeat a new word aloud several times.			**.854**	
28	I use rhymes.	.266	.295	.255	
29	I use word lists.		**.408**	.244	
31	I arrange words on a page to group them or to form a pattern.	.211	**.361**		
32	I use flash cards.		**.630**		
33	I use a flash cards app on my phone or computer.		**.617**		
34	I play vocabulary games on my phone or computer.		**.548**		
35	I read foreign language books, newspapers, magazines.	**.607**			
36	I use foreign language media.	**.593**			
39	I practice using the words by interacting with others.	**.623**		.208	
40	I make up sentences using newly learned words.	**.651**			
41	I write notes, messages, or emails to practice new words.	**.558**			
42	I schedule review sessions to review the words I have learned.	.309	.334		
43	I discuss with others about the methods or strategies of memorizing words.	**.419**	.348		
44	I plan my schedule so I will have enough time to study the vocabulary.		**.434**	.224	
45	I notice the mistakes I made when using words and use that information to help me do better.	.221		.257	.292
46	I skip or pass new words when I read foreign language materials.				

Note: Strategy items in this table are the shortened. For complete items, see Appendix A.

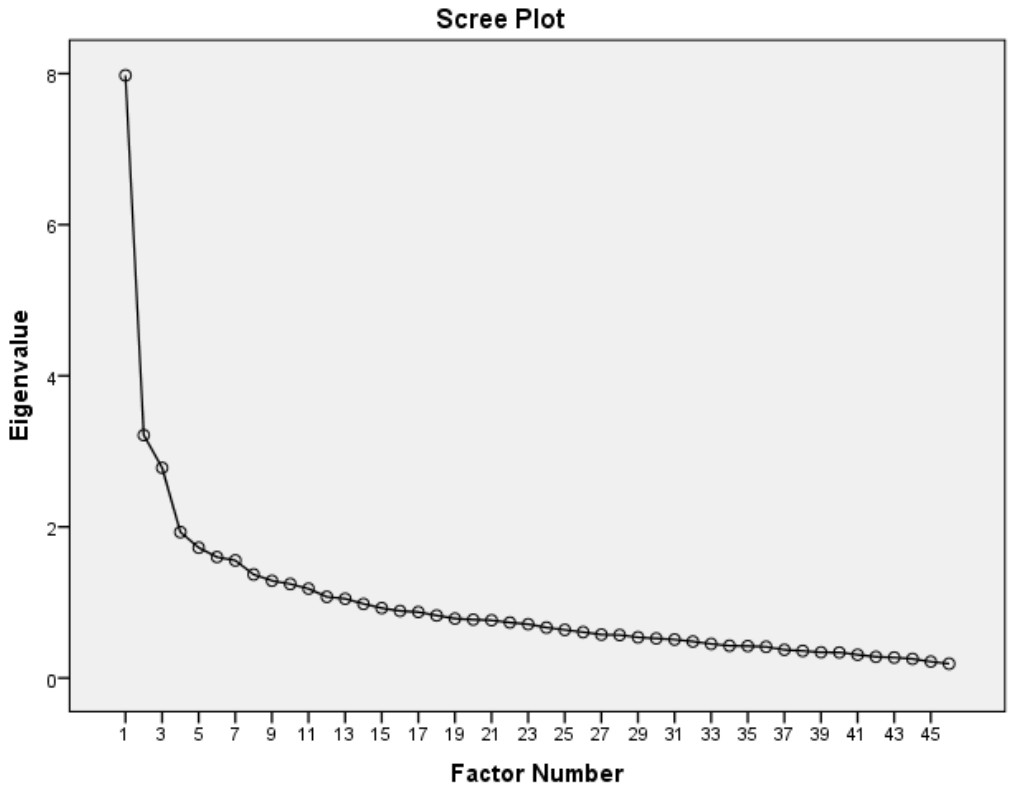
The results from ABL group showed as many as thirteen factors' initial eigenvalues were higher than one. After rotation, eleven factors' eigenvalues were greater than one and they cumulatively accounted for 46.69% of the total variance. Scree plot, as shown in Figure 3, suggested a 4-factor solution that accounted for 28.50% of the total variance. Results showed that 29 items loaded on the four factors. Cronbach's alpha for the 29-item scale was .857. Table 29 presents a summary of the four factors including percentage of total variance accounted for, and internal consistency of the factor.

Table 29

Summary of factors for ABL group

Factor	Factor name	# of items	Eigenvalues	% of variance	Cronbach's alpha
1	Putting words in context	9	3.725	8.662	.796
2	Utilizing external resources	8	3.005	6.988	.753
3	Using sensory assistance	5	2.896	6.735	.761
4	Making associations	7	2.631	6.118	.709
Total		29		28.50	.857

Figure 3. Scree plot of ABL group



The first factor, accounting for 8.66% of the total variance, consisted of nine items whose loadings ranged from .372 to .651. Five out of the nine items were overlapped with Factor 2 of CBL group, *genuine language use*. The other four items that were not overlapped, included items 4, 8, 13, and 43. These nine strategies involve putting words into context instead of solely focusing on the word itself. Cronbach's alpha for this nine-item subscale was .796. The items and factor loadings are presented in Table 30.

Table 30

Factor 1 of ABL group

Item	Strategy	Loading
40	I make up sentences using newly learned words.	.651
39	I practice using the words by interacting with others.	.623
35	I read foreign language books, newspapers, magazines.	.607
36	I use foreign language media (songs, movies, radio programs, newscasts, etc.).	.593
41	I write notes, messages, or emails to practice new words.	.558
8	I group words together within a storyline.	.453

43	I discuss with others about the methods or strategies of memorizing words.	.419
4	I connect a new word to a personal experience.	.395
13	I learn the words in a(n) sentence/idiom together.	.372

Factor 2 of ABL group accounted for 6.99% of the total variance. It consisted of eight items whose loadings ranged from .361 to .630. It's not hard to notice that Factor 2 of ABL groups appeared to be a combination of Factor 4 and Factor 5 of CBL groups, consisting of strategies related to utilizing resources such as flashcards (and flashcard apps), vocabulary games, a notebook, word lists, paper to arrange words for patterns etcetera. Cronbach's alpha for this subscale was .753. Table 31 presents the strategies and factor loadings of Factor 2.

Table 31

Factor 2 of ABL group

Item	Strategy	Loading
32	I use flash cards.	.630
33	I use a flash cards app on my phone or computer.	.617
34	I play vocabulary games on my phone or computer.	.548
22	I keep a vocabulary notebook.	.510
23	I test myself or have others test me on new words outside of class.	.462
44	I plan my schedule so I will have enough time to study the vocabulary.	.434
29	I use word lists.	.408
31	I arrange words on a page to group them or to form a pattern.	.361

Accounting for 6.74% of total variance, Factor 3 was loaded by five items including items 16, 17, 25, 26, and 27, whose loadings ranged from .354 to .854. Similar to Factor 1 of CBL group, this factor involves sensory strategies such as saying words aloud, visualizing the spelling/shape, listening to the sound, writing repeatedly, and repeating the words aloud. *Using physical actions* was not included. Therefore, *using sensory assistance* was given as the factor name. Cronbach's alpha for this subscale was .761. A summary of Factor 3 and its items is presented in Table 32.

Table 32

Factor 3 of ABL group

Item	Strategy	Loading
27	I repeat a new word aloud several times.	.854
16	I say a new word aloud when studying.	.675
25	I listen to the sound of the word repeatedly.	.597
26	I write new words repeatedly.	.487
17	I visualize the spelling/shape of a word.	.354

Seven items loaded on Factor 4, which accounted for 6.12% of the total variance. The factor loadings ranged from .355 to .713. Six of the seven items overlapped with Factor 3 of the CBL group. These strategies involved students making associations when learning vocabulary. Students relate new words to synonyms or antonyms, or to the equivalent in their first language, or to the words that are already known. Students also group words by topic or part of speech, or group words that share the same parts. In addition, students link a word to its usage and use information of prefix, suffix, root, or radical to help memorize. The six items and their loadings are presented in Table 33.

Table 33

Factor 4 of ABL group

Item	Strategy	Loading
2	I connect a new word to words I already know.	.713
1	I connect a new word to a word in my first language (cognate or similar sound).	.706
3	I connect a new word to its synonyms and antonyms.	.462
14	Besides the meaning of a word, I pay attention to how to use it.	.456
6	I group new words by topic or part of speech (food, numbers, nouns, verbs).	.393
7	I group words that share the same parts (prefix, suffix, or root; or radicals).	.364
20	I use prefix, suffix, root, or radical to help me memorize.	.355

Regarding frequency of use, a repeated measure ANOVA was conducted to explore differences in average use of the four categories of VLS. Table 34 presents the means and standard deviations of the average score of VLS use for the four strategy categories.

Since result from the assumptions test for sphericity indicated that sphericity could not be assumed (Mauchly's $W_{(9)}$=..908, p<.001), the Huynh-Feldt method was used to test for mean differences . Results indicated there were significant differences among the four categories in their frequency of use by students ($F_{(2.862, 1173.439)}$=261.853, p<.001, η^2=.39), as shown in Table 35.

Table 34

Means and standard deviations of average use of ABL strategy categorizes

	Factor	M	SD
Factor 1	Putting words in contexts	2.36	.70
Factor 2	Utilizing external resources	2.63	.83
Factor 3	Using sensory assistance	3.10	.91
Factor 4	Making associations	3.52	.62

(N=411)

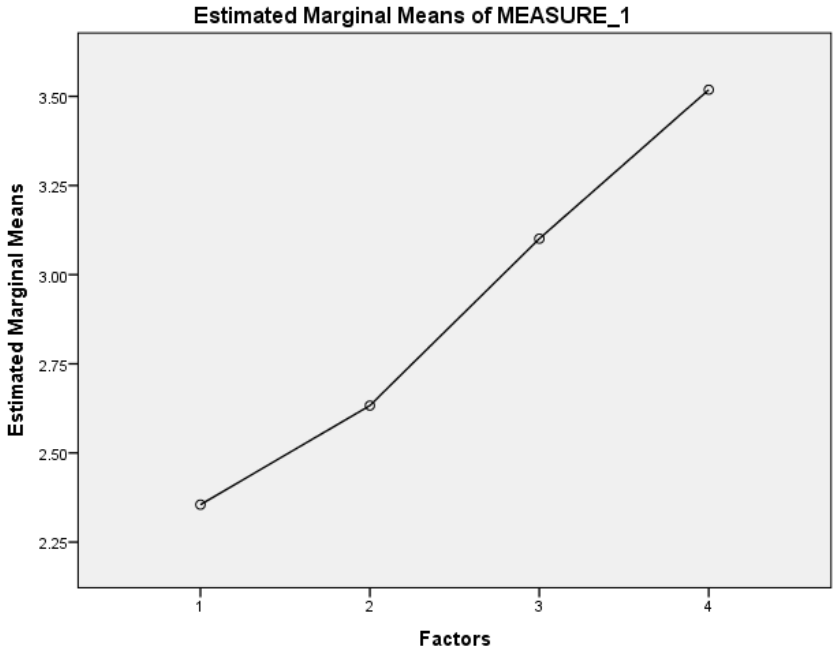
Table 35

Differences in average use of the five categories of strategies for ABL students

	SS	df	MS	F	*p*	η^2
Four Factors	325.264	2.862	113.647	261.853	<.001	.390
Error	509.288	1173.439	.434			

Results from multiple comparisons showed significant differences between all four factors. As presented in Figure 4, the use frequency of the four strategy categories was in ascending order from Factor 1 to Factor 4. Factor 4, *making associations,* was favored by ABL students, as the most popular category, followed by *using sensory assistance* and *utilizing external resources*. Although accounting for most total variance out of the four factors, Factor 1, *putting words in context* was used least often by ABL students.

Figure 4. Comparison of VLS use for the five categories of ABL group



Research Question Two

The second research question involved how students learning alphabet-based languages and those learning character-based languages are different in their use of strategies. This research question can be further broken down into two questions: (1) how are the two language groups of students different in average use of VLS overall? and (2) how are the two groups different in the use of individual strategies?

The first focus was on the difference in average VLS use overall between the two language groups. A one-way ANOVA was conducted and results, as shown in Table 36, indicated that on average, CBL students use VLS significantly more than their ABL peers ($F_{(1, 491)}$=4.099, p=.043, η^2=.008). The overall VLS use scores were obtained by averaging the scores of all 46 strategy items. Therefore, average VLS use had a highest possible score of 5 and lowest of 1.

Table 36

One-way ANOVA between CBL students and ABL students in overall VLS use

	CBL students		*ABL students*				
	M	SD	M	SD	F(1,490)	*p*	η^2
Overall VLS use	2.93	.44	2.81	.47	4.099	.043	.008

The second part of research question two zooms in to individual strategy level to investigate whether CBL students and ABL students preferred some strategies over the others. Table 37 and table 38 highlighted the most frequently used strategies of ABL students and CBL students.

Table 37

Most frequently used strategies by CBL students

Item no.	Strategies	Mean	SD
9	When I meet an unknown word, I use a dictionary (including phone app and online dictionary) to look up its meaning.	4.16	1.08
17	I visualize the spelling/shape of a word.	3.95	1.15
26	I write new words repeatedly.	3.91	1.16
2	I connect a new word to words I already know.	3.88	.97
16	I say a new word aloud when studying.	3.88	1.04
14	Besides the meaning of a word, I pay attention to how to use it.	3.88	.93
45	I notice the mistakes I made when using words and use that information to help me do better.	3.80	.92
27	I repeat a new word aloud several times.	3.72	1.22
15	I pay attention to the sample sentences when I look up a word in a dictionary.	3.72	1.09
12	I learn easy words first.	3.56	1.15

Table 38

Most frequently used strategies by ABL students

Item no.	Strategies	Mean	SD
9	When I meet an unknown word, I use a dictionary (including phone app and online dictionary) to look up its meaning.	4.26	.98
1	I connect a new word to a word in my first language (cognate or similar sound).	4.01	.89
2	I connect a new word to words I already know.	3.99	.87
6	I group new words by topic or part of speech (food, numbers, nouns, verbs).	3.81	1.03

12	I learn easy words first.	3.77	1.09
14	Besides the meaning of a word, I pay attention to how to use it.	3.61	.97
21	I take notes in class.	3.48	1.39
15	I pay attention to the sample sentences when I look up a word in a dictionary.	3.43	1.19
16	I say a new word aloud when studying.	3.39	1.26
45	I notice the mistakes I made when using words and use that information to help me do better.	3.33	1.07

The strategy of dictionary use (Item 9, "When I meet an unknown word, I use a dictionary to look up its meaning.") is ranked as the most popular strategy among the students from both language groups. Other six strategies were also ranked high in the most used list for both languages, which were connecting to old words (Item 2, "I connect a new word to words I already know."), attention to word usage (Item 14, "Besides the meaning of a word, I pay attention to how to use it."), say aloud (Item 16, "I say a new word aloud when studying."), easy words first (Item12"I learn easy words first."), sample sentences (Item 15, "I pay attention to the sample sentences when I look up a word in a dictionary."), and notice mistakes (Item 45, "I notice the mistakes I made when using words and use that information to help me do better.").

ABL students frequently connect new words to their first language (Item 1 "I connect a new word to a word in my first language (cognate or similar sound)."), and group new words by topic or part of speech (Item 6, "I group new words by topic or part of speech (food, numbers, nouns, verbs).")

Unique to CBL students, on the other hand, strategies of visualization (Item 17, "I visualize the spelling/shape of a word."), and repeatedly writing (Item 26, "I write new words repeatedly.") were ranked very high in the list of most used strategies.

To confirm that the strategies that were uniquely higher ranked by one group were in fact more frequently used, a series of independent-sample t-tests were conducted. Table 39 summarizes the findings of these t-tests. ABL students connect new words to

words in their first language and group new words by topic or part of speech significantly more often than their CBL peers ($t_{(95.53)}$=-5.38, p<.001, d=.82; $t_{(106.4)}$=-3.11, p=.002, d=.41). Meanwhile, CBL students use visualization and written repetition significantly more often than ABL students ($t_{(119.11)}$=4.70, p<.001, d=.55; $t_{(125.26)}$=8.17, p<.001, d=.91).

Table 39

Comparisons between CBL and ABL students in four most used strategies

	Levene's Test for Equality of Variances		t	df	*p*	Cohen's *d*
	F	*p*				
VLS 1	24.663	<.001	-5.384	95.55	<.001	.82
VLS 6	5.085	.025	-3.110	106.40	.002	.41
VLS 17	5.024	.025	4.701	119.11	<.001	.55
VLS 26	5.138	.024	8.171	125.26	<.001	.91

In regards to the least frequently used strategies of CBL students and ABL students, Table 40 and Table 41 present lists of ten least-used strategies for the two language groups.

Table 40

The least frequently used strategies by CBL students

Item no.	Strategies	Mean	SD
37	I put labels on physical objects.	1.51	.94
30	I record new words on a phone, or computer and listen to them afterwards.	1.57	.99
38	I post new words on the wall or near my desk to help me memorize them.	1.59	.98
42	I schedule review sessions to review the words I have learned.	1.79	.88
31	I arrange words on a page to group them or to form a pattern.	1.93	1.21
33	I use a flash cards app on my phone or computer.	1.98	1.18
34	I play vocabulary games on my phone or computer.	2.04	1.11
28	I use rhymes.	2.05	1.23
43	I discuss with others about the methods or strategies of memorizing words.	2.09	1.12
46	I skip or pass new words when I read foreign language materials.	2.36	1.11

Table 41

The least frequently used strategies by ABL students

Item no.	Strategies	Mean	SD
38	I post new words on the wall or near my desk to help me memorize them.	1.45	.90
37	I put labels on physical objects.	1.49	.93
30	I record new words on a phone, or computer and listen to them afterwards.	1.50	.87
42	I schedule review sessions to review the words I have learned.	1.90	1.05
43	I discuss with others about the methods or strategies of memorizing words.	1.91	1.06
35	I read foreign language books, newspapers, magazines.	1.93	1.16
31	I arrange words on a page to group them or to form a pattern.	1.95	1.22
28	I use rhymes.	1.98	1.13
41	I write notes, messages, or emails to practice new words.	2.01	1.15
8	I group words together within a storyline.	2.20	1.07

The tables showed that strategies of putting labels (Item37, "I put labels on physical objects."), posting words on walls (Item38, "I post new words on the wall or near my desk to help me memorize them."), and recording new words (Item30, "I record new words on a phone, or computer and listen to them afterwards.") were ranked as the three least used strategies for both groups. Other four strategies were also less used by both groups of students. They include: Item42, "I schedule review sessions to review the words I have learned."; Item31, "I arrange words on a page to group them or to form a pattern."; Item28, "I use rhymes."; and Item 43, "I discuss with others about the methods or strategies of memorizing words.".

As shown in Table 40 and Table 41 as well as the t-tests results shown in Table 42, ABL students used strategies Item35 (reading foreign language books, newspapers) and Item 41 (writing in foreign language) significantly less than CBL students ($t_{(103.61)}$=3.37, p=.001, d=.43; $t_{(105.35)}$=3.39, p=.001, d=.22), while CBL students used strategies Item33 (using flash card apps) and Item34 (playing vocabulary games) significantly less than ABL students ($t_{(142.27)}$=-4.25, p<.001, d=.46; $t_{(136.53)}$=-2.09, p<.001, d=.45).

Table 42

Comparisons between CBL and ABL students in four least used strategies

	Levene's Test for Equality of Variances		t	df	*p*	Cohen's *d*
	F	*p*				
VLS 33	33.120	<.001	-4.251	142.27	<.001	.43
VLS 34	17.330	<.001	-2.094	136.53	.038	.22
VLS 35	9.017	.003	3.373	103.61	.001	.46
VLS 41	8.980	.003	3.392	105.35	.001	.45

Research Question Three

Variables such as gender, major, and motivation are believed to have influence on the use of VLS. Research question three examines these issues. A series of factorial ANOVAs were conducted to examine the main effects of the affecting variables (gender, major, course level, academic level, and heritage learner status) and language type (ABL or CBL), on overall VLS use, and the interaction between language type and the affecting variables. The results are presented below. Female students from the CBL group scored highest among the four groups (M=2.98, SD=.44), whole male students from ABL group scored lowest (M=2.74, SD=.49).

Gender

Table 43 presents the means and standard deviations of each group by gender and language type, and of all participants regardless of the language group they are in.

Table 43

Means, Standard Deviations of average VLS use by gender and language type

	ABL			CBL			Total		
	M	SD	N	M	SD	N	M	SD	N
Female	2.86	.44	255	2.98	.44	33	2.88	.44	288
Male	2.74	.49	155	2.89	.44	48	2.77	.48	203
Total	2.82	.47	410	2.93	.44	81	2.83	.46	491

Table 44 shows the results of a two-way ANOVA test to investigate the main effects of gender and language type on overall VLS use and their interactions. It is indicated that

although female students' average score of VLS use (M=2.88, SD=.44) was higher than male students (M=2.77, SD=.48) regardless of the language they learn, the difference was not statistically significant at the level of .05. ($F_{(1,102.52)}$=3.70, p=.055, η^2=.008). Language type, on the other hand, did have a significant main effect on VLS use, with a medium effect size ($F_{(1,102.52)}$=5.80, p=.016, η^2=.012). There was not an interaction between the two variables ($F_{(1,102.52)}$=.12, p=.735, η^2<.001).

Table 44

Two-Way ANOVA for the effects of gender and language type on VLS use

Source	df	MS	F	p	η2
Language Type	1	1.221	5.802	.016	.012
Gender	1	.779	3.699	.055	.008
Language Type x Gender	1	.024	.115	.735	<.001

Major

College major is believed to be a variable that contributes to the difference in VLS use. The majors of this sample were originally organized into five categories: science, engineering, humanity/liberal art, language, and business, with the intent of closely examine the group differences. However, in the factorial ANOVA procedures presented in this section, the two-category split of majors was adopted – Science and engineering versus humanity, liberal art, and business. Table 45 presents the means and standard deviations of each group by major and language type.

Table 45

Means, Standard Deviations of average VLS use by major and language type

	ABL			CBL			Total		
	M	SD	N	M	SD	N	M	SD	N
Sci-Eng	2.72	.46	106	2.90	.50	34	2.77	.47	140
H-LA-B	2.86	.46	301	2.94	.39	46	2.87	.45	347
Total	2.82	.46	407	2.92	.44	80	2.84	.46	487

Table 46 presents the results from the two-way ANOVA indicating that there was not an interaction between major and language type ($F_{(1,99.87)}$=.76, p=.384, η^2=.002). Language type, like the case for gender, had a significant main effect on VLS use ($F_{(1,99.87)}$=5.19, p=.023, η^2=.011). College major, on the other hand, did not significantly affect VLS use ($F_{(1,99.87)}$=2.25, p=.134, η^2=.005).

Table 46

Two-Way ANOVA for the effects of major and language type on VLS use

Source	df	MS	F	p	η2
Language Type	1	1.073	5.190	.023	.011
Major	1	.466	2.252	.134	.005
Language Type x Major	1	.157	.758	.384	.002

Course Level, Academic Level, and Heritage Learner Status

Two-way analyses of variance were conducted for the variables of course level, academic level and heritage learner status, each variable coupled with the variable of language type. Although group differences in average score of VLS use did exist, these differences were not statistically significant. No significant interactions were found. Tables 47, 48, and 49 present the two-way ANOVA results for these three variables.

Table 47

Two-Way ANOVA for the effects of course level and language type on VLS use

Source	df	MS	F	p	η2
Language Type	1	.194	.925	.337	.002
Course Level	1	.318	1.512	.219	.003
Language Type x Course Level	1	.450	2.143	.144	.004

Table 48

Two-Way ANOVA for the effects of academic level and language type on VLS use

Source	df	MS	F	p	η2
Language Type	1	.501	2.385	.123	.005
Academic Level	4	.057	.271	.897	.002
Language Type x Academic Level	4	.128	.610	.656	.005

Table 49

Two-Way ANOVA for the effects of heritage learner status and language type on VLS use

Source	df	MS	F	p	η2
Language Type	1	.047	.218	.641	.000
Heritage Learner	1	.217	1.020	.313	.002
Language Type x Heritage Learner	1	.294	1.380	.241	.003

Motivation, study time, and GPA

Motivation, study time, and GPA are all continuous variables therefore Pearson Correlation Coefficients were obtained to examine the relationships between these variables and overall VLS use. Table 52 shows these three variables are all significantly correlated with overall VLS use at .05 level, although Pearson coefficient between GPA and VLS use was weak. (r=.385, p<.001; r=.326, p<.001; r=-.094, p=.039, respectively). It is worth noticing that the correlation between GPA and overall VLS use was negative, indicating the higher the GPA, the less often students use VLS.

Table 50

Correlations of overall VLS use with motivation, study time, and GPA

	Motivation	Vocabulary study time	GPA
Overall VLS use	.385**	.326**	-.094*

*p<.05. **p<.01.

Multiple Regression Results

A backward elimination regression was used to determine the contributions of the predictors to overall VLS use. All nine variables - course level, academic level, heritage learner status, and language type, motivation, study time, gender, GPA, and major, were all entered in the initial model. An overall R^2 of .253 was obtained, which indicated the nine predictors together accounted for 25.3% of the variation in overall VLS use. While this model was statistically significant (F=17.584, p<.001) in predicting the dependent variable, a simpler model retaining five predictors emerged, after four rounds of

elimination. Motivation, study time, gender, GPA, and major remained in the final model, contributing significantly in predicting the dependent variable. The R^2 change of -.002 from the initial model to the final model was not significant (p=.320), indicating the elimination of the other four variables did not jeopardize the ability of the model in prediction. 25.1% of the total variance in overall VLS use could be accounted for by the remaining five variables in the final model. Table 53 presents the results from the multiple regression procedure.

Table 51

Regression analysis summary for variables predicting overall VLS use

	B	95%CI	β	t	*p*
Motivation	.151	[.117, .185]	.363	8.673	<.001
Study time	.063	[.041, .084]	.235	5.685	<.001
Gender	-.111	[-.187, -.036]	-.118	-2.897	.004
GPA	-.106	[-.178, -.033]	-.117	-2.876	.004
Major	.110	[.027, .194]	.108	2.598	.010

The above table showed that each variable contributes significantly in predicting overall VLS use, because the p-values of the five predictors were all smaller than .05. Also clear from the results is that motivation was the best predictor because the standardized coefficient β of .363 was the highest among the five. Vocabulary study time ranked second place in predicting overall VLS use. The negative value of GPA's coefficient indicated as GPA increases, less frequently VLS is used.

Chapter 5

DISCUSSION

The purpose of the current study was to: (1) uncover the underlying factors of foreign language vocabulary learning strategies, taking both alphabet-based languages and character-based languages into consideration; (2) describe VLS use and examine the differences in frequency of VLS use between the two groups; (3) identify the effects of gender, college major, motivation and other variables on VLS use. The sample consisted of 492 students enrolled in Chinese, French, German, Italian, Japanese, and Spanish classes at Auburn University during the spring semester of 2014. The Strategy Inventory of Foreign Language Vocabulary Learning, derived mainly from the Vocabulary Learning Strategies Inventory (VOLSI, Stoffer, 1995) and Schmitt's taxonomy (1997), together with demographic information, was administered to the subjects. The collected data were analyzed using a series of statistical procedures as described in the previous chapter. All differences were tested at an alpha level of significance of .05. This chapter summarizes and discusses the findings and presents implications as well as recommendations for future research.

Research Question One

The original intent of research question one was to uncover the underlying factors of vocabulary learning strategies taking both alphabet-based language and character-based language groups into consideration to reach a universal solution. However, results from

EFAs conducted for each of the six language groups revealed that the structure of VLS of CBL students was somewhat different from that of ABL students. Therefore, the CBL group and the ABL group were analyzed separately to examine closely the underlying structures. Results from the exploratory factor analysis revealed that 30 items were clustered around five dimensions for CBL group and 29 items around four dimensions for the ABL group. There were overlaps of items in some factors between CBL and ABL groups, but factor loadings as well as factor structure are essentially different across the two groups.

For the CBL group, a five-factor solution was adopted which accounted for 36.33% of the total variance. The five factors were identified as: Factor 1: Sensory/physical strategies, Factor 2: Genuine language use, Factor 3: Cognitive/metacognitive strategies, Factor 4: Flashcards and games, and Factor 5: Massive input/output. Factor 1, sensory /physical strategies consisted of eight items that involve using visual/auditory assistance and physical actions for word retention. Five of the eight items, namely items 17, 18, 19, 26, and 28, were overlapped with Stoffer's (1995) factor of "physical action". Three to four items were overlapped with the "memory strategies" from studies by Schmitt (1997) and Hsu (2012). Consisting of six items, Factor 2 described the ways in which students engaged in using the words in real-life situations such as writing messages or emails, practicing by interacting with others, and using foreign language media. Five of the six items were the same as those in the factor of genuine language use from Stoffer's study (1995). Therefore, the factor name of genuine language use was adopted for this factor. Factor 3 was loaded by eight cognitive/ metacognitive strategies that required a higher

level of mental processing. Examples of cognitive strategies include students creating mental linkages and making associations for the newly learned words. Meanwhile, planning schedule to study and learning from mistakes exemplify self-regulation and metacognitive abilities. Factor 4 consisted of three strategies that only involved flashcards and vocabulary games. Traditionally, flashcard use was categorized into memory strategy. When developing the current VLS survey, the author was under an impression that as technology evolves, more and more students now utilize computer and phones to assist learning. Therefore, these three items together were included in the survey. It's worth mentioning that the reason item 32 and item 33, both about flashcard use, were not combined was the intention to find out whether students differed in using the "old-fashioned" flashcards and the "high-tech" flashcards. Interestingly, significant difference was found, with "old-fashioned" flashcards winning the competition. Factor 5 consisted of five strategies that did not deal with individual words. Rather, students use word lists, or arrange words on a page, or brainstorm to recall a group of words. When learning multiple words, easy ones come first. For vocabulary output, students utilize free recall. The phenomenon that these five items clustered together was never found in the literature by the author.

In terms of frequency of use of these five strategy categories, Factor 3, *cognitive/metacognitive strategies,* was most used among the five categories, followed by Factor 1 (*sensory/physical strategies*), Factor 2 (*genuine language use*), and Factor 5 (*massive input/output*). Factor 4, *flashcards and games*, was least used. Mental associations (such as linking new words to known words or synonyms/antonyms,

grouping new words by topic or part of speech, using prefix/suffix/root/radical information) and metacognitive strategies (such as planning schedule to have time to study and noticing mistakes) were favored by CBL students. Factor 4, *flashcards and games*, was used least often by CBL students, but not by ABL students. This phenomenon could be explained by the lack of Chinese and Japanese flashcard apps and games.

For ABL group, a four-factor solution that accounted for 28.5% of total variance was adopted, consisting of 29 items. Although there are some overlaps of items with the CBL group, since the inclusion of items is still different, factors were given somewhat different names for ABL group. These four factors were: Factor 1: Putting words in contexts, Factor 2: Utilizing external resources, Factor 3: Using sensory assistance, and Factor 4: Making associations. Factor 1 has some overlapping items with the factor of genuine language use for CBL group. The four items that did not overlap included strategies such as grouping words within a storyline (item 8), connecting a word to a personal experience (item 4), learning the words in a sentence together (item 13), and discussing with others about strategies (item 43). Except item 43, what the rest eight items shared in common was the practice of putting words into contexts instead of solely focusing on the word itself. Therefore, the factor was named *putting words into contexts*. It seemed obvious that Factor 2 of ABL group was a combination of Factor 4 and Factor 5 of CBL groups, consisting of strategies related to utilizing resources such as flashcards and games, a notebook, word lists, paper to arrange words for patterns etcetera. Therefore, the factor was named utilizing external resources. Factor 3 of ABL group consisted of five items that involved sensory strategies such as saying words aloud, visualizing the spelling/shape,

listening to the sound, writing repeatedly, and repeating the words aloud. This factor, therefore, was given the name *using sensory assistance*. Factor 4 consisted of seven strategies that involved students making associations when learning vocabulary. Similar to part of Factor 3 of CBL group, students relate new words to synonyms or antonyms, or to the equivalent in their first language, or to the words that are already known. Students also group words by topic or part of speech, or group words that share the same parts. In addition, students link a word to its usage and use information of prefix, suffix, root, or radical to help memorize.

In examining the use frequency of each strategy category, in order of favorable by ABL students were Factor 4 (*making associations*), Factor 3 (*using sensory assistance*), Factor 2 (*utilizing external resources*), and Factor 1 (*putting words in context*). Multiple comparisons showed the differences between each pair of factors were all significant at .05 level. Similar to CBL students, strategies that involved making associations were used most frequently, followed by strategies of using sensory assistance and utilizing external resources. Although accounting for most total variance out of the four factors, Factor 1, *putting words in contexts* was used least often by ABL students.

Research Question Two

Research question two asked how CBL students and ABL students use strategies differently. In terms of average VLS use, CBL students used VLS significantly more often than ABL students. This is no surprise due to the fact that character-based languages are linguistically more distant from English language. In other words, they are more different from English than alphabet-based languages. This finding is in consistence with the

assumption that learning a more linguistically distant language requires more effort and consequently leading to more strategy use, as elaborated in chapter two of this study.

A closer look at each strategy used by the two groups of students revealed that the strategy of dictionary use was ranked as the most popular strategy by students from both language groups. Other strategies such as connecting to known words, paying attention to word usage, and saying the words aloud while studying were also popular for both groups. These findings are in consistency with studies by Stoffer (1995) and Liu (2013). Interestingly, ABL students frequently connect new words to their first language (cognate or similar words) while CBL students do not have this advantage due to the rare connections between CBL and English. Also interesting is the tendency that CBL students use visualization strategy significantly more often than CBL students. It is not surprising because learning characters does require more visual effort. In addition, CBL students use the strategy of repeatedly writing more often than ABL students. When learning demands more effort, students seem to use the most basic strategy – rote repetition to overcome the difficulty. This finding is similar to Liu's (2013) and McGinnis' (1999) studies on Chinese language learners. Pertaining to least used strategies, two groups of students agreed on top four strategies – putting labels on objects, posting vocabulary on the wall, recording new words and listening to them later, and scheduling review sessions. Unique to CBL students, flashcards apps and vocabulary games were in the top ten least used strategy list. As mentioned earlier, this fact could be due to the lack of Chinese and Japanese flashcards apps and games, compared to the well-developed market of Spanish as foreign language. In addition, as mentioned in research question one, ABL students did

not tend to put words in use, compared to their CBL peers. Two least used items (item 35 and item 41) of ABL group proved this statement. ABL students less often read foreign language books/newspapers/magazines and write notes/messages/emails than CBL students.

Research Question Three

Research question three explores the influences of variances such as gender, major, course level, and motivation on the use of VLS. Both ANOVA and multiple regression were employed to examine the effects of these variables. In regards to the effect of gender, ANOVA results showed the main effect close to reaching the significant level of .05, with scores of female students higher than male students. It indicated that female students generally used VLS significantly more often than male students, when taking both language groups into consideration. This finding is in accordance with the conclusion by Yin (2008) in her literature review. Interestingly, when looking at the two language groups separately, such gender difference was only found in ABL group. One obvious explanation is that due to the difficulty students encounter when learning a character-based language, students use VLS more often across the two genders. However, an alternative explanation is that due to the relatively small sample of CBL students (81 total), the statistical power to detect the difference was not as strong. A larger sample in future studies will contribute in finding gender difference in VLS use for CBL group students.

College major is also believed to be a variable that contributes to the difference in VLS use. Previous literature does not have a consensus in terms of how to categorize the great

number of majors existed. Therefore, the current study applied different methods. Originally, the majors of this sample were organized into five categories: science, engineering, humanity/liberal art, language, and business. Results showed that although science students seem to have a lower VLS use score, no significant difference was found among these majors. Using another categorizing method, science and technology versus social sciences, results indicated although humanity, liberal art, and business students scored higher in VLS use in general, no significant different was found. College major does not have a main effect on average VLS use when the factor of language type was taken into consideration.

Difference in using VLS (a) between students enrolled in different course levels, (b) between students in academic levels, and (c) between heritage learners and non-heritage learners, were all investigated along with gender and major. In general, none of these three variables had significant influence on average VLS use.

Three other variables, motivation, study time, and GPA, treated as continuous variables, were found to be significantly correlated to overall VLS use although GPA has a low correlation coefficient. What is worth noticing is not only the strength of the correlations, but also the direction of the correlations. Specifically, correlations between motivation and VLS use and between vocabulary study time and VLS use were positive and between GPA and VLS use was negative. This means students use VLS more often when they (1) are more motivated, (2) spend more time studying vocabulary, and (3) have a lower GPA. The result regarding the effect of motivation was consistent with previous studies (e.g. Oxford and Nyikos, 1989; Okada, Oxford, and Abo, 1996; Oxford, Park-Oh, Ito and Sumrall,

1993; and Schmidt and Watanabe, 2001). Hsiao (1995) found similar result on the relationship between time spent studying the language and VLS use.

Results from a multiple regression revealed that variables of motivation, study time, gender, GPA, and major did make significant contribution in predicting overall VLS use while course level, academic level, heritage learner status, and language type did not. Among the nine predictors, motivation is the most influential. This is consistent with Hsiao's finding (1995) and Gardner's assertion (1985) about the influence of motivation on language learning in general.

Implications

It is clear that, from the results of research questions one and two, CBL and ABL students do use vocabulary learning strategies differently, both in frequency and in types. Language teachers should keep this in mind and encourage students to use language appropriate strategies. For example, utilizing visual assistance is critical for CBL students since character's visual structure is the core of the character. It can convey the meaning, and sometimes indicate the sound of the character. An example for ABL students is making connections to English knowledge. Teachers could explicitly mention the connections between new foreign language words and English, whether they are cognates or similar in spelling.

For the less-used strategies for both groups, if these strategies are potentially helpful, teachers could design more activities or point to available resources to facilitate student using these methods. For example, the study by Ahmed (1989) showed good language learners knew the importance to learn words in context while poor learners

showed little interest in learning words in context. The current study showed the lack of attention to context for ABL students in general. Therefore, teachers could provide opportunities for students to read small paragraphs or to write emails to pen pals to shift the focus from the words themselves to the use/function of the words. Nation (2001) listed four important ways in which teachers can help learners improve learning from context: (1) helping them to find and choose reading and listening material of appropriate difficulty; (2) encouraging them to read a lot and helping them gain a lot of comprehensible spoken input; (3) improving their reading skills so that they read fluently and with good comprehension; and (4) providing raining in guessing from context (Nation, 2001, p.250). For CBL students, teachers could point students to flashcards apps and/or vocabulary games available out in the market. Even more, for teachers who are capable, designing and developing vocabulary apps or games for students would be beneficial for both students and teachers too.

The current study identified the influences of variables such as motivation, gender, major, GPA, and study time on VLS use. These variables can be used to identify students more likely to need strategy-learning support. Teachers should take these variables into consideration when offering students advice about using language learning strategies or when conducting strategy training or instruction. Besides teachers' awareness of students' VLS use and these affecting variables, it is also important to raise students' awareness to allow students to take more control of their study.

Motivation, believed to be the primary determining factor in language learning (Gardner, 1985), was found in this study to be the single best predictor of VLS use. Due to

its importance in language learning, teachers should work on motivating students, not only to improve VLS use, but ultimately to improve learning outcome in general.

Limitations and Recommendations

The first limitation of the current study lies in the instrument, the Strategy Inventory of Foreign Language Vocabulary Learning. As a self-reported questionnaire, it suffers from the disadvantages of self-report techniques such as the possible inaccuracy of recall and the tendency to give socially desirable answers. Literature in the field of language learning strategies showed that qualitative methods using observation, diary, or interview may complement self-report questionnaire in finding a more holistic picture of language learning strategy use. Also limited is the inclusion of strategy items in the questionnaire. Although a small-scale pilot study was conducted, which gave information on revising, deleting, and adding strategy items, it seems to the author that if more participants were included in the pilot study, more revising could have been done to improve the questionnaire. One such example of possible revision is to exclude some less used strategies such as putting labels on objects. Some studies had already shown that it was a least-used strategy, if the pilot study indicated a similar result, it is reasonable to exclude it from the instrument to eliminate the interference of this item to the structure of VLS as a whole and to shorten the questionnaire at the same time. The open-ended question at the end of questionnaire serves to give participants opportunities to inform the researcher of their not-included strategies or reasons to take the foreign language classes. Strategies such as doing homework as practice were mentioned by a small number of students and were included in some instruments in previous studies (e.g. Liu, 2013). Also

could have been included was the family factor as a reason to enroll in a foreign language course. The current eight reasons included self and friends, but did not include family. The author believed this omission could have been avoided if the sample size of pilot study was larger. In addition, the items of the current survey were taken from different existing surveys. The internal validity is still an issue that is worth investigating. Future studies could be conducted along this issue after further revision of the current survey. Evidence of validity and reliability needs to be collected before more conclusions can be made from using this survey.

Related to the first limitation, there was room to improve in the measuring of motivation in the present study. Given the total length of the measuring instrument, only four motivation items were included. These four items are, however, all general statements about students' belief of their motivation. Although the results showed consistent findings with previous studies, a better measurement of motivation is suggested to researchers who intend to examine closely the relationship between motivation and language learning strategies.

Thirdly, authors in some similar studies (e.g. Stoffer, 1995) pointed out that the instrument in these studies was only administered to participants at one point in time. It only captured what the students believed at the time of data collection. The current study suffered from the same condition. Therefore, it is suggested future researchers could investigate students' VLS use over time, possibly at the beginning and end of semester or before and after strategy training.

A fourth limitation of the current study was found in the sampling procedure. Due to

the limited availability of courses and instructors, some of the participants were from the same instructor or from the same course level, which made the influence of instructor and course level confounded with other the influences of other factors. For example, there was only one Japanese teacher at the university and all Italian students were from the classes of one instructor. It would be difficult to eliminate the influence of class instruction and characteristics of the instructors on students' VLS use. Similarly, all French students, all Italian students, and most German students were at beginning level. More variation may emerge if students from different classes were included.

Another limitation concerns the selection of predictor variables. Although a total of nine variables were selected to examine the influence on VLS use and to predict VLS use, other variables capable of making contribution to predicting VLS use have not been considered or included. More such variables could be included so that more of the total variance of VLS use could be explained. Consequently, VLS use as a construct could be better understood.

In terms of data analyses procedures, one desirable next step for the current study is to perform confirmatory factor analysis on both language groups to confirm the proposed classifications. Due to the focus of the current study and the relatively small CBL sample, CFA was not performed. However, as a natural follow-up of EFA, CFA is strongly recommended for future research confirming the proposed structural model.

Generalizability of the results is another limitation of the current study. Since the sample consisted of American college students enrolled in Chinese, French, German, Italian, Japanese, and Spanish at Auburn University, research findings may not be applied

to students (1) of different ages, (2) with first language being other languages than English, (3) learning different languages, (4) in different settings, or (5) from other parts of the world. Related to this limitation, students of different ages, and/or who learn other languages such as Arabic, Russian, or Korean could be investigated in future research.

Studies such as the current one only focus on the "popularity" of strategies. However, one has to admit that not all popular or favorable strategies by students are useful and effective, and the less-used strategies may be more helpful. Since the ultimate goal for language learning strategies is improve student learning outcome, the usefulness and effectiveness of learning strategies should receive more attention to inform teachers and students so that they can distinguish between "good" strategies and "bad" strategies.

Conclusion

The integration of strategies for learning both alphabet-based languages and character-based languages made its unique contribution to the typology/classification of vocabulary learning strategies. The descriptions of the current VLS use will inform both students and teachers of the different strategies and the actual use of each strategy. For students, their awareness of multitudes of VLS will give them more insight about what to do when encountering new words and when trying to consolidate words learned. Students' self-awareness of VLS use can be enhanced so that they can take more control of their own learning both inside and outside the classroom (Sung, 2009). For teachers, findings about students' actual use of language learning strategy will help teachers better implement their instruction. Many studies have shown that effective teaching of learning strategies yields positive results in L2

proficiency (e.g. Huang, 2001; Johnson, 1997). The current study will also make its contribution to the field of LLS and VLS by providing new information on the effects of gender, major, motivation, and other variables.

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Appendix A

The Strategy Inventory of Foreign Language Vocabulary Learning

Strategy Inventory of Foreign Language Vocabulary Learning

Thank you for participating in this study. Please take a moment to complete the following questions. The answers you give will provide valuable information to foreign language studies. Your participation and contribution is highly appreciated!

1. Gender: (a) Male (b) Female
2. Academic level: (a) freshman (b) sophomore (c) junior (d) senior (e) graduate student
3. Major:_____

   2nd major or minor:_____
4. Current GPA (best estimate if not sure): _____
5. What was the first language you learned as a child? (Choose one.)

   (a) English, (b) Other language, please specify:_____
6. Other than English and the foreign language you are learning in this class, do you speak any other languages or have you taken other language courses?

   (a) No (b) Yes, what language(s)?_____ _____ _____
7. Which foreign language course are you currently enrolled in? (If more than one, indicate the one you are most actively learning this semester)

   Language: (a) Chinese (b) French (c) German (d) Italian (e) Japanese (f) Spanish

   Level: (a) 1010 (b) 1020 (c) 2010 (d) 2020 (e) other:_____
8. Do you identify yourself to be a heritage learner of a language? (For example, say you are now taking a Korean class, and your parents speak mainly Korean.)

   (a) No (b) Yes, what language?_____
9. Outside of the classroom, how many minutes per week do you generally spend studying the vocabulary of this language? (Choose one.)

   (a) 0-15 min (b) 16-30 (c) 31-45 (d) 46-60 (e) 61-75 (f) 76-90 (g) 90-120 (h) 120+
10. Outside of the classroom, how many minutes per week do you spend studying the language other than studying vocabulary? (Choose one.)

    (a) 0-15 min (b) 16-30 (c) 31-45 (d) 46-60 (e) 61-75 (f) 76-90 (g) 90-120 (h) 120+

The following questions ask about foreign language vocabulary learning strategies. Please read each statement carefully and indicate how often you actually use that particular strategy by circling one of the responses.

1 = Never or almost never
2 = Seldom (once or twice a semester)
3 = Sometimes (several times per semester)
4 = Often (almost every week)
5 = Always or almost always (every time I study)

1	I connect a new word to a word in my first language (cognate or similar sound).	1	2	3	4	5
2	I connect a new word to words I already know.	1	2	3	4	5
3	I connect a new word to its synonyms and antonyms.	1	2	3	4	5
4	I connect a new word to a personal experience.	1	2	3	4	5
5	I connect a new word to its location on a page or the occasion where I saw it.	1	2	3	4	5
6	I group new words by topic or part of speech (food, numbers, nouns, verbs).	1	2	3	4	5
7	I group words that share the same parts (prefix, suffix, or root; or radicals).	1	2	3	4	5
8	I group words together within a storyline.	1	2	3	4	5
9	When I meet an unknown word, I use a dictionary (including phone app and online dictionary) to look up its meaning.	1	2	3	4	5
10	When I meet an unknown word, I ask a teacher, classmates, or native speakers.	1	2	3	4	5
11	When I meet an unknown word, I guess it from context.	1	2	3	4	5
12	I learn easy words first.	1	2	3	4	5
13	I learn the words in a(n) sentence/idiom together.	1	2	3	4	5
14	Besides the meaning of a word, I pay attention to how to use it.	1	2	3	4	5
15	I pay attention to the sample sentences when I look up a word in a dictionary.	1	2	3	4	5
16	I say a new word aloud when studying.	1	2	3	4	5
17	I visualize the spelling/shape of a word.	1	2	3	4	5
18	I picture the meaning of the word.	1	2	3	4	5
19	I use physical actions or act out the word to help me remember it.	1	2	3	4	5
20	I use prefix, suffix, root, or radical to help me memorize.	1	2	3	4	5
21	I take notes in class.	1	2	3	4	5
22	I keep a vocabulary notebook.	1	2	3	4	5
23	I test myself or have others test me on new words outside of class.	1	2	3	4	5

1 = Never or almost never
2 = Seldom (once or twice a semester)
3 = Sometimes (several times per semester)
4 = Often (almost every week)
5 = Always or almost always (every time I study)

24	I use brainstorming to recall new words from the same topic.	1	2	3	4	5
25	I listen to the sound of the word repeatedly.	1	2	3	4	5
26	I write new words repeatedly.	1	2	3	4	5
27	I repeat a new word aloud several times.	1	2	3	4	5
28	I use rhymes.	1	2	3	4	5
29	I use word lists.	1	2	3	4	5
30	I record new words on a phone, or computer and listen to them afterwards.	1	2	3	4	5
31	I arrange words on a page to group them or to form a pattern.	1	2	3	4	5
32	I use flash cards.	1	2	3	4	5
33	I use a flash cards app on my phone or computer.	1	2	3	4	5
34	I play vocabulary games on my phone or computer.	1	2	3	4	5
35	I read foreign language books, newspapers, magazines.	1	2	3	4	5
36	I use foreign language media (songs, movies, radio programs, newscasts, etc.).	1	2	3	4	5
37	I put labels on physical objects.	1	2	3	4	5
38	I post new words on the wall or near my desk to help me memorize them.	1	2	3	4	5
39	I practice using the words by interacting with others.	1	2	3	4	5
40	I make up sentences using newly learned words.	1	2	3	4	5
41	I write notes, messages, or emails to practice new words.	1	2	3	4	5
42	I schedule review sessions to review the words I have learned.	1	2	3	4	5
43	I discuss with others about the methods or strategies of memorizing words.	1	2	3	4	5
44	I plan my schedule so I will have enough time to study the vocabulary.	1	2	3	4	5
45	I notice the mistakes I made when using words and use that information to help me do better.	1	2	3	4	5
46	I skip or pass new words when I read foreign language materials.	1	2	3	4	5
47	I use other strategies that are not listed above. If so, please specify: _____	1	2	3	4	5

Regarding the reason why you want to learn this language, please circle one of the numbers from 1 to 6 that best describes you.

1= Not true of me at all
2= Mostly not true of me
3= Sort of not true of me
4= Sort of true of me
5= Mostly true of me
6= Very true of me

1	Interest in the language itself	1	2	3	4	5	6
2	Interest in the culture	1	2	3	4	5	6
3	Interest in communicating with people speaking this language	1	2	3	4	5	6
4	Required to get the degree	1	2	3	4	5	6
5	To get a job or for future career	1	2	3	4	5	6
6	Need it for travel to a country where the language is spoken	1	2	3	4	5	6
7	Easy credits	1	2	3	4	5	6
8	Have friends or acquaintances who speak the language	1	2	3	4	5	6
9	Other reasons:_____	1	2	3	4	5	6

Please rate each of the following items in terms of how you feel about learning a foreign language. For each item, please circle a number from 1 to 6 that best describes you.

10	My interest in foreign languages in general is:						
	LOW					HIGH	
	1	2	3	4	5	6	
11	My motivation to learn this particular foreign language is:						
	LOW					HIGH	
	1	2	3	4	5	6	
12	My desire to learn this particular foreign language is:						
	WEAK					STRONG	
	1	2	3	4	5	6	
13	My attitude toward learning this particular foreign language is:						
	UNFAVORABLE					FAVORABLE	
	1	2	3	4	5	6	