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Validation of a Vocabulary Learning Strategy Scale and Its Relationship to Vocabulary Level Test Scores

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The purpose of this study is two-fold: firstly, to validate a questionnaire of self-regulated vocabulary learning strategies (VLS), based on a strategic self-regulation (S^2R) model of language learning (Oxford, 2011), and secondly, to investigate the relationships between self-regulated VLS and vocabulary size. An explanatory factor analysis on the data of 216 Japanese EFL students yielded the following seven factors, which could reflect constructs hypothesized from the S^2R model to a reasonable extent: (a) planning for goal achievement, (b) obtaining and using preferred resources, (c) conceptualizing by linking/combining related vocabulary, (d) planning for positive affective strategies, (e) using auditory sense to understand and remember, (f) generating and maintaining extrinsic motivation, and (g) increasing instrumental motivation. Among the seven strategic vocabulary learning constructs, (b), (c) and (g) were moderately correlated to vocabulary size. Furthermore, these strategies were strongly correlated with self-regulatory and planning strategies. The results suggest an integral role for these variables in vocabulary learning.

Introduction

The notion of language learning strategies (LLS) has become firmly established during the past 30 years in the field of Second Language Acquisition (Cohen & Macaro, 2007). The definition of LLS dates back to Rubin (1975, p. 43): "the techniques or devices which a learner may use to acquire knowledge." Researchers in the 1970s (e.g., Naiman, Frohlich, Stern, & Todesco, 1978; Rubin, 1975; Stern, 1975) initially attempted to identify characteristics of good language learners. Since then, LLS research has received more and more attention, culminating in the 1990s in the publication of a large body of representative literature (e.g., O'Malley & Chamot, 1990; Oxford, 1990).

In recent years, it may be argued that the notion of LLS has undergone a revolutionary period, and the term is being replaced by "strategic learning" under the concept of "self-regulated learning" (Rose, 2012). According to Zimmerman and Schunk (2011), "self-regulated learning and performance refer to the processes whereby learners personally activate and sustain cognitions, affects, and behaviors that are systematically oriented toward the attainment of personal goals" (p. 1). Further, the paradigm is interdisciplinary, and bridges cognitive, socio-cultural, and affective strands. Therefore, researchers made an attempt to cover various aspects of learning, and this approach raises the potential for new research (Tseng, Dörnyei, & Schmitt, 2006).

Strategic Self-Regulation (S^2R) Model

Oxford (2011) developed the Strategic Self-Regulation (S^2R) model under the concept of self-regulation. She defined self-regulated L2 learning strategies as "deliberate, goal-directed attempts to manage and control efforts to learn the L2. These strategies are broad, teachable actions that learners choose from among alternatives and employ for L2 learning purposes" (p. 12). Her definition covers a wide range of strategies based on psychological, socio-cognitive, and socio-cultural strands, offering cornerstones for strategies in affective and socio-cultural dimensions.

Oxford (2011) further extended the classification of LLS by stretching the scope of meta-strategies (e.g., planning, monitoring, and evaluating) with the following three major strategy dimensions: (a) cognitive, (b) affective, and (c) socio-cultural-interactive (SI).

Meta-strategies refer to strategies that function as executive controls over the deployment of cognitive, affective, and SI strategies. According to Oxford's classification, three categories of meta-strategies are (d) meta-cognitive, (e) meta-affective, and (f) meta-SI strategies. She described these meta-strategies and strategies as follows:

> Cognitive strategies help the learner construct, transform, and apply L2 knowledge. ...Affective strategies help the learner create positive emotions and attitudes and stay motivated. ... SI strategies help the learner facilitate communication, adapt to socio-cultural contexts ... [and] ... develop one's identity.... Meta-cognitive strategies ... help the learner control cognitive strategy use, while meta-affective strategies facilitate learner control of affect strategy use ... [and] ... meta-SI strategies enable the learner to control SI strategy use. (Oxford, 2011, pp. 14–16)

Literature Review: Vocabulary Learning Strategies

Because vocabulary is a fundamental foundation for major language skills (e.g., Alberchtsen, Haastrup, & Henriksen, 2008; Alderson 2005; Laufer & Goldstein, 2004), vocabulary learning strategies (VLS) have attracted the attention of researchers for their potential contribution to various aspects of vocabulary knowledge (Nation, 2001), and interest in this area has led to the development of a VLS taxonomy (e.g., Gu & Johnson, 1996; Schmitt, 1997). Although little attention was paid to VLS in the affective dimension, the research shift toward self-regulation presented strategic behaviors relevant to the affective category (e.g., Dörnyei, 2005; Tseng et al., 2006; Tseng & Schmitt, 2008). Their self-regulating capacity in vocabulary learning (SRCvoc) showed five components based on self-regulatory strategy framework from Dörnyei (2001) and classifications of action control strategies from Kuhl (1987), and Corno and Kanfer (1993): (a) commitment control, (b) meta-cognitive control, (c) satiation control, (d) emotion control, and (e) environment control.

Tseng and Schmitt (2008) indicated the functions of SRCvoc and other latent variables. In addition to SRCvoc, their model included latent variables concerning strategic learning, such as initial appraisal of vocabulary learning experience (IAVLE), strategic vocabulary learning involvement (SVLI), master of vocabulary learning tactics (MVLT), and post-appraisal of vocabulary learning tactics (PAVLT). SVLI, which

could be considered as meta-cognitive strategies to regulate general learning behaviors, was referred to "quantity dimension of strategy use, which concerns effortful covert or overt acts to discover or improve the effectiveness of particular tactics" (Tseng & Schmitt, 2008, p. 364). MVLT was referred to "quality dimension of strategy use, which concerns mastering specific or special covert or overt learning methods to acquire vocabulary knowledge" (Tseng & Schmitt, 2008, p. 364). MVLT covered cognitive and social tactics selected from Gu and Johnson (1996) and Schmitt (1997). They were grouped into linking, comprehending (analyzing and guessing), highlighting, imaging, hands-on (tactics involving the use of hands, such as writing on word cards and labeling English words on objects), and social tactics.

A major interest of researchers focused on questions of how VLS use was related to learning achievement, vocabulary knowledge, and overall English proficiency (e.g., Fan, 2003; Gu & Johnson, 1996; Horino & Ichikawa, 1997; Kojic-Sabo & Lightbown 1999; Maeda, Tagashira, & Miura, 2003; Mizumoto & Takeuchi 2009a; Tanaka, 2012; Tseng & Schmitt, 2008). Previous findings indicated that proficiency level played a major role in the choice of VLS (e.g., Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999; Sanaoui, 1995) and frequency of VLS use (e.g., Ahmed, 1989; Fan, 2003; Gu & Johnson, 1996; Sanaoui, 1995). It was also suggested that some types of strategies might have a positive effect on enhancing vocabulary knowledge (e.g., Fan, 2003; Horino & Ichikawa, 1997; Tanaka, 2012). Recent research has pointed to the role of strategic regulation as an indirect variable affecting vocabulary knowledge (e.g., Mizumoto, 2011; Tseng & Schmitt, 2008).

When focusing on vocabulary size, strategies involving note-taking, memory (association, cognitive encoding, and guessing), and selective attention strategies have been found to have weak correlations with vocabulary size (Gu & Johnson, 1996), while dictionary strategies have been shown to be weakly or moderately related to vocabulary size (e.g., Gu & Johnson, 1996; Kojic-Sabo & Lightbown, 1999). Both of these studies found the most significant relationship to be between self-initiative strategies, which enhance opportunities for word input and use, and vocabulary size. Fan (2003) showed evidence for the causality of direction from self-initiative strategies to vocabulary size.

In recent years, Tseng et al. (2006) and Tseng and Schmitt (2008) investigated the effects of self-regulation on vocabulary learning.

Following their instrument development of SRCvoc (Tseng et al., 2006), Tseng and Schmitt (2008) demonstrated a cyclic process of vocabulary learning in the following order: (1) IAVLE, (2) employment of SRCvoc, (3) use of SVLI, (4) use of MVLT, (5) development of vocabulary knowledge, and (6) PAVLT. Their model showed a satisfactory fit with the empirical data (χ^2/df = 1.89, GFI = .87, and CFI = .92). The results suggested that vocabulary learning is a recursive process, and each function of their mentioned constructs played essential roles in proactive vocabulary learning.

A seminal study of VLS use by Japanese learners of English as a foreign language (EFL) was carried out by Horino and Ichikawa (1997). While developing a VLS questionnaire for Japanese high school students (N = 321), they identified the following three VLS: (a) organization, (b) imagery and (c) repetition. Among these strategies, only organization significantly predicted the scores on three English achievement tests (β = .26~.32). The validity of Horino and Ichikawa's (1997) questionnaire was confirmed by Maeda et al. (2003), with a confirmatory factor analysis (CFA) on 1,177 Japanese EFL high school students (CFI = .99, RMSEA = .069).

Previous studies in the Japanese EFL context investigated cognitive strategies only, but recent research (Mizumoto & Takeuchi, 2009a; Tanaka, 2012) has sought to develop VLS questionnaires to include meta-cognitive dimensions. Mizumoto and Takeuchi (2009a) developed a psychometrically valid VLS questionnaire for Japanese EFL university students following the guidelines proposed by Tseng et al. (2006). When it was administered to 283 EFL Japanese university students, the results of a CFA confirmed its validity (χ^2/df = 1.76, GFI = .88, and CFI = .93). Six subscales—self-management, input-seeking, imagery, writing rehearsal, oral-rehearsal, and association—were classified into meta-cognitive or cognitive dimensions. Their correlation analyses identified the relationships between four subscales and TOEIC scores (r = .13~.39), and their subsequent study also showed similar results (r = .15~.39). Among them, the most meaningful correlation was input-seeking (r = .39 in both studies). Furthermore, the researchers conducted structural equation modeling to investigate an effect of VLS as a whole toward TOEIC. The path coefficients from VLS to TOEIC in two studies showed moderate effects on TOEIC (.41 for study 1 and .31 for study 2). This result suggested that VLS were effective when learners used them in combination.

Tanaka (2012) performed a CFA on the data of 215 Japanese EFL students. His study further classified six subscales into initial strategic learning (oral rehearsal and writing rehearsal) and advanced strategic learning (note-taking, organization, reference, and language exposure), specifying meta-cognitive regulation as a latent variable to affect initial strategic learning and advanced strategic learning. His model showed that meta-cognitive control had a strong effect on advanced strategic learning (β = .85) and a relatively strong effect on initial strategic learning (β = .58). Although the former significantly predicted vocabulary knowledge based on vocabulary size, association, and grammatical usage tests (β = .52), the latter did not show a significant effect on vocabulary knowledge. The researcher argued that an additional validation of the VLS questionnaire would be necessary due to several low indices for the overall model fit (GFI = .816, AGFI = .782).

Affective variables regarding VLS in the Japanese EFL context were explored in Mizumoto (2011). He examined the effect of self-efficacy on vocabulary learning among 281 Japanese EFL university students. He adopted SRCvoc, and the results showed that there was a relatively strong relationship between self-efficacy and self-regulatory capacity (r = .59). Although SRCvoc showed only a marginal link with vocabulary size (r = .13), self-efficacy had the strongest relationship with vocabulary size (r = .26). Moreover, he found that the students' strategy use varied by the degree of self-efficacy. Taken together with the results of Tseng and Schmitt (2008), this finding might suggest that self-regulation could indirectly affect the development of vocabulary knowledge by influencing direct strategic learning interacting with self-efficacy or evaluation of tactics and vocabulary learning experiences.

Research Questions

Previous research offers many intriguing insights into VLS, but there are still many areas that remain unexplored. Typically, using a self-report questionnaire, past findings explored VLS in meta-cognitive and cognitive dimensions in the Japanese EFL context (e.g., Horino & Ichikawa, 1997; Maeda et al., 2003; Mizumoto & Takeuchi, 2009a; Tanaka, 2012). However, the instruments used in previous studies did not cover affective or social VLS. Therefore, it would be worthwhile to broaden the scope of research into affective or social dimensions and to develop an instrument that covers both of these dimensions. To

investigate strategies in these dimensions, Oxford's (2011) new model, grounded in self-regulated learning, is useful because it is built on a series of relevant theories concerning each dimension. In the present study, the following research questions were addressed:

(a) To what extent is a VLS questionnaire applying the S^2R model valid and reliable?
(b) To what extent are different types of VLS associated with vocabulary size?

Methodology

Participants

Two hundred and fifty-one EFL students at two private universities and one junior college participated in this study. Of these, approximately 200 were first-year or second-year students in the Japanese educational system, which meant that most participants were likely to be aged between 18 and 20 years old. Their academic majors included law, international relations, English literature, and early childhood education. All the participants had studied English for at least six years in Japanese secondary education. Based on participants' university ranking and anonymous self-reported profiles, it was assumed that most participants had elementary to pre-advanced foreign language skills. Among them, about one-third of the participants were considered to have upper intermediate or pre-advanced English proficiency. Those who had lived abroad for more than five months were excluded from the study.

Instruments

The questionnaire was composed of three sections. Section 1 asked the participants' background information including gender, academic major, experience living abroad, and English proficiency. Section 2 was designed to capture the extent to which the participants used different strategic vocabulary learning approaches. Section 3 aimed to investigate participants' vocabulary size.

Section 2 contained 57 items concerning vocabulary learning tactics that could originally be grouped into 10 subcategories: (a) planning for

cognitive development (k = 6), (b) seeking sources for cognitive development (k = 6), (c) imagery learning (k = 5), (d) haptic learning (k = 5), (e) auditory learning (k = 5), (f) association (k = 6), (g) evaluating affective strategy use (k = 6), (h) planning for affective strategy (k = 6), (i) increasing extrinsic motivation (k = 6), and (j) increasing intrinsic motivation (k = 6). They were hypothesized to cover four out of six dimensions in S^2R model. The items on this questionnaire with a six-point Likert scale were adopted from Tseng et al.'s (2006) SRCvoc for Japanese EFL context (Mizumoto, 2011; Mizumoto & Takeuchi, 2012) and VLS instrument from Mizumoto (2010) and Mizumoto and Takeuchi (2009a). Their wordings were changed if needed in order to align with the strategy functions in the S^2R model. Furthermore, in order to increase the amount of affective items, additional items were compiled by referring to Fujita (2005), Oxford (2011), and Pintrich, Smith, Garcia, and McKeachie (1991).

The third section of the questionnaire was a vocabulary size test, which included 30 multiple-choice items. Only 10 random words chosen from the 2,000-, 4,000-, and 6,000-word levels in the vocabulary size test (Mizumoto & Shimamoto, 2008) were used, in order to shorten the test. The vocabulary test was developed based on JACET 8,000 (JACET, 2003) because the word frequency list was made for Japanese EFL learners. Each item has four choices, and there are three incorrect choices from the same frequency level (i.e., frequency of word occurrence). The test originally has 20 items for each section ranging from 1,000 to 8,000 word levels. The reliability of the test with all items (k = 160) was high and satisfactory (α = .94).

Procedures

In late July 2012, the author was allowed to present and explain the purpose of the study during or at the end of several classes. The participants were asked to complete the questionnaires anonymously, and were informed that the data collected would be used only for research purposes. Further, they were told that they could stop providing data at any time. Having given their informed consent to the data collection, the participants spent 15 to 20 minutes completing the questionnaire.

Data Analysis

An explanatory factor analysis (EFA) was carried out to answer the first research question. Principle axis factoring with Promax rotation was used to interpret the results. The final solution was based on the following criteria: (a) exclusion of variables that loaded on two factors, (b) exclusion of conceptually dissimilar items against other conceptually coherent items within one factor, (c) retention of variables with factor loadings greater than .39, and (d) eigenvalues above 1.0. Descriptive statistics and Cronbach's alpha coefficients were additionally calculated in order to provide information on factors extracted from the analysis.

The data was screened to meet the assumptions for factor analysis. Thirty-five outliers were not included in the analysis. The remaining data of 216 participants (male = 72; female = 144) were subjected to further analysis. Because Items 1, 2, and 5 were skewed, they were not used for the analysis. Item 17 was deleted because corrected item-total correlation was less than .40, which indicated that the item had little correlation with the other items.

The relationships between seven VLS variables and scores of vocabulary size were examined in order to answer the second research question. Initially, descriptive statistics and Cronbach's alpha coefficients over the 2,000-, 4,000-, and 6,000-levels of vocabulary frequency were calculated. Then, an item analysis was conducted to gain further information regarding the vocabulary size test items used in this study. Finally, correlations between seven types of VLS and vocabulary size score were investigated.

Results

The principle axis factoring with Promax rotation yielded seven factors of VLS as shown in Table 1. The seven factors retained with criterion of eigenvalue over 1.0 accounted for 68% of the total variance. The Kaiser-Meyer-Olkin value was .95, which indicated excellent suitability of using factor analysis (Kaiser, 1974) on the data collected for this research. The high values of reliability for the seven factors indicated that the consistency of items for each factor was satisfactory. Table 1 shows the factor loadings of the 41 items on seven factors. Descriptive statistics for the seven factors are provided in Table 2.

Table 1. The Results of an Exploratory Factor Analysis after Promax Rotation (N = 216)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	h^2
41	**.89**	.05	-.09	-.03	-.09	.09	.01	.75
24	**.76**	-.09	.03	.09	-.01	.03	-.04	.61
42	**.75**	-.03	.02	.12	-.02	.13	-.11	.71
37	**.64**	-.07	.05	-.06	.02	-.04	.29	.59
38	**.57**	-.31	.11	.14	.11	.23	-.09	.53
30	**.56**	.18	.02	-.11	.08	-.05	.19	.58
39	**.55**	.19	-.10	.05	.12	.14	.09	.73
40	**.54**	.04	.00	-.10	.00	.39	-.03	.58
15	**.41**	-.31	.26	.29	-.03	-.11	.21	.49
56	-.12	**.81**	.03	-.01	-.12	.26	-.01	.73
57	.13	**.76**	.11	.25	-.10	-.24	-.15	.76
49	-.14	**.76**	.00	-.02	.16	-.04	.01	.55
52	.22	**.65**	.03	-.14	.03	-.01	.14	.70
34	-.38	**.64**	.12	.22	.11	.07	.09	.58
48	.26	**.52**	-.09	.00	-.06	.11	.13	.60
21	.06	.10	**.90**	-.11	-.04	-.15	.05	.74
31	-.03	.12	**.69**	-.09	.12	.04	.09	.70
16	-.06	-.11	**.68**	.14	-.03	.05	.08	.52
18	-.02	-.07	**.627**	.06	-.01	.17	.00	.48
22	.14	.19	**.60**	-.03	-.02	-.07	.13	.68
33	-.10	.27	**.51**	.04	.05	.20	.01	.67
10	.13	.00	**.50**	.22	.15	-.07	-.22	.51
11	-.01	.06	-.12	**.73**	.09	.01	.09	.60
3	.13	.03	.15	**.61**	-.12	.09	-.20	.57
19	.01	.07	.05	**.54**	.02	.09	.16	.60
13	-.03	-.03	.05	**.52**	.08	.09	.25	.56
32	.13	.00	-.02	**.50**	-.01	.23	.06	.58

(Cont'd Table 1)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	h^2
7	-.12	.07	.02	**.50**	-.03	.11	.19	.39
6	.19	.33	.08	**.48**	-.03	-.16	.00	.68
35	-.04	-.05	.04	.01	**.77**	-.01	-.01	.55
46	.13	.38	-.20	.05	**.61**	-.04	-.08	.63
50	.04	.04	.22	-.07	**.57**	.16	-.21	.51
55	.12	.17	-.17	.28	-.04	**.46**	.05	.58
54	.35	.27	.10	-.16	-.04	**.44**	-.01	.70
43	.26	.15	.02	.01	.08	**.42**	.03	.60
53	.12	.38	-.07	.29	-.07	**.40**	-.13	.71
57	.17	-.21	.00	.18	.13	**.40**	.11	.41
44	.22	.02	.12	.22	-.06	**.40**	.04	.64
14	.08	.09	.07	.20	-.13	.01	**.63**	.69
26	.12	.16	.16	-.10	-.04	.28	**.47**	.77
27	.15	.34	-.08	.15	.08	.05	**.39**	.76
Eigenvalue	19.22	2.08	1.84	1.59	1.23	1.1	1.02	

Table 2. Descriptive Statistics for the Seven Factors

Factor	*k*	*M*	*SD*	Skewness	Kurtosis	α
1. Planning for vocabulary goal	9	3.08	1.06	0.23	-0.12	.92
2. Obtaining and using preferred resources	6	3.38	1.12	-0.11	-0.28	.90
3. Conceptualizing by linking/ combining related vocabulary	7	3.50	1.06	-0.19	-0.10	.90
4. Planning for positive affective strategies	7	3.09	1.00	0.10	-0.10	.89
5. Using auditory sense to understand and remember vocabulary	3	3.70	1.09	-0.07	-0.20	.76
6. Generating and maintaining extrinsic motivation	6	3.22	1.07	-0.17	-0.14	.88
7. Increasing instrumental motivation	3	3.21	1.23	0.02	-0.42	.88
Total		3.27	0.91	-0.18	-0.03	.97

Note. Standard error of skewness = 0.17; Standard error of kurtosis = 0.33.

The seven factors were labeled according to the list of strategies in Oxford (2011). Factor 1 was defined as planning for vocabulary goal achievement (PVGA), because the combination of items in this factor was considered to reflect planning strategies for vocabulary goal achievement. More items concerning planning for cognition (Items 41, 24, 37, 30, 39, and 15) rather than planning for affect (Items 42, 38, and 40) made up this factor, suggesting that the primary function of this strategy is planning for cognition (i.e., setting achievement goal).

Factor 2 was labeled as obtaining and using preferred resources (OUPR). Items that loaded highly on this factor (Items 56, 5, 49, 52, 34 and 48) combined two different predicted latent variables (i.e., seeking resources for cognitive development and increasing intrinsic motivation). All items in this group except item 52 related to learning using preferred materials. This factor may have been a reflection of intentional input seeking, which commonly relates to the use of learners' preferred means to motivate themselves.

Factor 3 was named as conceptualizing by linking/combining related vocabulary (CLRV). The items (Items 21, 31, 16, 18, 22, 33, 10) that loaded on this factor suggested that these items were closely related to one another, based on one common underlying trait, linking.

Factor 4 was defined as planning for positive affective strategies (PPAS). Items concerning planning for affective strategy (Items 11, 13, and 7), intrinsic motivation (item 19), and evaluation of affective strategy (Items 3, 32, and 6) were classified into this factor. This factor was considered as a meta-affective strategy that could affect strategies related to intrinsic motivation.

Items in Factor 5 were concerned with the use of aural techniques. Therefore, this factor was labeled as using auditory sense to understand and remember vocabulary (UASURV). Three items (Items 35, 46, and 50) were factored in this type of strategy. It was indicated that learners in this research were inclined to use this strategy more than any other strategy ($M = 3.70$).

The six items involved in Factor 6 (Items 55, 54, 43, 53, 57, and 44) were associated with extrinsic motivation. Thus, this factor was labeled as generating and maintaining extrinsic motivation (GMEM). This factor might suggest that participants in this study tended to use meta-affective and affective tactics for influencing extrinsic motivation to activate their vocabulary learning in a rather orchestrated way.

Factor 7 contained three items (Items 14, 26, and 27) tasked with

evaluating awareness of using vocabulary to activate learning. This awareness was likely to correspond to the instrumental use of the target language, to consider the major function of two items concerning instrumental orientation. Therefore, this factor was named as increasing instrumental motivation (IIM). Although the loading of Item 27 was .39, the item was retained to interpret this construct.

The reliability of each factor was satisfactory with relatively high, ranging from .88 to .92 except Factor 5 with an acceptable but moderate reliability coefficient (α = .76). The reliability of the questionnaire as a whole was satisfactory (α = .97), indicating that the internal consistency of the constructs as a whole structure was reliable.

Table 3 shows the descriptive statistics for the vocabulary size scores. The average score of the participants in this study was 17.92, which corresponds approximately to a 3600-word item count. A one-way ANOVA showed that the mean of each vocabulary level was significantly different ($p < .001$), indicating that words from the higher levels were more difficult to acquire. Though the mean difference between the 4000-word level and 6000-word level was small, posthoc tests with a Bonferroni adjustment showed that the differences among all three vocabulary levels were significant ($p < .001$).

Table 3. Descriptive Statistics for the Vocabulary Size Test (N = 216)

Level	2000	4000	6000	Total
k	10	10	10	30
M	8.23	5.53	4.18	17.92
SD	1.72	2.64	2.48	5.93
Maximum	10	10	10	30
Minimum	2	0	0	4
Skewness	-1.17	0.10	0.45	0.23
Kurtosis	1.41	-0.87	-0.43	-0.62
α	.65	.75	.68	.86

The reliability of the test as a whole was relatively high (α = .86). However, the reliability of 2000- and 6000-word levels yielded somewhat lower values (α = .65 and .68, respectively) compared with the overall scale value. The moderate Cronbach alpha coefficients were due to a fairly small number of items. The original test had more words to retain higher reliability and validity, but half of the items were eliminated to meet the study's time constraints. Additionally, in order to explore the soundness of the 30 items, an item analysis for the vocabulary test was carried out. It was found that only two items ("cultural" and "salt") had item discrimination values less than .20. Although this shortened test meant that the reliability coefficients were relatively moderate, this result showed that the individual items were effective in evaluating the vocabulary size of the students in this study.

Table 4 provides the inter-correlation of the seven variables and their correlations with vocabulary size score. All the correlations were statistically significant ($p < 0.05$) and small to moderate relationships were found between seven VLS and vocabulary size score. Among the seven variables, OUPR (r = .37), CLRV (r = .45), and IIM (r = .37) showed moderate relationships with the vocabulary size score. The remaining four variables had weak coefficients but were significantly related to the vocabulary size score. The former three types of strategies were considered to be directly linked to vocabulary size. OUPR and IIM were featured by high consciousness of exposure to language by means of tactics to increase intrinsic motivation or instrumental orientation. CLRV involved in a series of linking tactics, some of which could contribute networking of new vocabulary into the existing vocabulary knowledge. On the other hand, it appears that the latter four strategies (PVGA, PPAS, UASURV, and GMEM) are related indirectly to vocabulary size scores due to low correlations. As for UASURV which reflected tactics to use auditory sense, the construct may have been more related to other dimensions of vocabulary knowledge such as the productive facet of vocabulary.

Table 4. Inter-correlations among Seven Latent VLS Variables and Vocabulary Size

Variable	PVGA	OUPR	CLRV	PPAS	UASURV	GMEM	IIM
PVGA							
OUPR	.72						
CLRV	.72	.76					
PPAS	.81	.80	.77				
UASURV	.59	.68	.64	.57			
GMEM	.88	.84	.75	.87	.63		
IIM	.81	.84	.76	.81	.63	.85	
VOCsize	.28	.37	.45	.21	.17	.23	.37

Note. PVGA = planning for vocabulary goal achievement; OUPR = obtaining using preferred resources; CLRV = conceptualizing by linking/combining related vocabulary; PPAS = planning for positive affective strategies; UASURV = using auditory sense to understand and remember vocabulary; GMEM = generating and maintaining extrinsic motivation; IIM = Increasing instrumental motivation; VOCsize = vocabulary size.

Discussion

The results of factor analysis showed that seven factors were extracted from constructs hypothesized from the S^2R model to a reasonable extent. However, there were some discrepancies between the predicted constructs and the yielded constructs. Planning for vocabulary goal achievement (PVGA) comprised items related to planning for cognition and affect (Oxford, 2011). Three items related to affect seemed related to self-regulating capacity in Tseng et al. (2006). Items 42 and 38 manifested planning for curtailing procrastination, which equated to meta-cognitive control (Tseng et al., 2006), while Item 40 was concerned with encouraging learners by thinking in terms of future self-efficacy for a test, which related to commitment control (Tseng et al., 2006). The loading of Item 40 on this factor might mean that self-efficacy for test achievement was more related to EFL learners' strategic planning than extrinsic motivation. Mizumto and Takeuchi (2012) showed that items from meta-cognitive control and commitment control formed one construct (meta-cognitive control) in the Japanese EFL environment. Similarly, items related to the two constructs clustered together in this study, with planning for cognition, which derived from self-management

in Mizumoto and Takeuchi (2009a). The result of this factor seems to suggest that planning for goal achievement in terms of cognition and affect are closely related.

Planning for positive affective strategies (PPAS) manifested a meta-affective concept as contrasted with PVGA. These affective items belonged to planning for affect (Oxford, 2011) or more specifically, a type of intrinsic motivation regulatory strategy, interest enhancement. Learners use this strategy to "increase their immediate enjoyment or the situational interest they experience while completing an activity" (Wolters, 2003, p. 195). A similar construct to PPAS was also reported as satiation control by Tseng et al. (2006). Though items from satiation control are more concerned with eliminating boredom, PPAS consists of tactics related to increasing enjoyment and concentration for vocabulary learning. The combination of items for enhancing learning enjoyment and concentration in PPAS may suggest that these two types of planning are nearly synonymous or at least closely related.

Generating and maintaining extrinsic motivation (GMEM) seems to be related to extrinsic motivation for external stimuli (e.g., importance of test and rewards after studying). In addition to extrinsic motivational items, this construct contains meta-affective items linking to extrinsic motivation. Thus, GMEM might be regarded as orchestrating strategy use for affect in the S^2R model. This construct appears to be more complex for some items (Items, 53, 54 and 44) loaded on other constructs such as PVGA, OUPR, and PPAS.

Obtaining and using preferred resources (OUPR) involves seeking resources for cognition, and increasing intrinsic motivation. Although it was not predicted that these two strategies would be combined, this outcome is understandable because learners may be more intrinsically motivated when they use their preferred resources. When learners seek resources for learning, they are likely to look for what suits their preference unless there are specific resources available. If this tendency exists, the items in this construct could also be interpreted as "using and obtaining resources for affect" in the S^2R model. Therefore, these predicted items for affect and cognition may not have formed separated constructs. Distinguishing meta-affective and meta-cognitive strategies in PVGA and OUPR is a difficult issue. Based on the results of EFA, it may be argued that these regulatory strategies belong to the same self-regulatory system. Wolters (2003) stated that although regulations for cognition and motivation are conceptually different, they exist under the same regulatory system.

Items 14, 26, and 27 are related to instrumental motivation (IIM) and ask learners if they motivate themselves by thinking vocabulary learning helps their future career and study. It was rather unexpected that Item 27 was loaded on IIM because the item adopted from Mizumoto and Takeuchi (2009a) was supposed to be an item related to a meta-cognitive construct learners use to seek sources for learning vocabulary.

Conceptualizing by linking/combining related vocabulary (CLRV) appears as a combination of conceptualizing broadly by linking and using senses to understand and remember by visualizing (Oxford, 2011), corresponding to association and imagery in Mizumoto and Takeuchi (2009a). These two types of strategies are thought to belong to either memory strategies (Schmitt, 1997) or encoding strategies (Gu & Johnson, 1996). In this study, items characterized by association and imagery did not appear as distinct constructs as in previous studies in the Japanese EFL context (e.g., Horino & Ichikawa, 1997; Maeda et al., 2003, Mizumoto & Takeuchi, 2009a). Likewise, items for writing tactics did not comprise a predicted latent variable, and they loaded on theoretically irrelevant factors or loaded on two factors. Thus, these items were excluded, leading to a smaller number of cognitive strategies.

Using auditory sense to understand and remember vocabulary (UASURV) contained three items related to the use of auditory tactics. This factor reflected using auditory sense in the S^2R model and oral rehearsal in Mizumoto and Takeuchi (2009a). One difference from the original subscale in Mizumoto and Takeuchi was that shadowing replaced verbal repetition. The discrepancies between this construct and oral rehearsal arose from the reduction of items deviating from normality. This deviation might be caused by the application of a six-point Likert scale instead of the five-point Likert scale used by Mizumoto and Takeuchi (2009a), as well as by differences in the proficiency of participants. As proficiency level is known to affect VLS use in past findings (Nyikos & Fan, 2007), and Japanese learners tend to use more rehearsal strategies (Schmitt, 1997), it might be the case that some tactics used with rehearsal were more inclined to be common among participants with higher English proficiency.

The relationships between the seven variables and vocabulary size were investigated to answer the second research question. All seven latent variables yielded in this study significantly related to vocabulary size score. Among them, obtaining and using preferred resources (OUPR: $r = .37$), conceptualizing by linking/combining related vocabulary (CLRV:

r = .45), and increasing instrumental motivation (IIM: r = .37) had moderate correlations with the score. Although the correlations are not strong, correlations from .3 to .5 are considered to be meaningful in the field of applied linguistics (Dörnyei, 2007).

OUPR and IIM derived from input-seeking (Mizumto & Takeuchi, 2009a) and the S^2R model had direct relationships with vocabulary size. Previous findings have shown the link between standardized English proficiency test (TOEIC) scores and input-seeking strategies (Mizumoto & Takeuchi, 2009a), and the impact of language exposure strategies on vocabulary knowledge (Tanaka, 2012). Although the construct manifesting input-seeking in previous studies (e.g., Mizumoto & Takeuchi, 2009a; Tanaka, 2012) was further divided into two constructs via intrinsic and instrumental motivation in this study, the significant correlations between both constructs with vocabulary size scores adds further support for the significance of this type of strategy in the Japanese EFL context.

OUPR and IIM were significantly correlated to vocabulary size. This may mean that whether instrumental or intrinsic motivation is involved, conscious attempts to seek resources for learning could expand learners' vocabulary size. Both types of motivational strategies could enhance needs of learning vocabulary (Laufer & Hulstijn, 2001). Previous findings have suggested that there may be a link between instrumental motivation and vocabulary learning (Gardner & MacIntyre, 1991). Hence, encouraging the development of both types of motivation may lead to language exposure with better learning by means of needs, which contributes to qualitatively or quantitatively rich vocabulary learning. As Schmitt (2010) emphasized, "exposure" to language is an important factor for gaining vocabulary knowledge.

CLRV (r = .45) is another strategy that has a direct and meaningful relationship with vocabulary size scores. Previous research has reported the significant effect of this type of strategy on achievement tests (Horino & Ichikawa, 1997). Tanaka (2012) has shown that this type of strategy is effective on vocabulary knowledge as a part of deep processing strategies. Mizumoto and Takeuchi (2009a) have shown that association strategies have only a marginal relation with TOEIC (r = .13). When they conducted an explicit strategy instruction, their participants in the experimental group came to use significantly more association than oral rehearsal and input-seeking (Mizumoto & Takeuchi, 2009b). Their instruction led to a significantly higher vocabulary size test score in the

experimental groups. Therefore, the use of association may be one of the significant variables involved in achieving higher vocabulary size test scores. In sum, it appears that strategies related to linking are effective for increasing vocabulary size, although they may not necessarily lead to increased performance in each aspect of language ability.

Strategies related to planning (i.e., PVGA and PPAS), and GMEM have significant but weak correlations with vocabulary size scores. Since PVGA, PPAS and GMEM have strong relationships with other strategies (except UASURV), it is reasonable to assume that their relationship to vocabulary size is indirect at best. This might explain inconsistent outcomes in relation to the link between similar constructs and learning achievement in previous studies (e.g., Wolters, 1998; Zimmerman & Martinez-Pons, 1986, 1990). The positive and strong links of PPAS with other strategies are understandable, as tactics from the construct have been found to positively affect engagement and willingness to manage a task (Sansone, Wiebe, & Morgan, 1999). PVGA, PPAS, and GMEM may influence other strategies strongly. Consequently, a greater use of strategies directly related to vocabulary size may help to expand learners' vocabulary size. These strategies are likely to be an integral part of self-regulated vocabulary learning.

UASURV has the lowest correlation with vocabulary size score (r = .17). This is consistent with the low correlation found between oral rehearsal and TOEIC scores in Mizumoto and Takeuchi (2009a). However, other studies in the university EFL context have indicated that using auditory sense or rehearsal including aural tactics does not significantly predict vocabulary knowledge (Tanaka, 2012) or learning achievements (Horino & Ichikawa, 1997). The weak correlation may indicate, if anything, that richer vocabulary knowledge or higher proficiency affect the use of tactics related to auditory sense.

Conclusion

While this study was able to confirm some of the findings of previous research, a number of its limitations need to be recognized. First, since the participants of this study included only Japanese EFL university students, the results cannot be generalized to learners from different populations. Second, some items on the questionnaire did not cluster together as expected, and adoption of only half of the VLT items led to lower reliability. Future research needs to address these issues.

The implications of this study include (a) the importance of affective strategies in initiating or invigorating vocabulary learning, (b) the potential of linking tactics for increasing vocabulary size, and (c) the need to teach strategies for vocabulary learning. Initially, this study suggested the importance of affective strategies. Increasing instrumental motivation and intrinsic motivation may engage learners in proactive vocabulary learning, thereby ensuring language exposure. These strategies, as well as strategies related to interest and extrinsic motivation enhancement, may qualitatively and quantitatively interact with direct cognitive strategies.

These self-regulated motivation strategies are important because motivation to learn vocabulary is not likely to remain static (Tseng et al., 2006; Tseng & Schmitt, 2008) due to changes in learners' values, goals, and feelings over time (Sansone & Thoman, 2006). When learners are confronted with difficulty in learning, increasing motivation by self-regulation can help them to overcome the loss of motivation. Furthermore, if such motivational strategies are employed routinely and learners can achieve high motivation over time, the learning outcomes will be more promising for increased attention, spontaneous choices of relevant tasks, effort and persistence in their learning processes (Zimmerman, 2011).

The potential of linking tactics for affecting vocabulary size needs to be emphasized. Among the seven constructs of VLS, combining and linking related vocabulary correlated most strongly with vocabulary size scores. Although this study did not show the causal direction, the impact of the strategies on vocabulary size is predictable from previous findings (e.g., Mizumoto & Takeuchi, 2012; Tseng & Schmitt, 2008). This means that when learners are trying to increase their vocabulary size, learning new words by the use of linking/combining related vocabulary is likely to be more effective than some of the other strategies included in this study. Additionally, based on the strong correlations between strategies regarding self-regulation and this construct, it can be inferred that the more learners self-regulate their learning by strategic planning or motivation enhancement, the more they will associate a new word with related words when learning new vocabulary items.

Language learners stand to gain significantly from an approach that focuses on the development of linking or combining skills. The support for this potential also comes from previous research, including Mizumoto and Takeuchi (2009b) and Tanaka (2012), that addressed the effects of

teaching VLS with meta-cognitive awareness in the Japanese EFL environment. Bearing in mind methods of successful instruction (meta-cognition awareness and sufficient time; e.g., Macaro, 2006), VLS should be actively taught. One suggestion is that teachers prioritize teaching association because it correlates directly with the growth of vocabulary size. Elementary or low-intermediate proficiency learners benefit more from associational learning tactics. It is important for learners to use preferred resources and increase instrumental motivation. Taking advantage of input may not be really effective for learners at beginner's level until they reach some threshold level of vocabulary knowledge and language ability. However, after learners fulfill these conditions, language exposure according to their need and preference is very likely to benefit them in terms of increased learning opportunities and motivation.

Strategies related to self-regulation are worth teaching because they can help learners to become autonomous. In addition to the former two motivational strategies, planning for setting cognitive goals and planning for interest enhancement, increasing extrinsic motivation may play a significant role in promoting learners' concentration and effort to learn over time. Not only do these self-regulated VLS promote learners' autonomy for vocabulary learning, but they also help learners to achieve greater vocabulary gains.

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Appendix A

Questionnaire Used in This Study (Originally in Japanese)

1. I learn vocabulary by repeatedly writing them.
2. I learn vocabulary by repeatedly verbalizing them.
3. When I study vocabulary, I have ways to avoid boredom.
4. I try to put myself in a situation where I have to study vocabulary.
5. I try to learn vocabulary by learning words that are related to topics of my interests.
6. When I learn vocabulary, I have techniques to make me interested in target words.
7. Before I start vocabulary learning, I decide words I especially want to remember.
8. I try to expose myself to English by watching TV, listening to radio, surfing the net, listening to songs, and watching movies.
9. I learn vocabulary by writing sentences that target words are inserted.
10. I memorize a word by linking it with words with similar sound.
11. I try to come up with ways to enjoy vocabulary learning.
12. I learn vocabulary by silently repeating them.
13. When learning vocabulary, I think about techniques to keep my concentration till I achieve my goals.
14. I motivate myself for vocabulary learning by thinking vocabulary I learned will help me in my future job.
15. I learn vocabulary by making a plan to learn them efficiently.
16. When I try to remember vocabulary, I imagine whether the meaning of the word is negative or positive.
17. I learn vocabulary by associating to words I already know.
18. I learn vocabulary by associating to word forms I already know.
19. I try to enjoy vocabulary learning by taking enjoyable learning approaches.
20. Even when I am not in the mood to learn vocabulary, I have ways to keep going.
21. When I try to remember vocabulary, I associate it with the synonyms (e.g., begin and start) or antonyms (e.g., positive and negative) I already know.
22. I learn a word in addition to its synonym, and antonym.

23. I try to learn vocabulary as fast as I can so that I can achieve the goal I set to learn them.
24. I regularly plan to take time to review the vocabulary I learned.
25. I take a memo when I come across a word I want to learn.
26. I motivate myself for vocabulary learning by thinking vocabulary I learned will help my study in the future.
27. I try to seek the learning environment so as to make me have intention of using vocabulary.
28. I learn vocabulary by taking an image from a word meaning.
29. I learn vocabulary through dictation.
30. I consciously set aside time to study vocabulary in order to prepare for tests (such as quizzes at school, TOEIC, TOEFL or Eiken: English Proficiency Test).
31. I memorize a word by linking it with words similar to its meaning.
32. When I feel stressed about vocabulary learning, I know how to reduce this stress.
33. When I try to remember vocabulary, I make a mental picture of what can be associated with a word meaning.
34. I try to have fun by learning vocabulary related to my interests.
35. I learn vocabulary by pronouncing a word.
36. I learn vocabulary by imagining spellings in my head.
37. I keep a vocabulary book or word list to check the vocabulary anytime I wish.
38. In order to achieve a goal, I try to ignore temptations.
39. I try to increase opportunities to learn vocabulary.
40. I motivate myself in learning vocabulary by thinking about getting a good score on a test.
41. I regularly plan to take time for vocabulary learning.
42. I plan my strategies to keep me from procrastinating my vocabulary learning.
43. I motivate myself for vocabulary learning by thinking about the importance of English tests.
44. When learning vocabulary, I have special techniques to keep my concentration.
45. I learn vocabulary by writing them down.
46. When I try to remember vocabulary, I use speech shadowing techniques.
47. I learn vocabulary by associating words in a chart.

48. I try to expose myself to English vocabulary by seeking good learning materials for me.
49. I motivate myself for vocabulary learning by using music, books, movies or videogames I like.
50. When I try to remember vocabulary, I read sample sentences out aloud.
51. I motivate myself in learning vocabulary by imagining what I can do if I become proficient in English.
52. I try to expose myself to English vocabulary by reading or listening a lot.
53. I have ways to have fun in learning when studying vocabulary.
54. I motivate myself by imagining joy I can feel if I become proficient in English.
55. I think about how to control my mood and continue vocabulary learning when I feel like giving up.
56. I motivate myself for vocabulary learning by activities I like (e.g., hobbies such as travel, communication, reading, etc.).
57. I motivate myself for vocabulary learning by thinking about rewards after learning.

Appendix B

Vocabulary Size Assessment (Adopted from Mizumto & Simamoto, 2008)

1. 文化的な, 栽培の
   (A) developing
   (B) cultural
   (C) sensitive
   (D) distant
2. 塩
   (A) league
   (B) clerk
   (C) salt
   (D) medicine
3. 慰め(なぐさめ), ～を慰める
   (A) estimate
   (B) post
   (C) brush
   (D) comfort
4. 田舎
   (A) crew
   (B) countryside
   (C) achievement
   (D) circumstance
5. 大海, 大洋, 広がり
   (A) ocean
   (B) ear
   (C) tourist
   (D) wealth
6. 策略, いたずら
   (A) author
   (B) pollution
   (C) task
   (D) trick
7. 政策, 方針
   (A) weapon
   (B) restaurant
   (C) breath
   (D) policy
8. 機能, 機能する
   (A) purchase
   (B) scream
   (C) function
   (D) glance
9. 取り扱い, 治療
   (A) factory
   (B) treatment
   (C) committee
   (D) cake
10. 反応, 反作用
    (A) lake
    (B) pen
    (C) reaction
    (D) leaf
11. 除去, 取り除くこと
    (A) reference
    (B) hostility
    (C) removal
    (D) workshop
12. 白紙の, 空白の
    (A) blank
    (B) relevant
    (C) digital
    (D) increasing
13. 終点の, 末期の, 終着(駅)
    (A) waiting
    (B) civilian
    (C) socialist
    (D) terminal
14. 貨幣の, 金銭上の, 金融の
    (A) sufficient
    (B) monetary
    (C) structural
    (D) chronic

15. 上昇, ～を押し上げる, ～を増加する
    (A) boost
    (B) label
    (C) collapse
    (D) venture
16. ～を告発(告訴)する、～を非難する
    (A) resign
    (B) entitle
    (C) accuse
    (D) consult
17. 驚くべき, 不思議な, すばらしい
    (A) marvelous
    (B) dependent
    (C) administrative
    (D) considerable
18. ～を調べる,～を調査する
    (A) implement
    (B) investigate
    (C) concede
    (D) acknowledge
19. 仲裁, 介入(かいにゅう), 干渉
    (A) category
    (B) striker
    (C) intervention
    (D) helicopter
20. 宿泊施設, 収容能力, 便宜(べんぎ)
    (A) accommodation
    (B) constraint
    (C) acceptance
    (D) insurance
21. ～をはっきり発音する, ～をはっきり述べる
    (A) denote
    (B) bake
    (C) soften
    (D) articulate
22. 占有者, 居住者, 乗客
    (A) scarf
    (B) morale
    (C) advent
    (D) occupant
23. 広大な, 豊富な
    (A) inclined
    (B) ample
    (C) destructive
    (D) enjoyable
24. 避けられない, 必須の, 強制的な
    (A) imperative
    (B) defective
    (C) hybrid
    (D) solitary
25. 放射性の, 放射能のある
    (A) radioactive
    (B) behavioral
    (C) papal
    (D) architecture
26. 賛辞, お世辞, ～にお世辞を言う, ～を誉める
    (A) shudder
    (B) relish
    (C) plague
    (D) compliment
27. 獰猛(どうもう)に, 猛烈に
    (A) casually
    (B) plainly
    (C) fiercely
    (D) promptly
28. 転倒する, 転ぶ,～を倒す
    (A) resent
    (B) tumble
    (C) fascinate
    (D) inject

29. ～を訂正する, ～を変える,～を修正する
    (A) destine
    (B) revise
    (C) compute
    (D) withhold
30. 人質, 人質の状態
    (A) hostage
    (B) innocence
    (C) consortium
    (D) marathon