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This paper attempts to establish the country-by-country SILL (Strategy Inventory for Language Learning) norms advocated by Oxford and Burry-Stock (1995). First, a brief description of the SILL, a self-report questionnaire, is provided, and empirical studies indicating its drawbacks are summarized. Then we report an analysis that shows the underlying factor structure of the SILL when administered to 200 college students studying English as a Foreign Language in Japan. In this analysis, the universality of the SILL is challenged, and also, a suggestion is made that not only country-by-country SILL norms but also proficiency level-by-level norms should be established. After the factor analysis, relationships are sought, using a multiple regression procedure, between the factors found and EFL proficiency measured by the TOEFL. The results provide theoretical implications for further improvement of the SILL (especially concerning the validity issue) as well as for the development of sound strategy training programs in the EFL environment.

1. Introduction

One of the most widely and often employed ways to assess the use of language learning strategies (LLS) is the Strategy Inventory for Language Learning (SILL: Oxford, 1989b). The SILL is a 50-item self-report

instrument (questionnaire). In the SILL, subjects are given a list of LLS in non-technical terms, and asked to indicate, one by one, the degree they use them in their language learning activity, answering on a frequency scale of one (never) to five (always).

The proponents of the SILL insist that the inventory is quick and easy to administer, and may be the most cost-effective mode of strategy assessment. The reliability of this inventory, they maintain, is quite high, ranging somewhere between .85 and .91 (Cronbach alpha) for the ESL/EFL version. Its validity is said to be satisfactory in terms of construct and contents. Also, the SILL avoids the problem of a students' desire to give the 'right answer' to please teachers. (*e.g.*, Oxford, 1996a, 1996b; Oxford and Burry-Stock, 1995; Yang, 1992).

Some researchers, however, argue that the SILL is susceptible to the influence of cultural and environmental differences. Takeuchi (1993) used multiple regression analysis and found that the use of some LLS as reported on the SILL negatively predicted language achievement of Japanese college students studying English.¹ He ascribed these negative relationships to the possible influence of Japanese culture and its expectations toward language learning. LoCastro (1994) insisted, based on her observational study, that differences in instructional settings (*e.g.*, student-teacher ratio) change the learning environment and thus potentially the LLS employed. In this connection, Takeuchi (1998) proved that the SILL was prone to be influenced by the difference between the ESL and the EFL learning environments. He compared the SILL scores of Japanese learners of English studying in the US (ESL) and those of the same subjects after returning to Japan (EFL). Once students came back to Japan after a three-week stay in the US, Takeuchi found that the frequency of the use of seven LLS had dropped significantly, while the use of three LLS increased dramatically (all at $p < .05$ in nonparametric sign-tests).² Also, Kimura and Oda (1997), applying the fuzzy-set concurrent rating (FCR) method to the SILL, found that several LLS listed in the inventory were not suitable for Japanese EFL students.³

Recently, Oxford herself (Oxford and Burry-Stock, 1995: 18) has admitted the existence of cultural and environmental influences on the SILL, and called for the creation of country-by-country SILL norms

based on large-scale factor analyses.

The purpose of this article is two-fold: (1) to provide data to determine the underlying factor structure of the SILL when applied to Japanese college students studying English; and (2) to investigate the possible relationships between the factors found and EFL language proficiency measured by the Test of English as a Foreign Language (TOEFL).

2. Experiment

2.1 Subjects

Subjects of the experiment were 200 Japanese college freshmen studying English as a foreign language. Sixty-three of them were female students. All the subjects fell in the age range between 18 and 22. They had studied English for at least six years in junior and senior high schools.

Returnees from English speaking countries and those who had gained an exceptionally high/low score in the TOEFL were excluded from the following analyses.⁴

2.2 Method

To measure the use of LLS, the SILL for ESL/EFL learners (*Ver.7.0*) was used. The inventory was administered in April, at the beginning of the freshman's first semester. To ensure that every subject understood the exact meaning of each questionnaire item, questions by the subjects during the administration were encouraged. Answers were given not to the individual who had asked a question but to all subjects taking the inventory.

To assess the subjects' English proficiency, we used the TOEFL. The test was given also in April. The total score of the TOEFL was made up of the scores of the three subsections: listening, structure, and reading. We utilized the total scores as well as the scores of the subsections in the regression analysis mentioned below.

To determine the underlying factor structure, a six-factor, principal components, Varimax (orthogonal) solution was chosen. The number of factors, *i.e.*, six, was decided by using a scree plot in which the eign

values and the cumulative contribution ratio were taken as the signals of the threshold. This solution accounted for about 40% of the variance in our data. Factor loadings greater than or equal to .40 were considered to be acceptable for simple structure.

We used multiple regression analysis in interpreting the relationships between the factors found and English proficiency measured by the TOEFL. The stepwise method was chosen for the selection of predictor variables. In addition, due caution was exercised to minimize the effect of multicollinearity (Norusis, 1993).

3. Results

3.1 Results of the Factor Analysis

Table 1 shows the six explanatory factors found in our analysis. The primary factor is learning environment organizing strategies, which was made up of several cognitive (Nos. 14 and 16) and metacognitive strategies (Nos. 30-38) in the SILL. This factor explained about 12% of the variance. A memory strategy (No. 4), some cognitive (Nos. 18, 22, 23), and compensation strategies (Nos. 24, 27) in the SILL comprised the second factor found in our analysis. The factor, top-down processing strategies, accounted for about 7% of the variance. The third factor, risk-taking/management strategies, consisted of cognitive (No. 14), compensation (Nos. 28, 39), affective (Nos. 40, 42), and social (No. 49) strategies in the SILL. About 6% of the variance was explained by this factor. Affective (No. 44) and social (Nos. 46-48) strategies in the SILL comprised the fourth factor (*i.e.*, interactional strategies), which accounted for 5.7% of the variance. About 5% of the variance was explained by the fifth factor, called phonetic and prosodic strategies.

This factor was made up of memory (No. 5), and cognitive (Nos. 11, 12, 15) strategies in the SILL. The last factor is analogical/analytic strategies.

A memory (No. 9) and two cognitive (Nos. 19, 20) strategies in the SILL comprised this factor.

The present factor structure was markedly different from the one underlying the SILL *Ver.* 7.0 (Oxford, 1989), or from the one reported in Oxford and Burry-Stock (1995).⁵ In the Oxford and Burry-Stock

study, for example, nine factors comprised the underlying structure. Among these factors, they reported, active & naturalistic language use, metacognitive planning, and sensory memory strategies were important in explaining the variance. Affective and social strategies as a combination, affective strategies alone, reflective strategies, formal oral practice, compensation and analysis, compensation in speaking, social strategies, visual memory, attention to key details, and general memory strategies were also reported to be common to their data sets.⁶ In our study, however, original factors such as top-down processing, and risk-taking/management were more important, though the use of learning environment organizing strategies, which are roughly equivalent to metacognitive planning strategies in the Oxford and Burry-Stock study, was on the top of the list. In addition, strategies concerning memory/mnemonics did not comprise one distinctive factor in our study, but diffused across several factors. On the contrary, strategies concerning phonetic/prosodic aspects of language formed one unique factor as was not the case with the Oxford and Burry-Stock's. These differences indicate that there might be problems in the SILL in terms of universality, and support the argument for establishing country-by-country SILL norms.

Also, the factor structure found in the present study was different from that of the Japanese university EFL students reported in Oxford and Burry-Stock (1995), in which active language use (23.3%), sensory memory (6.7%), and metacognitive/social/affective strategies (5.0%) were important.⁷ In our study, however, neither strategies concerning active language use nor strategies concerning sensory memory formed a distinctive factor. These discrepancies might be attributed to differences in the subjects' English proficiency between the two studies. If this proficiency-based explanation is correct, then we might need to establish not only country-by-country SILL norms but also (proficiency) level-by-level norms.

3.2 Results of the Regression Analysis

Possible relationships between the factor scores (calculated based on the factor analysis) and the TOEFL scores obtained were sought through

the use of stepwise multiple regression procedure. The results of the analysis are found in Table 2. Some factors were significantly related to

Table 1. Results of the Factor Analysis and a Comparison with the SILL

No.	Name	Categories in SILL	SILL Nos.	Ratio *	Remarks
Factor 1	Learning Environment Organizing Strategies	Cognitive, Metacognitive	14,16,30,31, 32,33,34,35, 36,37,38	12	N.A.
Factor 2	Top-Down Processing Strategies	Memory, Cognitive, Compensation	4,18,22,23, 24,27	7.1	N.A.
Factor 3	Risk-Taking/ Management Strategies	Cognitive, Compensation, Affective, Social	14,28,39,40, 42,49	6	42 is Negative
Factor 4	Interactional Strategies	Affective, Social	44,46,47,48	5.7	N.A.
Factor 5	Phonetic/ Prosodic Strategies	Memory, Cognitive	5,11,12,15	5	N.A.
Factor 6	Analogical/ Analytic Strategies	Memory, Cognitive	9,19,20	4.2	N.A.

* Ratio: Contribution Ratio (%)

the total scores, and/or the subscores of the TOEFL. In the listening section, factors 3 (risk-taking), 2 (top-down) , and 6 (analytic: in the order that each factor entered in the equation) explained about 12% of the variance of the scores. Among the three, factor 6 was negatively related to the scores of the section, which means the more often the subjects analyzed the input, the lower scores they gained in the listening section. This result can be explained by the tight time constraint placed on the subjects in the listening comprehension section of the TOEFL.

Table 2. Results of the Regression Analysis

TOEFL	R ² Increment	Factors* ($p < .05$)	Remarks
Listening	11.7%	Factors 3, 2, 6	Factor 6 is negative
Structure	14%	Factors 2, 3, 1	N.A.
Reading	13%	Factors 2, 3, 1	N.A.
Total Score	21%	Factors 2, 3, 1, 6	Factor 6 is negative

*In the order that factors entered in the regression equation.

As for the structure section, factors 2 (top-down), 3 (risk-taking), and 1(organizing: in the order that each factor entered in the equation) were positively related to the scores. Some 14% of the variance can be explained by the use of these three factors. The same three factors were also positively related to the scores of the reading section. Approximately 13% of the variance was accounted for by their use.

Lastly, four factors (2, 3, 1, and 6: in the order that each factor entered in the equation) were significantly related to the total scores of the TOEFL. Among them, factor 6 was negatively related. This negative relation indicates that the validity of the SILL, which is supposedly made up of "good" language learning strategies only, is questionable when

applied to Japanese learners in the EFL environment.

Factors 4 (interactional) and 5 (phonetic) were not related either to the scores of the subsections or to the total scores of the TOEFL. This may be because factors 4 and 5 were related to speaking ability, and this ability was not measured by any of the three subsections of the TOEFL test.

4. Concluding Remarks

Before concluding, some limitations of our study should be pointed out. First, the number of subjects (N=200) was not sufficiently large for a factor analysis. Replication studies on a larger scale, therefore, are expected to be conducted. Second, the TOEFL might not have been a good device for measuring some of our subjects' proficiency. In replicating, a measuring device which is more tailored to the proficiency level of the subject population should be used. Third, although we did our best to control the variables affecting the use of LLS, we have to admit that some of them might have influenced the results of our study.⁸

With these limitations in mind, we would like to summarize our findings: In our factor analysis, we found that six factors comprised the underlying structure of the SILL for ESL/EFL version when administered on Japanese college students learning English. The structure was markedly different from those reported in previous studies. This finding cast some doubts on the universality of the SILL, and reinforced the contention that country-by-country SILL norms should be established. The factor structure found in our study was also different from that of the Japanese college students reported in Oxford and Burry-Stock (1995). This difference might indicate that we need to establish SILL norms not only on a country-by-country basis but also on a proficiency (level-by-level) basis.

Our regression analysis provided us with the data in which one factor negatively predicted the achievement of the TOEFL and its subsection. This finding might threaten the validity of the SILL, which is supposed to include, by its nature, good learning strategies only. Based on the regression analysis, we also described the relationships between the six factors found and the subjects' observed EFL proficiency. This

description can be of some help in the development of sound strategy training programs in the EFL environment.⁹

Notes

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1. Takeuchi (1993) found negative relations 1) between three LLS (Nos. 42, 30, 47: in the order that each strategy entered in the equation) in the SILL and the CELT (Comprehensive English Language Test) listening scores ; 2) two LLS (Nos. 30, 28) and the CELT grammar scores , 3) two LLS (Nos. 49, 9) and the CELT vocabulary scores, and 4) four LLS (Nos. 49, 6, 43, 30) and overall EFL proficiency measured by the CELT.

2. According to Takeuchi (In press), the use of strategies Nos. 1, 10 and 20 in the SILL increased, while that of 14, 17, 26, 30, 45, 46, and 47 decreased (all at a significant level).

3. Kimrua and Oda (1997), using the FCR method which is sensitive to contradictory answers in inventories, indicated that five strategies (Nos. 5, 6, 22, 33, and 46) in the SILL were unfit for Japanese EFL learners to answer. They argued that some Japanese EFL learners had little or no hands-on experience of these SILL items and therefore tended to answer at random.

4. The average score of the TOEFL at this administration was 410 (SD=40). Subjects who gained more than 550 or less than 330 were excluded from the analyses. In all, eleven subjects were dropped from the data set.

5. In the standard SILL (*Ver.* 7.0 for ESL/EFL; 1989b), each part of the

SILL seems to represent the factor structure. The six factors are named memory, cognitive, compensation, metacognitive, affective, and social strategies respectively.

6. Oxford and Burry-Stock (1995) compared six data sets. They included Puerto Rican ESL, Taiwanese EFL, Mainland Chinese EFL, Japanese EFL, Egyptian EFL, and American Combined ESL data.

7. Oxford and Burry-Stock (1995) analyzed Watanabe's (1990) data in which 255 university EFL students in Japan were the subjects. Nine factors (and contribution ratio) reported were active language use (23%), sensory memory (6.7%), metacognitive/social/affective (5%), compensation & analysis (3.8%), formal oral practice (3.5%), affective (3.3%), compensation in speaking (2.8%), attention to key details (2.6%), and analysis & anxiety (2.5%).

8. See, for example, Green and Oxford, 1995; Oxford, 1989a; Takeuchi, 1990 for the effects of the variables on the LLS use.

9. See, for example, Bull (1997), Ely (1994), Takeuchi (1998) and Thompson and Rubin (1996) for strategy training.

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