CFA Analysis of the Second-Language Learning Strategies Used among University Students in China

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Abstract
Learning strategies are always discussed of its importantance on impacting L2 language learning. SILL is the most commonly used to study students' language learning as it also provides to teachers and adminstrators an efficient index to understanding their students and improve English programs. This study aims to study a group of 577 somophore students from a 4-year comprehensive university in China. Confirmatory Factor Factor (CFA) of Structure Equation Model (SEM) is used to see how the China university students adapting their strategies into their English learning. The results show that the compensation strategy was most used among the study group.The CFA model of the study group was at stastically significant level of .05 (2-tailed). The future study should link SILL inventory, personality factor, learning environment, and students' English proficiency to see how language strategies impacting on efficiency of learning English.

Keywords: Strategy Inventory for Language Learning (SILL), Confirmatory factor analysis (CFA)

1. INTRODUCTION

Language learning strategies are being identified as distinct behaviors and mental processes used among learners to help assist language acuisition (Park, 1997). Various studies have proved the language strategies are greatly impacting on learning L2 (Bialystok, 1981; Chamot & Kupper, 1989; Cohen, 1987).Good language learners are being identified as the following: active and accurate guessers, strong-motivated communicators, mentally-independent individuals, brave persons to making mistakes, persons tend to analyzing language-patterns, and enjoying taking any opportunities to use the language, monitoring others' talks, and paying close attentions on meanings (Oxford, 1994; Rubin, 1975). However, Cohen (1987) aruged that Rubin (1975) failed to take into individual

difference into language learning process. Cohen (1987) offered a more comphrehensive way to understand a variety of language learning strategies adapted among different individuals. The following table is classification and examples of learning strategies suggested by Cohen in 2003. The table is to giving a clear and better understanding of how language skills cooresponding to the learners' goal and functions.

Strategy Inventory for Language Learning (SILL) are one of the most popular measure of language stratregies; there are six learning strategies identified as memory, cognition, compensation, metacognition, affection, and social strategies. SILL has been commonly used to study L2 learners' overall learning strategy use, the relationships of strategies used and L2 proficiency, the factors relating to learners' choice of adopting different strategies, and language training curriculum (Green andOxford, 1995; Hong-Nam andLeavell, 2004; Nisbet et al., 2005; Nyikos and Oxford, 1993; Park, 1977, 2011; Yang, 1999). SILL was being examined and proved its fair reliability with an acceptable alpha value of .60 and .70 in most of the previous researches (Hair et al., 1998; Landau and Everitt, 2004; Park 2011). Hence, SILL is used for this study to study the group of university students in China.

This study is aiming to find out how the language strategies used among university students in China. The result analysis is to give clear evidence to improve the English learning. The adapted/shorten survey was given to the enrolled students at Dalian University in December 2011. English learning has become significantly important to Asian students as for the important index of their future career and academe studies. Most students in China have started learning English since of their first grade of elementary school education; however, it seems to not giving a holestic view of understanding how the students learning English at different various stages. The article is trying to provide a view of China college students' language learning strategies from a sample of university students. Some of general English-learning issues in China are students may be inferred from the study results.

2. PROCEDURE

2.1 Participants

Six hundred fifty (650) students enrolled at Dalian University (DU), Laoning Provience, China at the fall semester of 2011 were being invited to the SILL study. The students, aged from 19 to 21, were taking sophomore English classes, a required course, taught by the faculty of English College at DU. The participating students were from various academic fields at the universities. After deleting invalid data, there were 577 students (325 females, 228 males, and 22 missing data) completed the SILL inventory. The study students showed their great interest to studying English (112/19% no interest; 463/81% with interest).

Students' attitude toward importance of English are not very important (10), fairly important (184) and very important (358), as 98% of the study students considering English is important to their future study and career.

2.2 Instrument

The SILL inventory (Oxford, 1990) contains 80 items under six learning strategies: memory, cognition, compensation, metacognition, affection, and soicalization. It is a structured and self-reported questionnaire allowing language learners check specific language strategies often used by themselves. It also serves an effective tool for teachers and program designers to review their students' L2 learning efficiency (Oxford, 1990). As the original version of SILL with 80 items were considerated too many for students completing the inventory. Also the SILL inventory is given to Chinese students, the revised Chinese version of SILL was being adapted. In order to increasing the survey-completation rate, the shortern version was down to 34 questions instead of 80 questions. The 34 selected questions were being chosen by shorter descriptiveand precise wording, which it contains Memory stretagy (6), Cognition strategy (6), Compensation strategy (5), Metacognition strategy (6), Affective strategy (5), and Social strategy (6). The selection of 34 chosen questions on the revised SILL for the study was tested significantly through a pretest of 50 students at a private four-year technology university in Taiwan. Table 2 listed the correlation values among the six language-learning strategies are greater than .5 which they all shows a good connecting to each other, which it shows a good reliability of the study model.

3. DATA COLLECTION AND ANALYSIS

3.1 Validation of the study model and the revised questionnaire

The data were collected through the faculty of English College at the university whereas their sophomore English classes as one of required courses for all undergraduate study at the university. When the surveys were being collected, the data were being coded into SPSS 20 program for analysis. The reliability and correlations among the construsts were examined to test classification system presenting the SILL. Two learning strategy models were compared and tested by performing a maximum likelihood CFA. AMOS 20 is being used to demonstrate CFA of the study models.

Model 1: The 34 items of the revised SILL consist of a single construct that is sufficient to account for language learning strategies.

Model 2: The 34 items of revised SILL consist of six learning strategies (construct): memory (6 questions), congnition (6 questions), compensation (5 questions), Metacognition (6 questions), affection (5 questions) and socialization (6

questions).

Though both models show good statistic model fit, Model 2 has a better model fit over Model 1. Hence, the model two is taken to the study model for the following statistic analysis.Regression among L2 six langauge-learning strategy of the study model shows fairly good loading as all the learning strategies as good index to study students' L2 language learning efficiency (see Table 4). The interal consistancy reliability of the study was determined by an acceptable Cronbach's alpha value of .60 or .70 (Hair et al., 1998; Landau and Everitt, 2004; Park,1997).

Table 4 displays the item factor loading of the study model which it shows a good internal construct validity, which the values are greather between 0.64 to 0.93.

All the correlation among the strategies are statistically significant at alpha level of .05 (2-tailed) which it shows the strategies are correlating to each other. Compensation strategy has the lowest correlations to other five strategies: Memory strategy (0.408), Cognition strategy (0.533), Metacognition strategy (0.486), Affection strategy (0.475), and Social strategy (0.492). All other five strategies show statistically significantly correlating to each other at Pearson R above .6. Memory strategy is comparatively not strongly correlating to compensation strategy (0.408), affection strategy (0.658), and social strategy (0.677).

Table 6 displays the coefficient values of the relationship strength among the strategies. Compensation strategy has the weakest link, with the values between .533 to .408, to all other five strategies.

3.2 **Descriptive statistics of the study**

Results from the SILL of the study indicated that the study students used strategies at a medium level, which it was suggested by Oxford (1990).The mean of total strategy used was 3.0, indicating a medium strategy use overall (Nisbet et al., 2005;Oxford, 1990). The mean scores for three learning strategies (metacognition, memory, socialization, and memory) fell in the range of 2.89 to 2.96 which is suggested by Oxford as a medium strategy use. Two learning strategies (affection and compensation) fell into a mean between 3.06 and 3.30 suggested as a slightly-above medium strategy use (Arroyo, 2005; Oxford, 1990). Among these six L2 learning strategies, metacognitive strategy (M = 2.891, SD = 0.030) was least used among the study group whereas compensation strategy (M = 3.3, SD = 0.026) was reported to be most used by the study students.

Among all the study students, there was only 20 percent of the students showed their disinterest in learning English which they were 112 students from the study pool of 577

students. Most study students (564 students/ 98 %) said learning English is important to them as there were only 10 students (2 %) from the study group thinks English is not important to them. The study group included 327 (59%) female students and 228 (41%) male students, which it showed a fairly balanced body of the study group. Gender is not found to be statistically significant to all six learning strategies at this study.

4. DISCUSSION AND CONCLUSION

Students, parents, teachers, and adminstors in China are all reaching a consensus of studying English is important to individual, parents, and sociality. Indeed, English proficiency serves a critical index to individuals for academic study and career. SILL inventory is not much commonly used to study Chinese college students, which is only a study done by three American researchers,Nisbet and the associates (2005).This study shared the similar result toArroyo's research which the study students overall showed a medium strategy use, as the vaules fell into 2.9 and 3.3 (see Table 7) (Nisbet et al., 2005; Oxford, 1990).The selection of the study groups may be the factor to impacting on the variance of language learning strategies. Overall, the study students use direct learning strategies (memory, cognition, and compensation strategies) more often than indirector strategies (metacognition, affection, and socialization). As Oxford (1990) suggested that cultural differences may cause students' learning styles. The result from the study group might strongly suggest that cultural differences have played greatly infulential on learning environment, language-learning facilities, and English curricula in China.

Gender on this study seems not be statistically significant to those learning strategies, which both genders were sharing the similar characters of L2 language learning. Among the study students, compensation (R = 0.640) strategy was the weakiest predictors to SILL of the study group among other strategies: memory (R = 0.846), cognition (R = 0.930), metacognition (R = 0.957), affection (R = 0.930), and socialization (R = 0.906). Upon these results, cultural issues may be taken into the consideration to discuss the difference of Chinese students at varied school levels (Nisbet et al., 2005; Campbell and Zhao, 1993).

Correlations among the six langage learning strategies are found between 0.658 to 0.867, except the comensation strategy is found as low as 0.408 to 0.533. It suggested the study students least applied the compensation strategy in langauge learning when other strategies were practiced. Compared to Arroyo's study, this study suggested more varied strategies have been introduced to the students through their faculty. The English curricum has been more varied organized and planned to help their students develop language learning strategies. The changes in China have been dramatically upstretched these years. English education has been remained high foucs among other school subjects. With a good

number of budgets to schools, various quick changes in English curriculum at all school levels have been seen with promotion of Chinese education policy and more English faculty with relevant degrees from English-speaking countries.

5. LIMITATION OF THE STUDY & FUTURE SUGGESTIONS

(1) English proficiency test should be given at the same time as the SILL inventory given to see how the students strategy use could be used to investigating the relationships of learning strategies and students' proficiency.

(2) SILL has not been yet well introduced to English teachers and adminstrators in China; hence, there was only one study done in 2005 by Arroyo and his affilitates. Lack of familarity with SILL inventory led misunderstanding of the project at the workshop to the involved faculty at the time.

(3) Common European Framework of Reference (CEFR) was being introduced to the participating faculty at the time, comparing to the standardalized English-proficiency tests (CET-6/ CET-8)at unviersity level in China.The English proficiency creditential is not yet developed to equalent to the CEFR index. In short, language tests in China should be future developed to connect to the common language standards as it will be easier to measure students' language proficiency through various English-placement instruments.

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Table 1. Classification and examples of learner strategies (Abhakorn, 2008, p.193; Cohen, 2003).

By Skill	By Goal	By Function	Example
Listening	Language learning strategies: conscious processes learners select in order to learn language	Memory strategy	Using keywords
Reading		Cognitive strategy	Taking notes, summarizing
Writing	Language learning strategies: conscious processes learners select in order to use language	Metacognitive strategy	Organizing, self-monitoring, self-evaluation
Speaking		Compensation strategy	Coining words
		Affective strategy	Relaxing
		Social strategy	Asking for correction

Table 2. Correlations among learning strategies.

	Memory	Cognition	Compensation	Metacognition	Affection	Socialization
Memory	1					
Cognition	0.809	1				
Compensation	0.576	0.577	1			
Metacognition	0.842	0.844	0.601	1		
Affection	0.789	0.791	0.563	0.823	1	
Socialization	0.806	0.807	0.575	0.841	0.788	1

Table 3. Comparsions of two models.

Model	Goodness of model fit	Model 1 (1-construct)	Model 2 (6-construct)
χ^2	smaller value	1787.654	1633.761
χ^2/df	1~3	3.392	3.1
P-value	>0.05	0	0
IFI	>0.9	0.780	0.807
TLI	>0.9	0.748	0.779
CFI	>0.9	0.777	0.804
RMSEA	<. 08	0.064	0.060

Table 4. Regression among six L2 learning strategies of Model 2.

Strategy			Unstd. estimate	Std. estimate	Std. error	t-value	P
Memory	<---	DUsill	1	0.846			
Cognition	<---	DUsill	1.196	0.930	0.106	11.289	***
Compensation	<---	DUsill	0.717	0.640	0.091	7.866	***
Metacognition	<---	DUsill	1.460	0.957	0.118	12.424	***
Affection	<---	DUsill	1.259	0.930	0.109	11.536	***
Socialization	<---	DUsill	1.332	0.906	0.113	11.776	***

Table 5. Item Factor Loading of the Model 2.

	DU sill	Memory	Cognition	Compensation	Metacognition	Affection	Socialization
Q1	0.015	**0.072**	0.013	0.006	0.016	0.015	0.013
Q2	0.016	**0.076**	0.014	0.006	0.017	0.016	0.013
Q3	0.009	**0.044**	0.008	0.004	0.010	0.009	0.008
Q4	0.009	**0.040**	0.007	0.003	0.009	0.009	0.007
Q5	0.017	**0.081**	0.015	0.007	0.018	0.017	0.014
Q6	0.016	**0.076**	0.014	0.006	0.017	0.016	0.013
Q7	0.022	0.014	**0.060**	0.008	0.023	0.021	0.018
Q8	0.028	0.019	**0.078**	0.011	0.030	0.028	0.023
Q9	0.020	0.013	**0.055**	0.008	0.021	0.019	0.016
Q10	0.032	0.021	**0.088**	0.012	0.033	0.032	0.026
Q11	0.016	0.011	**0.044**	0.006	0.017	0.016	0.013
Q12	0.015	0.010	**0.040**	0.006	0.015	0.014	0.012
Q13	0.005	0.003	0.004	**0.050**	0.005	0.005	0.004
Q14	0.015	0.01	0.012	**0.158**	0.015	0.014	0.012
Q15	0.007	0.004	0.006	**0.071**	0.007	0.006	0.005
Q16	0.008	0.005	0.006	**0.082**	0.008	0.007	0.006
Q17	0.007	0.005	0.006	**0.082**	0.008	0.007	0.006
Q18	0.025	0.016	0.021	0.010	**0.059**	0.024	0.020
Q19	0.042	0.028	0.036	0.016	**0.102**	0.042	0.035
Q20	0.033	0.022	0.029	0.013	**0.081**	0.033	0.028
Q21	0.036	0.024	0.031	0.014	**0.087**	0.036	0.030
Q22	0.030	0.020	0.026	0.012	**0.072**	0.030	0.025
Q23	0.029	0.019	0.024	0.011	**0.069**	0.028	0.024
Q24	0.022	0.015	0.019	0.009	0.023	**0.067**	0.019
Q25	0.028	0.019	0.024	0.011	0.029	**0.084**	0.023
Q26	0.018	0.012	0.016	0.007	0.019	**0.055**	0.015
Q27	0.015	0.010	0.013	0.006	0.016	**0.046**	0.013
Q28	0.021	0.014	0.018	0.008	0.022	**0.064**	0.018
Q29	0.018	0.012	0.015	0.007	0.019	0.018	**0.068**
Q30	0.011	0.008	0.010	0.004	0.012	0.011	**0.043**
Q31	0.016	0.011	0.014	0.006	0.017	0.016	**0.062**
Q32	0.032	0.021	0.027	0.012	0.033	0.031	**0.120**
Q33	0.018	0.012	0.015	0.007	0.019	0.018	**0.067**
Q34	0.019	0.013	0.016	0.007	0.02	0.019	**0.072**

Table 6. Matrix of Coefficient values among the learning strategies of the study.

	MEM	COGN	COMPEN	METACOGN	AFFECT	SOCIAL
MEM	1					
COGN	.861**	1				
COMPEN	.408**	.533**	1			
METACOGN	.809**	.867**	.486**	1		
AFFECT	.658**	.724**	.475**	.815**	1	
SOCIAL	.677**	.790**	.492**	.833**	.765**	1

**p<.01

Table 7. Descriptive statistics of the SILL learning strategies.

Learning strategy	Rank	N.	Min.	Max.	Mean	Std. Dev.
Memory (6 items)	5	564	1	5	2.926	0.025
Cognition (6 items)	3	568	1	5	2.961	0.027
Compensation (5 items)	1	570	1	5	3.304	0.026
Metacognition (6 items)	6	568	1	4.83	2.891	0.030
Affection (5 items)	2	572	1	5	3.063	0.028
Socialization (6 items)	4	574	1	5	2.952	0.031
Total SILL (34 items)		532	34	160	3.009	0.778

Figure legend

Figure 1.

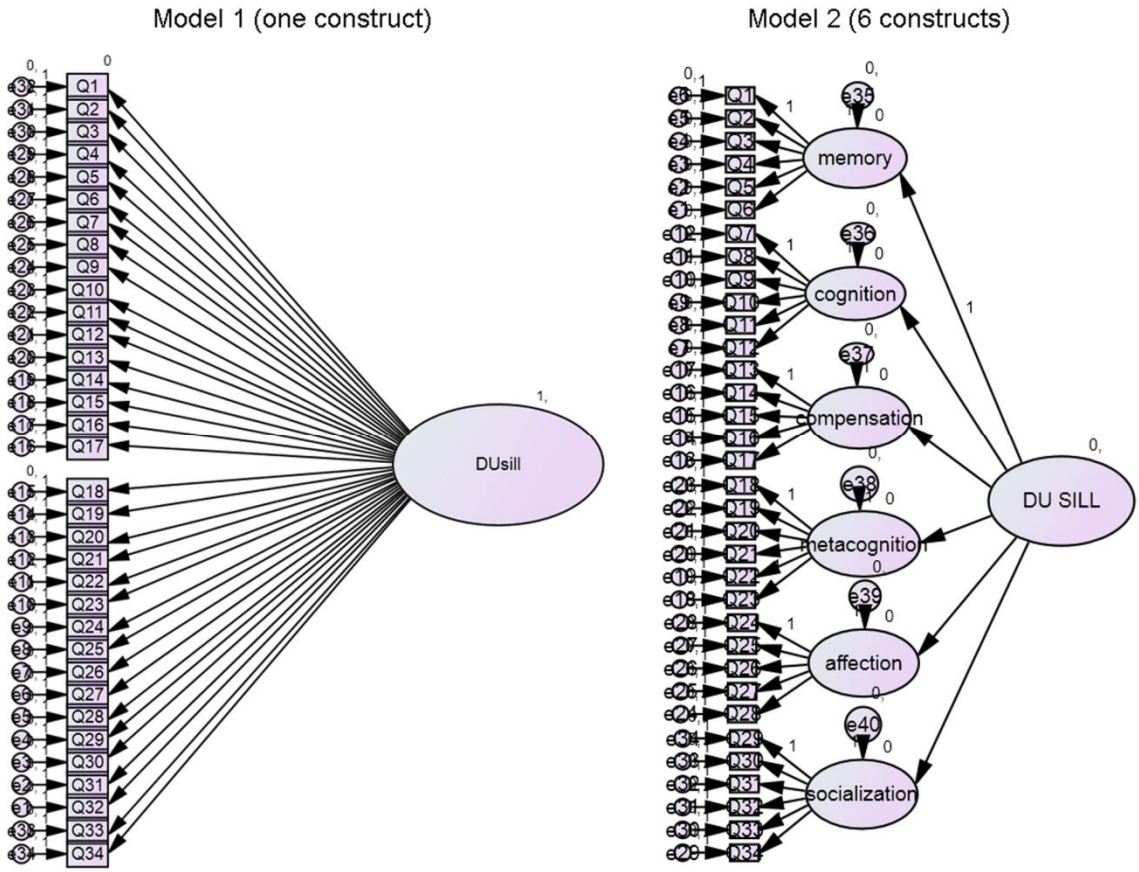

Figure 1.