The Correlation between Metacognitive Strategies and Foreign Language Attrition of Non-English Majors

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Abstract. This study examines the use of metacognitive learning strategies by non-English majors and their correlation to language attrition. By means of the language proficiency test, questionnaire survey and interviews of 116 non-English majors from Henan Polytechnic University, it was found that the participants did not often use metacognitive learning strategies, and most metacognitive learning strategies did not correlate with the amount of language attrition of participants, but the metacognitive strategies were weakly correlated with the CET-4 scores of the participants at the level of 0.01. The most frequently used is the selective attention strategies, and the lowest frequency of use is self-monitoring and planning strategies. The study also found that the proficiency level prior to attrition had a certain predictive effect on language attrition.

Introduction

Language attrition is the inverse process of language learning. It refers to the phenomenon that the ability of bilingual or multilingual users will gradually decrease due to the reduction or cessation of the use of a certain language. [1] Since the "Language Skills Loss Conference" was held at the University of Pennsylvania in 1980, language attrition research has become a relatively independent field of language research and a large number of experts have begun their research in this field (de Bot, 2001; Tomiyama, 2000; Fliessbach et al., 2006; Schmid, 2011, 2013，2017, 2018; Zhong Shueneng, 2003; Cai Hansong, 2004; Ni Chuanbin, 2006, 2010, 2011; Wang Xiangyun, 2011; etc.). They have conducted fruitful studies on language attrition from different levels and from different angles and constructed many relatively complete theoretical frameworks. Some studies abroad have compared the degree of attrition of speech, grammar and vocabulary with different research methods and participants, and found that the vocabulary attrites the most obviously and the earliest, followed by the grammar, and the speech has the lowest degree of attrition and language attrition is a complex, non-linear development. [2][3] Therefore, vocabulary attrition is the focus of foreign language attrition research and has become the foundation of other parts of language attrition research. [4] However, there have been few empirical studies on language attrition in China.

The learning strategy is an important factor affecting the process of second language acquisition. As a reverse process of second language acquisition, language attrition is inevitably influenced by learning strategies, particularly by the metacognitive strategy, which is a strategy for learners to effectively monitor and control their entire learning process and plays a very important role in improving the learners' academic performance and cultivating their independent learning. [5] Metacognition plays a very important role in the guidance and coordination of foreign language learning. It can reveal to some extent the underlying reasons for the foreign language learning achievements (big or small). [5]

In the past 30 years, there have been an increasing number of scholars conducting researches on metacognitive strategies at home and abroad (O'Malley & Chamot, 1990; Oxford, 1990; Wenden, 1991; Wen Qiufang & Wang Haixiao,1996; Yang Xiaohu & Zhang Wenpeng, 2002; Li Jun & Ni Hangying, 2017; and etc). Although their findings are not the same, these scholars basically believe that there is a difference between the uses of metacognitive strategies among learners and that students with strong metacognitive ability have better scores in language learning than those with

weak metacognitive ability. However, as of now, language learning strategies have not been explored as factors affecting language attrition, and few scholars have studied the effects of metacognitive strategies on language attrition.

Based on the studies of language learning strategies and language attrition, the following three questions are to be investigated in this study: (1) metacognitive strategies employed by English learners (2) the correlation between metacognitive strategies and foreign language proficiency (3) the correlation between metacognitive strategies and foreign language attrition.

Research Design

Participants.
The participants are 168 students from different majors from Henan Polytechnic University. They ended their college English class learning at the end of June 2017, and the attrition time span was one year (including winter and summer vacations). After comprehensively processing the data, 116 valid participants were obtained and then we randomly selected 10 participants to interview them to find out their use of the metacognitive learning strategies in English learning.

Instruments
There are three survey instruments: the English learning metacognitive strategy questionnaire, interviews and CET-4 papers. The questionnaire includes three parts. The first part is personal background information and their CET-4 score (Test 1). The second part is the participants' English metacognitive strategy use survey. The third part is the work scale of English learning meta-cognitive strategy survey.

The interview consists of ten items, containing the five strategy categories in the questionnaire and each category consists of two items. The CET-4 paper is a test paper for June 2012 which is highly reliable and valid

Data Collection and Analysis
In late June 2018, one year after finishing the college English class learning, we adopted the CET-4 test paper of June 2012 to test the language level of the participants, and all the papers were collected. The results were used as the attrited results (Test 2). Then we conducted a questionnaire on English learning metacognitive strategies for the same participants and all the questionnaires were collected. For the three sets of data collected twice, we used SPSS 20.0 for statistical analysis to answer the three questions raised in the first part.

The Results and Analysis

Statistics on the Use of Metacognitive Learning Strategies.

Table 1   Statistics on the Use of Metacognitive Strategies

	N	Minimum	Maximum	Mean	Rank	Std. Deviation
	N	Minimum	Maximum	Mean	Rank	Std. Deviation
Planning	116	1.71	4.71	2.8633	4	.58626
Self-management	116	1.57	4.29	2.9273	3	.63762
Selective Attention	116	1.86	4.71	3.0788	1	.61635
Self-monitoring	116	1.43	4.57	2.8227	5	.63599
Self-evaluation	116	1.86	4.57	2.9926	2	.66176
Mean	116	1.97	4.49	2.9370		.50429

Table 1 shows that the mean of the five kinds of metacognitive strategies is all around 3, the mean of all is only 2.9370, and the frequency of use is "medium", indicating that the participants do not often but sometimes use these metacognitive strategies. Though metacognitive strategies are extremely important, research shows that learners use these strategies sporadically and without much sense of their importance. [6] Zhang Wei's study (2005:59) also shows that students do not often use metacognitive strategies. However, the "self-evaluation strategy" (M=3.47) was the most widely used strategy for participants. [7] In our study, the "Selective Attention" (M=3.0788) is the

most frequently used. Even the item 20 (I will stop and reread the text several times in the confusing place), the most frequently used, has the mean of only 3.2845. The lowest frequency of use is self-monitoring (M=2.8227), and the mean of the five strategies is very low (M=2.9370), indicating the students are not willing to use the brain. It is not difficult to explain why the two CET–4 average scores of the participants are low, only near the pass line.

In the subsequent interviews, most of the participants said that they were not clear about the concept of metacognitive strategies. They lacked the use of strategies in learning or could not use them flexibly and effectively. They lacked purposes and planning in their learning and could not distinguish between the important and difficult points. They could not actively manage, monitor and adjust their learning processes and the use of strategies. They lacked objective evaluation of their learning outcomes and use of strategies and could not take remedial measures.

The Correlation between Metacognitive Strategies and Achievements.

The use of metacognitive strategies has a very significant correlation with the English level of students and their English scores can be predicted to some extent through their use of metacognitive strategies. [9] Zhang Wei's (2005) study also showed that self-management, attention planning, and

Table 2　The Correlation between Metacognitive Strategies and Achievements

		planning	Self-mana gement	Selective attention	Self-mo nitoring	Self-eval uation	Mean	Test1	Test 2
planning	P Correlation	1	.552**	.547**	.399**	.536**	.747**	.256**	.366**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.006	.000
	N	116	116	116	116	116	116	116	116
Self-management	P Correlation	.552**	1	.652**	.542**	.588**	.831**	.244**	.294**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.008	.001
	N	116	116	116	116	116	116	116	116
Selective attention	P Correlation	.547**	.652**	1	.500**	.563**	.810**	.252**	.301**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.006	.001
	N	116	116	116	116	116	116	116	116
Self-monitoring	P Correlation	.399**	.542**	.500**	1	.672**	.781**	.236*	.326**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.011	.000
Self-evaluation	N	116	116	116	116	116	116	116	116
	P Correlation	.536**	.588**	.563**	.672**	1	.843**	.251**	.343**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.007	.000
	N	116	116	116	116	116	116	116	116
Mean	P Correlation	.747**	.831**	.810**	.781**	.843**	1	.308**	.405**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.001	.000
	N	116	116	116	116	116	116	116	116
Test1	P Correlation	.256**	.244**	.252**	.236*	.251**	.308**	1	.928**
	Sig. (2-tailed)	.006	.008	.006	.011	.007	.001		.000
	N	116	116	116	116	116	116	116	116

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Test1 is the self-reported CET-4 scores of the participants, and Test 2 is the CET-4 test scores after one year of the participants ' language attrition.

goal and plan were significantly correlated to academic achievements, but our findings are not consistent with this view. As can be seen from Table 2, the metacognitive strategy is weakly correlated with the CET-4 Test 1 and Test 2 scores at the level of 0.01 (P=0.308 and P=0.405). The five categories of metacognitive strategies are also weakly correlated with Test 1 and Test 2 scores at the level of 0.01 or 0.05. The subsequent interviews confirmed this finding. This shows that the metacognitive strategy is only one of the factors influencing academic achievements, or it only acts in an indirect way on academic achievements. Perhaps there are also many other factors that influence academic achievements. The relationship between the frequency of the use of the strategies and the learners' achievements is not linear, but rather complicated. The relationship between the frequency of the use of the strategies and the learners' achievements is not linear, but rather complicated", "there is a low correlation between strategy and achievement, and the strategy

has a low explanatory power for the achievement. [8]

We conducted in-depth interviews with the chosen participants to further find out the reasons for the low correlation between metacognitive strategies and low scores and found:(1)the participants had to participate a large number of club activities and social practice activities, so they rarely previewed the lessons; (2) very few participants had specific learning plans, even if some had tried to make plans but given them up after finding it difficult to implement; (3) most of the participants were clear about their learning weaknesses, but they had no effective strategies on how to improve it; (4) The participants were not flexible to use the learning strategies, even if they found some effective; (5) the participants could not monitor their own learning process and reflected on their own learning effects. Based on the findings above, we believe that the training of metacognitive strategies is especially necessary, because "training can greatly improve the learners' use of metacognitive strategies and their academic achievements", [1], making students become autonomous learners.

The Language Attrition of the Participants.

Table 3　Differences of two CET-4 scores

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Test1--- Test2	18.621	18.842	1.749	15.155	22.086	10.644	115	.000

Table 3 shows that the mean difference between the self-reported scores (test 1) and the test scores (test 2) of the participants is 18.621, the standard deviation of the differences is 18.842, and the 95% confidence interval of the difference is the lower limit. There is no zero between the upper limit and the upper limit, indicating a significant difference between the two CET-4 scores. The *t* value is 10.644, the *df* is 116-1 = 115, and the significance of the two-tailed t-test is 0.000, much less than 0.05, which also indicates a significant difference between the two results. This shows that after one year of finishing the formal English class learning, although they studied English in various ways for various purposes (for Postgraduate Admission Test　or CET-6, etc.), their English scores did decline and attrition did appear. Among the 116 participants, 89 participants' scores attrited, accounting for 76.72% of the total.

The Correlation between Metacognitive Strategies and Language Attrition

Table 4　The Correlation between Metacognitive Strategies and Language Attrition

		T2-T1	mean	planning	Self-management	Selective attention	Self-monitoring	Self-evaluation
T2-T1	P. Correlation	1	.113	.098	.058	-.071	.100	.248*
	Sig. (2-tailed)		.293	.363	.591	.509	.351	.019
	N	89	89	8　89	89	89	89	89
mean	P. Correlation	.113	1	.733**	.842**	.796**	.761**	.839**
	Sig. (2-tailed)	.293		.000	.000	.000	.000	.000
	N	89	89	89	89	89	89	89
planning	P. Correlation	.098	.733**	1	.573**	.533**	.370**	.530**
	Sig. (2-tailed)	.363	.000		.000	.000	.000	.000
	N	89	89	89	89	89	89	89
Self-management	P. Correlation	.058	.842**	.573**	1	.670**	.533**	.573**
	Sig. (2-tailed)	.591	.000	.000		.000	.000	.000
	N	89	89	89	89	89	89	89
Selective attention	P. Correlation	-.071	.796**	.533**	.670**	1	.433**	.538**
	Sig. (2-tailed)	.509	.000	.000	.000		.000	.000
	N	89	89	89	89	89	89	89
Self-monitoring	P. Correlation	.100	.761**	.370**	.533**	.433**	1	.642**
	Sig. (2-tailed)	.351	.000	.000	.000	.000		.000
	N	89	89	89	89	89	89	89
Self-evaluation	P. Correlation	.248*	.839**	.530**	.573**	.538**	.642**	1
	Sig. (2-tailed)	.019	.000	.000	.000	.000	.000	
	N	89	89	89	89	89	89	89

Table 4 shows that all the metacognitive strategies, including the whole questionnaire and its subsets, except for the self-evaluation strategy (p=.019 < 0.05), which is weakly correlated with the language attrition of the participants (r=0.248), are not correlated with the amount of language attrition of the participants, which is inconsistent with the findings of Wang Haijun (2009), who concludes that metacognitive strategies are particularly significantly correlated with the degree of language attrition. We know through subsequent interviews, that most of the participants were still self-studying English for various reasons, even though the participants did not have English classroom teaching during the third year. However, their English learning at this time was only for the exams, and they were busy doing a large number test papers all the day. They would not "waste time" thinking about methodological problems. Their progress and regression in English learning in this period are related to time and the amount of test papers, and have nothing to do with methods. Therefore, we conclude that the metacognitive strategies of the participants in this survey are not correlated to their language attrition (p=0.293>0.05).

Summary

In this study we find that the participants do not often use the five major metacognitive learning strategies. The most frequently used is the selective attention strategies and the lowest frequency of use is self-monitoring and planning strategies. We also find that metacognitive strategies are weakly correlated with the CET-4 scores of the participants. There are significant differences in the frequency of metacognitive strategies used by participants.

In this study 76.72% of the participants' achievements show attrition; and except that there is weak correlation between the self-evaluation strategy and the language attrition of the participants, the other metacognitive strategies are not correlated with the amount of language attrition of the participants.

Because the sample of this study is relatively small and comes from some majors in the same university, the research findings may have certain limitations, and further researches are needed. The proficiency level prior to attrition is a key factor in language attrition, and a large number of studies have shown that learning strategies can improve students' the proficiency level prior to attrition. Therefore, learning strategy training should be an important means of reducing language attrition.

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