

# An Empirical Study on the Relation between Meta-cognitive Strategies and Listening Autonomous Learning Ability

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**Abstract**—Meta-cognition refers to learners' autonomous awareness of their own mental process and the ability to reflect, control, evaluate and regulate their own cognitive process. Influenced by traditional teaching mode, college students are always lack of the ability of autonomic learning and of learning methods. We should foster their consciousness of meta-cognition using meta-cognition strategy, help them make a planning and improve self-supervision ability and self-evaluation ability. A great number of studies show that meta-cognition strategies provides the learners the proper guidance in English listening and can be acquired by training. Thus, we think that meta-cognition is the most crucial to further improve learners' listening autonomous learning ability. Based on the essence of meta-cognition theory and the characteristics of college English teaching, the cultivation of students' meta-cognition is favorable for the improvement of their ability to learn English listening autonomously. In students' listening autonomous learning, we should strengthen the training of meta-cognition. This paper analyzes and discusses the relationship between meta-cognitive strategies and English listening autonomous learning ability referring to the statistics and results from the empirical study of meta-cognition strategies training on 60 non-English major students. Results also showed that meta-cognition strategies training contributed to autonomous listening behaviors. Recommendations for further research are discussed.

**Index Terms**—meta-cognition strategies, strategies training, listening autonomous learning ability

## I. INTRODUCTION

Meta-cognitive theory caught the widespread concern in education fields, after it was introduced into China since the 1980s. In recent years, this theory has been widely applied to the pedagogical field. Meta-cognitive strategies concern the individual conscious control of cognitive activities and are helpful to improve autonomous learning ability. With the development of college English curriculum reform, the cultivation of listening autonomous learning ability and teaching research attract much attention. Reviewing foreign and domestic studies on meta-cognitive strategies, this paper analyzes teaching and learning psychological motivation from the perspective of meta-cognitive strategies, with the emphasis on the cognitive structure and cognitive process of students as well as the cultivation of students' listening autonomous learning ability, stimulating students' potential, and strengthening the cultivation of their listening autonomous learning ability, thereby optimizing the teaching structure which put forward education suggestions based on the experiment results. The results indicates that the training of meta-cognition strategies can not only help to improve students English listening, but also inspire student's motive and improve their ability to learn independently. On the basis of previous researches, it further explores the relation between meta-cognition strategies training and listening autonomous learning ability. It also helps to enrich the teachers' education research and to provide empirical research for foreign language teaching theory in listening autonomous learning cultivation.

## II. AN OVERVIEW OF META-COGNITION THEORY AND AUTONOMOUS LEARNING THEORY

### A. Meta-cognition Theory

Meta-cognition means an individual's awareness of his own thinking processes and his ability to control these processes. Meta-cognition is a model of cognition, which acts at a meta-level, and is related to the object-world, through the monitoring and control function (Efklides 2001). It is observed that modern studies discuss the meta-cognition under three main facets: meta-cognitive knowledge, meta-cognitive control (Desoete and Roeyers 2006; Flavell 1979; Nelson and Narens 1990; Otani and Widner 2005; Ozsoy et al. 2010; Sungur 2007) and meta-cognitive experiences (Efklides 2001, 2008; Flavell 1979). "Meta-cognitive knowledge is knowledge we retrieve from memory and regards what the person knows or believes about him/herself and the others as cognitive beings, their relations with various cognitive tasks, goals, actions or strategies as well as the experiences s/he has had in relation to them" (Efklides 2001, p. 299). Meta-cognitive knowledge can be described as the knowledge, awareness, and deeper understanding of one's own cognitive processes and products (Flavell and Wellman 1977). Paris et al. (1984) suggested that meta-cognitive

knowledge can be divided into three areas. These areas are declarative, procedural, and conditional knowledge. Declarative knowledge refers to knowledge about one's general processing abilities. The knowledge about how to successfully solve problems is called procedural knowledge. Conditional knowledge means knowledge about when to employ specific strategies (Sperling et al. 2004).

Empirical studies (e.g. Baird, 1986; Paris & Oka, 1986; Thomas & McRobbie, 2001) have consistently suggested that enhancing students' meta-cognition can result in improvements in learning. Further, Veenman, Wilhelm and Beishuizan (2003) have suggested that independent of intelligence, "meta-cognitive skills appear to develop and to contribute to learning performance" (p. 89).

### *B. Meta-cognition Strategy*

Meta-cognitive strategies may be thought of as core learning strategies because they are applicable to a variety of learning tasks and also because they are overarching strategies above cognitive strategies and social/affective strategies. Meta-cognitive strategies are higher order executive skills entailing goal identification, planning, monitoring and evaluation. According to Anderson (2002), understanding and controlling cognitive processes may be one of the most essential skills in the classroom. It seems that meta-cognitive strategies, which allow students to plan, control, and evaluate their learning, have the most central role to play in this respect, rather than those that merely maximize interaction and input. Thus the ability to choose and evaluate one's strategies is of central importance. There are also other researchers who emphasize meta-cognition in learning strategies. Williams and Burden (2000) stress meta-cognition is central to effective learning. Wenden (1987) says that meta-cognition is "the process that underlies the efficient use of strategies and the essence of intelligent activity" (p. 573). Quicke (1994) similarly views that meta-cognitive awareness is crucial in learning strategies. Ellis (1994) is relatively reserved, saying that meta-cognitive strategies assume considerable importance at least for adults. In addition, most of the studies (O'Malley and Chamot 1990; Wenden and Rubin 1987; Oxford and Crookall 1989) found the learners who were particularly taught meta-cognitive strategies performed better. Good language learners make use of meta-cognitive knowledge to help them assess the needs, evaluate progress and give directions to their learning.

This paper explored the impact of meta-cognition strategies training on students' listening autonomous learning ability, and stresses the importance of meta-cognitive strategies in strategy instruction. The experimental group achieved significantly better results than the contrast group after one semester of meta-cognition strategy-based training. Results also showed that the strategy instruction contributed to students' listening autonomous learning ability.

### *C. Autonomous Learning Theory*

The concept autonomous learning was put forward by Holec in 1981. It is considered as the beginning of autonomous learning study. Since then, Allwright (1990), Huttunen (1986), Cotterall (1995), Benson (1997), Bandura (1997, 1986), Zimmerman (1990, 1996), Dickinson (2004) have done a great deal of research work on it and their masterpieces about autonomous learning came out gradually. In the late of the 1990s, this research reached its summit. Although Holec defined autonomous learning as "the ability to be responsible for own learning" (1981), no united definition was formed. Some researchers consider it a kind of ability while some others think it as a kind of behaviors. Huttunen (1986) thinks that autonomous learning is a certain study behaviors and learners' individual or collective monitor or evaluation of learning process. Allwright (1990) says that the autonomy of learning is a continued transformation but sometimes it is a balanced state between maximum self-development and interdependence. Cotterall (1995) believes that the learning autonomy is a degree of a learner's regulating and controlling on his study with some strategy. Benson (1997) defines autonomous learning "the ability of controlling personal learning". He believes that the "autonomy" is a different ability for different individual and the same person will present various "autonomy" in different occasions.

Nowadays, many theories have been raised to discuss autonomous learning. Based on those theories, empirical study is designed in this paper which aims at analyzing what effects the meta-cognition strategies training can bring to listening autonomous learning ability. Although autonomous learning theories are emphasized in many schools, some teachers still do not know how to put them into practice in English teaching. And they still cannot change their role in their teaching. They just do it in the traditional way. They teach the students knowledge as much as they could, and the students just accept as much as possible. Suggestions are given here to help English teachers be aware of their real roles in students' autonomous learning and improve their autonomous learning ability through appropriate meta-cognition strategy training.

Self-access learning centre is a new learning environment in the context of nationwide college English teaching reform. In this study, meta-cognition strategy training was performed on English listening in the self-learning center. The results indicate that the training of listening meta-cognition strategies can not only help to improve students' English listening, but also inspire student's motive and improve their ability to learn independently.

## III. THE PROCESS AND RESULTS OF THE EMPIRICAL STUDY

Since the importance of meta-cognition has been stressed, it is advisable to heighten learners' meta-cognitive awareness. Wen (1995) emphasized that successful learners are thoughtful and aware of themselves in relation to the learning process. They are able to employ strategies unconsciously, and make their meta-cognitive awareness into play

when necessary or when they are faced with difficulties. Such awareness gives learners control over their own learning. Therefore, meta-cognitive awareness is a necessary and essential focus in learning to regulate learning.

Training in meta-cognitive awareness includes awareness of what learning a language involves as well as training in the selection of appropriate strategies for different situations. In addition, meta-cognitive training should include heightening awareness of the feelings in different aspects of language learning, and of a learner's personalities and strengths. (Williams & Burden, 2000) To raise meta-cognitive awareness involves five aspects.: (1) preparing and planning for learning; (2) knowing how to select and use learning strategies; (3) monitoring strategy use; (4) knowing how to deploy various strategies; (5) self-assessing one's own strategy use. The five aspects are valuable suggestions for teachers to instruct the meta-cognitive strategies. To have good meta-cognitive awareness can greatly facilitate the improvement of strategy use and empower second language learners.

When it comes to training learners in the use of learning strategies in second language learning, maybe it is most appropriate to say "there is a lot to play for" (Skehan 1991 as cited in Ellis, 1994, p.558). Up to now, there are a large number of materials on training learners to use effective language learning strategies (e.g., Ellis and Sinclair 1989; Brown 1989; Oxford 1990; Wenden 1986b and 1991). However, there have been few empirical studies evaluating the impact of meta-cognition strategies training on students' listening autonomous learning ability and the relationship between them. Meta-cognition strategy training in second language listening is effective in enhancing listening comprehension. The following empirical study aim at exploring the impact of meta-cognition strategies training on students' listening autonomous learning ability.

#### A. *Participants and Methods*

##### **Participants**

The participants of the study consist of 60 second grade students of non-English major students in Qingdao University of Science and Technology. They have completed two semesters of college English learning. They did not received any formal training of learning strategies, they all have to improve their English listening and all have strong desires to pass the CET4. They are respectively divided into experimental group and contrast group. Every group includes 30 students.

##### **Methods: meta-cognition strategies training**

This research instruments mainly include English CET4 listening test before meta-cognition strategies training, final CET4 listening test after training and English Listening Strategies Questionnaire. Questions of CET4 listening test are eight short dialogues, two long dialogues, three passages and a compound listening. Listening meta-cognition strategy questionnaire will be distributed after meta-cognition strategies training to reflect their listening problems and evaluate their autonomous learning ability (4 stands for "strongly agree", 3 for "agree", 2 for "disagree" and 1 for "strongly disagree").

Those two groups of students first had the English CET4 listening test before meta-cognition strategies training to learn their listening proficiency level. Then the meta-cognition strategies training were taught to the experimental group students for one semester. The contrast group did not receive any meta-cognition strategies training. Meta-cognitive strategies such as "determining in advance what my reading purpose is and then reading the text with that goal in mind", "looking for specific aspects of information and focusing on that information while reading the text", "checking the effectiveness in strategy use", "checking whether the goals for reading are accomplished". Finally, both groups had the final CET4 listening test after training to reflect their listening performance.

The teacher, who was also the classroom teacher, asked the participants to join in the interactive discussion and definitions of strategies, and to use them in the listening class. The teacher-researcher gradually encouraged them to use strategies independently. This task was supposed to help the students to raise their awareness of using strategies. Strategy instruction normally begins by helping students become aware of what strategies are and which ones they are already using. The teacher presented and modeled strategies so that students became increasingly aware of their own thinking and learning strategies. Students started using these strategies independently so that learner autonomy (autonomy of language learning competence) or self-regulation could be regarded as an ultimate goal for the strategy instruction.

#### B. *Results and Analysis*

Listening meta-cognition strategy questionnaire was distributed among the participants after meta-cognition strategies training. The following is the results. (4 stands for "strongly agree", 3 for "agree", 2 for "disagree" and 1 for "strongly disagree").

Learning strategies	4	3	2	1
It's important to set goals for my learning.	60%	36%	4%	0%
It's important to make plans for my learning.	49%	47%	4%	0%
It's important to evaluate my progress.	13%	65%	22%	0%
I feel I know what the best strategy for my language learning is.	6%	40%	48%	2%

Among meta-cognitive strategies, making plan, setting goals and evaluating are the main means to achieve autonomy. After the strategy training, 96% of students have agreement responses to goal setting and plan making. It seems that students are willing to assume more responsibility and are initiative in taking charge of their own learning autonomously.

The CET4 listening tests were utilized as a pre-test and post-test assessment. The listening scores of participants in both groups were collected after tests in order to explore the possible impact of meta-cognition strategies instruction on their listening comprehension. Pre-test results and post-test results are available. The data of the survey results and student test scores results were statistically analyzed using statistical software SPSS. The questions and difficulty of CET4 listening proficiency pre-test and post-test are same. The listening test scores of two group results are shown in Table 1 and Table 2.

TABLE ONE  
PRE-TEST AND POST-TEST RESULTS ANALYSIS OF EXPERIMENTAL GROUP

	Short dialogues	Long dialogues	Passages	Compound dictation	Total average score
Pre-test	3.1	2.73	4.26	3.83	13.92
Post-test	3.56	3.1	4.9	4	15.56
Difference	0.46	0.37	0.64	0.17	1.64
t	1.787	2.262	3.176	3.053	4.182
P	0.042	0.015	0.001	0.002	0.0001

TABLE TWO  
PRE-TEST AND POST-TEST RESULTS ANALYSIS OF CONTRAST GROUP

	Short dialogues	Long dialogues	Passages	Compound dictation	Total average score
Pre-test	2.76	3.2	4.1	2.95	13.01
Post-test	3.16	3.5	3.8	2.93	13.39
Difference	0.4	0.3	-0.3	-0.02	0.38
t	1.561	1.201	-0.858	-0.046	0.605
P	0.064	0.119	0.199	0.481	0.274

Questions and total score of the test papers were short dialogue 8 points, long dialogue 7 points, essay 10 points and compound dictation 10 points.

From the table one, we can see the pre-test total average score of experimental students was 13.92 and the post-test total average score increased to 15.56 points. The difference was 1.64 and  $P=0.0001<0.05$  explained that the experimental students' listening test results had been significantly improved after one semester of listening meta-cognition strategies training. From the analysis of the data of Table 1, the scores of all various questions had been increased and the differences were respectively 0.46, 0.37, 0.64 and 0.17. The data suggests that meta-cognition strategies help to improve the results of all kinds of listening questions and in this study, the score of passages has been increased significantly. Statistics also showed that there was an overall increase in the experimental group's performance of listening test as seen in the post-test and there was a difference in the experimental group between the pre-test to post-test listening scores. The experimental group seems to have benefited from meta-cognition strategies instruction.

From the table two, we can see the pre-test total average score of contrast students was 13.01 and the post-test total average score increased to 13.39 points. The difference was only 0.38 and  $P=0.274>0.05$  explained that the contrast students' listening test results were almost same with the pre-test listening results. From the analysis of the data of Table 1, the scores of short dialogues and long dialogue had been slightly increased and the results of passages and compound dictation were even worse than the pre-test results. The differences were respectively 0.4, 0.3, -0.3 and -0.02. It indicated that the contrast group did not receive better listening results without meta-cognition strategies training.

Compare the results of experimental and contrast group, it can be concluded that the experimental group performed better than the contrast group in the post-test after one semester meta-cognition strategies, indicating a strong association between meta-cognition strategies training and listening performance improvement for the experimental group and listening autonomous learning ability. The data analysis also showed that the students' cognitive and meta-cognition strategies have been greatly improved after the meta-cognition strategies training.

#### IV. CONCLUSION AND SUGGESTIONS

##### Conclusion

There are many studies reports that teaching meta-cognitive skills to students may lead to some improvement in their academic achievement (Cardelle-Elawar 1992; Silver 1987; Ozsoy and Ataman 2009). Different approaches to improve meta-cognitive abilities, such as 'IMPROVE' (Mevarech and Fridkin 2006; Mevarech and Kramarski 1997), 'meta-cognitive problem solving activities' (Ozsoy and Ataman 2009), and 'reciprocal teaching' (Palincsar and Brown 1984) are available to teachers to provide their students with instruction in meta-cognitive strategies. On the other hand, during the review of literature for this study, it has been observed that meta-cognitive skills are studied usually in

relationship with the language and listening skills. Meta-cognitive skills can also be studied especially in relationship with courses such as social sciences, science, and arts.

The objective of the current study was to examine the relation between meta-cognitive strategies and listening autonomous learning ability. It was observed that the experimental group outperformed the contrast group in listening performance and there was a positive and high correlation between meta-cognition strategies and listening achievement and listening autonomous learning ability. For this reason, meta-cognition can be used as a useful tool in order to develop listening skills. The results also show that, under the guidance of the meta-cognitive theory, using the integrated and organized meta-cognition strategies design, it not only strengthens the students' listening autonomous learning ability, but also improves the overall learning outcomes.

(1) The meta-cognitive strategies help improve students' autonomous learning ability. To use meta-cognitive strategies in the process of developing foreign language autonomous learning ability, learn the main cognitive processes and how they process, maintain and use foreign language information, to guide students to use the necessary meta-cognitive strategies in order to improve the analysis, and creative use of language ability; To learn the main existing cognitive structure, find the best links between the old knowledge of learners' cognitive structures and new knowledge, make the new knowledge interact with students' cognitive structure, to gain an overall improved autonomous learning ability.

(2) Foreign Language Autonomy learning ability has an effect on the foreign language learning outcomes. The students good at using meta-cognitive strategies have planning and initiative ability, stronger autonomous learning ability and better learning outcomes; students not good using meta-cognitive strategies are usually in the blind and passive state, have poor autonomous learning ability and poor foreign language learning outcomes.

### Suggestions

Currently, the foreign language autonomous learning ability of our college students are generally low, and in this context, using meta-cognitive strategies and strengthening the foreign languages autonomous learning ability are particularly important to improve learning outcomes.

(1) To stimulate students' interest in learning and promote autonomous learning. In the process of developing students' autonomous learning, teachers should pay attention to stimulate students' interest, strive to improve their professional level according to curriculum implementation needs and characteristics of students' psychological development, and thus effectively promote the changes and optimization of learning methods.

(2) To develop students' self-monitoring abilities. Self-record is an effective means of self-monitoring. In teaching, teachers should require students to develop self-monitoring tables, making students conscious of their own learning process, learning mode, learning strategies and study effects in order to self-monitor themselves. Correctly using meta-cognitive strategies, class lectures and panel discussions help to develop students' self-monitoring capabilities.

(3) Meta-cognitive strategy training should be combined with guidance of teachers. A combination of meta-cognitive strategy training and guidance of teachers and evaluation of student learning objectives, content and methods in teaching play a crucial role in improving the students' autonomous learning ability.

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