

# The Relationship between Cognitive and Metacognitive Strategy Use and EFL Listening Test Performance

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**Abstract**—This study aimed to investigate the relationship between cognitive and metacognitive strategy use and Iranian EFL learners' listening test performance and whether advanced, upper-intermediate, intermediate Iranian EFL learners differed using these two strategies. More specifically, this study tried to examine Iranian EFL students' use of different cognitive and metacognitive test taking strategies and the most and the least frequent uses of these strategies by students while they are performing listening comprehension tests. The participants were 96 male and female Iranian EFL university students with the age ranging from 20 to 24 years old. The collected data included listening comprehension, achievement test scores, and responses to a Likert-scale cognitive and metacognitive questionnaire. Transcription of retrospective interviews was also used to clarify further the quantitative analyses. Results of the analyses indicated that Iranian EFL students participating in this study resorted more to metacognitive strategies than cognitive strategies. The use of the mentioned test taking strategies had a positive correlation with the listening test performance, and it seemed different across the proficiency level of the students in which the students at higher levels of listening ability used these strategies more often than less successful listeners did. The finding of the study also suggested that the use of cognitive and metacognitive strategies could account for variation in EFL listening achievement and need to be encouraged, trained, and promoted by EFL teachers.

**Index Terms**—cognitive strategies, metacognitive strategies, listening test

## I. INTRODUCTION

Advances made in foreign language teaching and testing, cognitive psychology and information processing systems have allowed studies to be conducted to categories test taking strategies utilized by EFL learners when they are performing different language tasks including reading, listening, writing and speaking. However, few studies in the EFL language testing literature have looked at the use of cognitive and metacognitive strategies and its relationship to proficiency level in listening comprehension tests. Thus, the current study tried to examine Iranian EFL test takers reported strategy use in a listening test and its relationship with their listening test performance.

Cohen and Upton (2007) define test-taking strategies as kinds of processes of which test takers are aware at least to some extent. In cognitive strategies, respondents use their language knowledge and world knowledge to do a task. Language knowledge mainly is divided into two types: organizational knowledge and pragmatic knowledge (Bachman, 1990). World knowledge is considered as general knowledge, which includes economy, business, politics, environment, and science that may concern the tasks. The information pertaining to metacognitive strategies are under the domain of all this knowledge. (Bachman and Pulmer, 1996). Examples of cognitive strategies are inferencing, making prediction, translating, summarizing, linking with prior knowledge or experience, memory strategies, retrieval strategies, and guessing meaning from context. (O'Malley and Chamot, 1990; Oxford, 1990). Oxford (2012) said that metacognitive strategies encompass new information to the old one, selecting, deliberate thinking strategies, planning, monitoring, and evaluating thinking process (As cited in Rahimi & Katal, 2012). Ridley et al. (1992) also mentioned that metacognitive strategies help learners handle and inspect learning activities such as conscious monitoring learning, planning and selecting strategies, rectifying errors, analyzing the effect of learning strategies and modifying learning behaviors and strategies when necessary. According to Bachman and Pulmer (1996), factors acting on language test scores should be taken in serious consideration because we should be capable of discussing and exploring differences in language test

performance and similarities between test performance and language use in cases other than tests. This enhances the importance of strategic competence in L2 use, learning or testing. Iranian EFL test takers need to get familiar with test taking strategies more systematically either in their language classes or in special strategy training courses. Strategies may not be fully reported in listening process by virtue of the necessity of cognition for the task. (Anderson, 1991; O'Malley and Chamot, 1990; Oxford, 1993) but the complexity of giving an account of listening strategies does not reject the possibility of manipulating verbal reports as data (Ericsson & Simon, 1993). Hartutlu and Cylan (2014) investigated the relationship among listening proficiency, motivation, and metacognitive strategy use. They found using translation in listening skills would not lead to success due to the interference of the first language with the process of listening. In addition, learners who were in trouble with high level of anxiety and lack of confidence were unlikely to succeed in listening. They also indicated a positive correlation between listening proficiency and extrinsic motivation in the fact of no significant correlation between listening proficiency and intrinsic motivation. In an overview of theories and practices in the field of metacognitive knowledge and language learning, Rahimi and Katal (2012) found that learners with conscious steps to understand what they are doing and using many various strategies may be more successful learners. They also indicated that using meta-cognitive strategies provide learners with the ability to plan, control and evaluate their learning, which finally leads to gaining higher achievement and better learning outcome in both face-to-face and virtual environment. Rahimi and Katal (2012) in another study aimed to investigate metacognitive listening strategies awareness among Iranian EFL university and high school students. They brought to light these students appeared different regarding to their metacognitive strategies in general and in person knowledge and mental translations. Wang (2015) on a small-scale intervention study examined the impact of a metacognitive approach to listening instruction. According to the findings of the study, metacognitive pedagogical cycle may positively affect learners listening proficiency and it may play a part in learners' growth in three aspects of metacognitive knowledge including person, task, and strategy knowledge. Rahimi and Abedi (2014) studied Iranian EFL learners listening self-proficiency and its relationship with their metacognitive awareness of listening strategies. The result indicted a positive and significant relationship between listening self-efficiency and metacognitive awareness of listening strategies in general. Further listening self-efficiency was positively and significantly related to planning-evaluation and problem solving strategies and inversely to mental translation strategies. Selamat and Kaur Sidhu (2013) investigating the effects of metacognitive strategy training on lecture listening comprehension abilities of undergraduate students in Malaysia revealed that it was difficult for first year tertiary level students to understand university lectures in English and also they had problem in keeping up their concentration during lectures. However many students were not aware of the strategies that they could use to further their understanding of lectures more effectively.

## II. METHODOLOGY

### A. Participants

Two hundred and seventy three volunteer students from Shahab Danesh Institute of Higher Education in Qom, Iran initially took the TOEFL sample test. Based on the results of the TOEFL sample test, 96 students were selected for the present study. The subjects' ages were from 20 to 24 years old. They were from three majors including Information Communication Technology (ICT), Computer Engineering, and Electrical Engineering. Of the students, 39 were females and 57 were males. The participants were grouped into three levels based on their scores on IELTS listening test: The advanced level, (Group 1), the upper intermediate level, (Group 2) and the intermediate level, Group 3). Among them, eight (i.e. four advanced and four intermediate) test takers were selected for retrospective interviews.

### B. Instrumentations

#### 1. TOEFL PBT (Test of English as a Foreign Language Paper- Based Test)

"Long man Preparation Course for the TOEFL Test" (Phillips, 1996) was selected to provide a reliable and valid test to have a group of homogeneous subjects in terms of English proficiency among 273 students. Only section two and three of this test (structure and written expression and reading comprehension) were utilized in this study. There were totally 90 (40 structure and written expression and 50 reading comprehension).

#### 2. IELTS Listening Comprehension Test

The listening test, derived from "Focusing on IELTS: Listening and Speaking Skills (Macquarie University 2004, p.44-50)", consisted of 40 questions, 27 fill-in-the-blanks and 13 multiple-choice questions. It was structured in four sections of conversations and monologues in order to measure students listening proficiency

#### 3. Cognitive and Meta-cognitive Strategy Questionnaire

As soon as the students finished the test, they were asked to fill in the questionnaire adapted from Vandergrift cited in (Archer 2002) and Vandergrift (2003) to measure cognitive and meta-cognitive strategies. The strategy questionnaire consisted of 25 Likert-scale items. It was piloted for reliability estimates prior to its actual use.

#### 4. Immediate Retrospective Interviews

The qualitative data in this study was what the test-takers had to say about their own strategy use. The interviews were carried out to gather extra information in relation to the research questions. For interview, the students were ranked in three different levels of listening proficiency based on their scores in the listening proficiency test, advanced, upper intermediate and intermediate levels. Eight participants were chosen from the subjects, four from the advanced

group, and four from the intermediate group. The interviewees were interviewed individually. The interviews were conducted in Persian and lasted about 30 minutes. First, the participants were asked about their attitudes towards learning English and listening in English. Then they listened again to the IELTS listening test but this time with pauses on each section. They were then asked to report on strategies they used when attempting to complete the listening comprehension test in their examination.

### C. Procedures

This study was carried out in four phases. **In phase one**, a sample of TOEFL PBT including only the reading and structure questions were conducted for 273 voluntary junior and senior students majoring in ICT, computer engineering, and electrical engineering in order to select a group of subjects who had a good or moderate command of English. **In phase two**, a sample of listening comprehension test derived from IELTS was administered to 96 subjects who had been selected in the first phase. **In phase three**, immediately after conducting the listening test, the students took a questionnaire on how they thought while completing the test. **For conducting the last phase**, the interview, the students were ranked in three different levels of listening proficiency based on their scores in the listening proficiency test: advanced, upper intermediate and intermediate levels. Eight people were chosen from the participants: four from the advanced group and four from the intermediate group. The interview was audio taped and transcribed for further analysis. Distributions for the cognitive and metacognitive strategies were made. The descriptive statistics of the test-takers' test scores and strategy use categorized by success were provided to see the relationship between cognitive and metacognitive strategies and the listening test performance at various listening proficiency levels. The data used in the present study were analyzed quantitatively and qualitatively. The quantitative analysis was based on the listening comprehension test scores and listening strategy questionnaire while the qualitative analysis was based on the interview transcription. The quantitative data analyzed in the study were computed utilizing the Statistical Package for Social Sciences (SPSS) 17.0.

## III. RESULTS AND DISCUSSIONS

### A. Subjects' Performance in the Listening Test

The subjects had 30 minutes to do the 40 items of the IELTS listening test. Table 4-1 presents the scores of the subjects in IELTS listening test.

TABLE 1  
THE SCORES OF ALL PARTICIPANTS IN THE IELTS LISTENING TEST

	Minimum	Maximum	M	SD	Variance
96	10	38	22	6.413	41.136

This SD shows that the subjects' scores are quite variable from 10 to 38. Moreover, with a mean of 22, about half of the total score of 40, the students had a rather high listening proficiency.

### B. Subjects' Responses to the Questionnaire

TABLE 2  
DISTRIBUTIONS FOR THE COGNITIVE AND META-COGNITIVE STRATEGY USE VARIABLES

Variable	M	SD	Skewedness	Kurtosis	Median	Mode
Cognitive Strategies	3.164	0.618	-0.77	-2.828	3.208	3.208
Meta-cognitive Strategies	3.454	0.589	-0.47	-2.808	3.682	3.052

Table 2 shows the distributions for the cognitive and meta-cognitive strategy use variables. According to the above table, the mean for cognitive strategy is 3.164, and the mean for meta-cognitive strategy is 3.454. It can be assumed that test-takers used meta-cognitive strategies more than cognitive strategies.

TABLE 3  
T-TEST RESULTS OF COGNITIVE AND META-COGNITIVE STRATEGY USE

Variable	Cognitive Strategies		Meta-cognitive Strategies		T-Test
	M	SD	M	SD	
Listening Test	3.164	0.618	3.454	0.589	0.252

In table 3, mean scores (M) and standard divisions (S) in using cognitive and meta-cognitive strategies are compared. The results of T-test show that there is a significant difference between groups in using cognitive and meta-cognitive strategies. Meta-cognitive strategies are utilized more than cognitive strategies.

TABLE 4  
DESCRIPTIVE STATISTICS BY SUCCESS

Variables	Level of Success	M	SD
EFL Listening Test Performance	Intermediate	15.735	1.543
	Upper-Intermediate	23.122	2.990
	Advanced	34.154	2.641
Cognitive Strategies	Intermediate	2.642	0.786
	Upper-Intermediate	3.367	0.737
	Advanced	3.375	1.018
Meta-cognitive Strategies	Intermediate	2.936	1.038
	Upper-Intermediate	3.740	0.568
	Advanced	3.966	0.959

Table 4 shows the mean and standard deviation for the three dependent variables across different proficiency levels. It means the test-takers of each of the three proficiency levels use meta-cognitive strategies more than cognitive ones. The difference between the advanced and upper-intermediate test-takers' use of cognitive strategies was not significant because their mean of performance is almost the same. However, intermediate test-takers utilized less cognitive strategies than advanced and upper intermediate test-takers did. That the advanced test-takers use more metacognitive strategies than the upper intermediate ones distinguished their achievement levels. As a whole, the table shows that these three groups of test-takers use more metacognitive strategies than cognitive strategies.

TABLE 5  
FACTORIAL MANOVA RESULTS FOR SUCCESS LEVELS

Dependent Variables	df	F	p	$\eta^2$	D <sup>2</sup>
EFL listening test performance	2	21.943	.000	.740	1.000
Cognitive strategies	2	.502	.000	.110	1.000
Metacognitive strategies	2	2.609	.000	.171	1.000

Table 5 presents the results of the factorial MANOVA. The results showed that there was a statistically significant difference in the use of cognitive and meta-cognitive strategies among advanced, upper intermediate and intermediate students. It can be concluded that the factorial MANOVA was significant because the small *p* values suggested that the chance of the results being attributable to Type I. error was small; and the Eta squares showed that the effects explained nontrivial portions of the variance in the dependent measures.

### C. Relationships between Cognitive and Meta-cognitive Strategies and EFL Listening Test Performance

For this purpose, Pearson Product Moment correlations between cognitive and meta-cognitive strategies and listening test performance were conducted. The results obtained are as follows:

TABLE 6  
PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN COGNITIVE STRATEGIES, META-COGNITIVE STRATEGIES, AND LISTENING TEST PERFORMANCE

		Metacognitive Strategy Use	Cognitive Strategy Use	Listening Test Performance
Cognitive Strategy Use	Pearson Correlation	0.643		0.328
	Sign. (2-tailed)	0.050		0.050
	Number	96		96
Metacognitive Strategy Use	Pearson Correlation		0.643	0.486
	Sign. (2-tailed)		0.050	0.050
	Number		96	96

As you see the results of the above table, the correlation between listening test performance and meta-cognitive strategies is 0.486 and it is significant at the 0.05 level. Table 4 also shows that the correlation between cognitive strategies and listening test performance is 0.328. Finally, the results obtained from conducting Pearson Product Moment correlations showed that the correlation between meta-cognitive strategies and cognitive strategies is 0.643 and it is significant at the 0.05 level.

### D. Qualitative Data Analysis

For the immediate retrospective interviews, the transcribed data was analyzed based on the three categories of meta-cognitive strategies, such as planning, monitoring, and evaluation and eight categories of cognitive strategies, i.e., inferencing, elaboration, imagery, summarizing, translation, prediction, memory, and retrieval. The interview was conducted on eight participants, four from the advanced, and four from the intermediate group. In the category of “**planning**” in meta-cognitive strategies, the frequency of “self-management” used by advanced listeners is much higher than that of intermediate listeners. From the comparison, when listening to the text, the advanced listener adopting selective attention and self-management understood the condition and tried to get in the frame of mind to understand English. However, the intermediate listener had comprehension difficulty due to the speed of speaking and could only focus on certain parts of the text. In the category of “**inferencing**” in cognitive strategies, advanced listeners when listening to a foreign language tried to guess the meaning of the unfamiliar idiom by the use of context and logic

and utilized inferencing strategy but intermediate listeners relied on native language and used translation instead of solving their comprehension problem through deploying other listening strategies. In the category of “**summarizing**” in cognitive strategies, the advanced listeners understood that in the listening test, there might be some modification in the speakers’ utterances and sometimes it is needed to match what is seen on the question paper with what is heard on the tape. Therefore, note taking or summarizing was considered useful for the advanced listener. Whereas the intermediate listeners considered that whatever was heard on the tape and was close to the key words used in the questions could be the best answer and did not take paraphrasing or speakers’ modifications into consideration. In the category of “**self-monitoring**” in meta-cognitive strategies, advanced listeners’ deployment is much more than the intermediate listeners are. The big difference presents the dearth of monitoring awareness in intermediate listeners. The qualitative results demonstrated that most cognitive strategies occurred in association with metacognitive strategies. For example, test-takers need to be metacognitive to use cognitive strategies such as elaboration, inferencing, and transferring.

Based on the method of stratifying groups for the 25 cognitive and meta-cognitive strategies used by the 96 subjects, the present study found that the learners used “selective attention” of planning in metacognitive listening strategies most. Besides, “evaluation” in meta-cognitive strategy is the second mostly used strategy. Accordingly, summarizing and translation as cognitive strategies were the least strategies that they utilized in the listening test performance. **The first research question** aimed mainly to investigate cognitive and metacognitive strategies used by EFL students while performing a listening comprehension test. Findings indicate that, in order to understand the listening passages, most of the learners still paid attention to bottom-up processing and relied on the meaning of words, phrases, and details while listening. The results of the study show 82% of the learners indicated that note taking was the least often used strategy and learners used “selective attention” of planning in metacognitive listening strategies most. Besides, “evaluation” in metacognitive strategy was the second mostly used strategy. Accordingly, summarizing and translation as cognitive strategies were the least strategies that the learners utilized in the listening test performance. The most frequent use of “planning” (items 1, 3, 5, 12, 16, 22) was surprising since participants had limited resources to know about the content before listening; however, they adopted the strategy of planning most frequently. **The second question** of the present study dealt with the relationship between the students’ use of test-taking strategies and their listening test performance. This study revealed that there was a positive correlation between the score of the learners in listening test performance and their total scores in the questionnaire. The analyses so far clearly support the conclusion that the use of cognitive strategies was closely related to the use of meta-cognitive strategies and that the use of both cognitive and meta-cognitive strategies were correlated with the students’ test performance to a certain degree. Although it is true to say that students easily resort to strategies to compensate for a deficit in knowledge, we cannot deny the fact that students may use strategies to obtain higher scores. **The last question of the present study** investigated the difference of the listeners’ proficiency level using their cognitive and meta-cognitive strategies. The results demonstrated that advanced listeners adopted listening strategies more frequently than did upper intermediate and intermediate listeners. The study also revealed that advanced listeners adopted metacognitive strategies more frequently than upper intermediate and intermediate listeners did. Whereas advanced listeners used 77.58% of the three metacognitive strategies; planning, monitoring, and evaluation, upper intermediate listeners utilized 68.23% of metacognitive strategies, and intermediate listeners used 34.16% of metacognitive strategies. This result is consistent with the studies by Teng (1998), Goh (1998), Vandergrift (1997,2003), and Chao (1996), the results of which suggest that high-proficient listeners adopt more strategies than low-proficient listeners and the use of metacognitive strategies; planning for listening, self-monitoring, and evaluation of one’s own performance and problems, are associated with better listeners. The main reason might be that advanced listeners understand the conditions better and it helps them arrange for those conditions. Since the strategy of self-management focus on the relation of listeners’ comprehension of the conditions, which is similar to the top-down processing in listening comprehension, this can reflect that advanced listeners tend to understand the conditions in order to accomplish listening tasks successfully. Moreover, intermediate listeners adopted slightly more “directed attention” than advanced listeners did. In contrast, advanced listeners and somehow upper intermediate listeners, used more “self-management” and “selective attention.” Accordingly, advanced listeners appeared to use “elaboration” strategies more effectively, and accumulated meaning as the new linguistic input interacted with previous knowledge sources.

#### IV. CONCLUSION

This study was motivated by the theory that students’ differences in listening test performance can be related to their characteristics (Bachman, 1990). The findings of this study suggested that cognitive and meta-cognitive strategy use could explain variation in language test performance. The use of cognitive and meta-cognitive strategies across the different proficiency groups (advanced, upper intermediate and intermediate groups) differed quantitatively and qualitatively. The results of the present research showed that the test-takers utilized meta-cognitive strategies more than cognitive strategies. In addition, according to the findings of the present the use of cognitive and, particularly, meta-cognitive strategies can account for variation in language test performance across different achievement groups. By comparing advanced, upper intermediate and intermediate listeners’ performance during the listening test, the quantitative and qualitative analyses in the present study provided an insight into the variations in the strategies listeners at different proficiency levels may employ. The advanced listeners’ strategies can provide instructors useful teaching

guidelines to design various activities for students to practice. The present study assured the crucial need for teaching metacognitive strategies to EFL listeners. Students need to be taught how to listen, reflect on listening process, and consciously use the metacognitive strategies of planning, monitoring, and evaluation.

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