

## **On The Relationship between Test-Taking Strategies and EFL Reading Performance\***

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### **Abstract**

To succeed in tests does not require only content knowledge. Test-taking strategies are other factors which help students to achieve high scores in tests. The present mixed-method study set out to examine the relationship between test-taking strategies and reading test performance. To achieve the objectives of the study, a reading comprehension test, and a 35-item Likert type strategy questionnaire were given to 214 male and female university students. Analysis of the gathered data revealed that there was a positive relationship between test-taking strategies and reading test performance and that successful, moderately, successful, and unsuccessful test-takers differed in their use of cognitive and metacognitive strategies. To gain an in depth view on strategy use pattern of the test-takers, retrospective interviews along with think-aloud protocols were applied which revealed the use of metacognitive test-taking strategies more than cognitive ones. These findings can have beneficial implications for language testers, teachers, learners, and course developers.

**Key words:** Test-taking strategies, Cognition, Metacognition, Reading comprehension, Test performance.

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### **Introduction**

It is common knowledge that some people are more successful at taking tests than others. A variety of factors exist which together or independently influence the success with which a test-taker will perform on the test. The reason that some readers perform better in reading tests goes back to the process of the reading and that how readers deal with the text while performing the test, and what factors influence their performance. This study was motivated by the assumption that the variability in language test performance can be attributed to test-taker characteristics. Bachman and Palmer's (1996) current model of language ability served as a basic framework for the present study to examine two sets of factors, i.e., English reading comprehension ability as language ability and cognitive and metacognitive strategy use as part of test-takers characteristics. In their model language knowledge, strategic competence, and affect are demonstrated to interact with one another during language use.

So test-takers' test performance is directly related to two main factors. First their knowledge of test content and second their test-taking strategies. Consequently, test-takers can improve their performance on test and consequently test results by applying test-taking strategies whatever their content knowledge is. So appropriate use of cognitive and metacognitive strategies can be an additional tool for test-takers to get better results. Therefore, a positive relationship is expected between test-taking strategies and test performance.

The present mixed-method study aimed at investigating the relationship between test-taking strategy use and EFL reading test performance for successful and unsuccessful test-takers and presenting a pattern for test-taking strategy use among them. Based on this purpose the following three research questions were addressed as follows:

1. Is there a relationship between test-taking strategy use and test-takers' reading test performance?

2. How much variance in reading test performance can be explained by cognitive and metacognitive test-taking strategy use?
3. Do highly successful, moderately successful, and unsuccessful test-takers differ in their use of cognitive and metacognitive strategies?
4. What's the pattern of test-taking strategy use among Iranian EFL test-takers?

### **Review of the literature**

Research on test-takers' processes of taking tests has grown since the late 1970s (Abraham & Vann, 1996; Cohen; 1998; Cohen, 1984) and scholars have been interested in considering the strategies that respondents use in the process of performing a language test (e.g., Cohen & Aphek, 1979; Homburg & Spaan, 1981, etc.). Specifically throughout the 1980s and 1990s, there has been an interest shifting from universal processes in second language acquisition (SLA) and foreign language learning (FLL) to cognitive and affective factors affecting individual differences in the rate and route of SLA Processes including attention paid to the impact of test taking strategies in international research (Kashkoulia & Barati, 2013; Nikolov, 2006; Xu & Wu, 2012).

The dictionary meaning of the word *strategy* carries notions of planning, directing, and managing things well for a certain purpose (Hornby, 1990, p. 1270). According to the widely-used technical definition from cognitive psychology, strategies are "operations employed by the learner to aid the acquisition, storage, retrieval, and use of information" (Oxford, 1990, p. 8). For Lenz, Ellis, and Scanlon (1996) "An individual's approach to a task is called a strategy when it includes how a person thinks and acts when planning, executing, and evaluating performance on a task and its outcomes" (p. 5).

Language learners always need to tap various strategies in their learning and use of language. Due to high impact of test results on individuals' lives, test-taking situation is one of the cases that call for exploitation of the learners' strategic

competence, because a kind of compensation and remediation is required for the lack of knowledge and skills to respond to a given task.

### **Strategic competence**

Strategic competence is the ability of speakers to use verbal and non-verbal communication strategies to compensate for breakdowns in communication or to improve the effectiveness of communication (Richards & Schmidt, 2002). Savignon (2002, p. 278) describe strategic competence as “Ability to compensate for imperfect knowledge of linguistic, sociolinguistic, and discourse rules or limiting factors in their application such as fatigue, distraction, inattention; the effective use of coping strategies to sustain or enhance communication.” According to Fulcher and Davidson (2007), strategic competence is “the knowledge of how to overcome problems when faced with difficulties in communication” (p.38). Canale and Swain (1980) also define strategic competence as “the verbal and nonverbal communication strategies that may be called into action to compensate for breakdowns in communication due to performance variables or due to insufficient competence.” The common point about all definitions is that they all regarded strategic competence as a compensatory tool called upon facing a communicative limitation.

During the history of language learning various models have been presented for communicative competence in all of which strategic competence is a vital subcomponent. As one of the oldest models Canale and Swain's communicative competence model (1980) includes grammatical competence, sociolinguistic competence, discourse competence, and strategic competence. The initial form of their model included the first three subcategories and strategic competence was later added in the revised version. According to Oxford (1990), also communicative competence consists of these four elements of grammatical competence referring to mastery of the linguistic code, sociolinguistic competence including the ability to comprehend and the use of speech acts in appropriate social contexts,

discourse competence that is expressing ideas that are cohesive in form and coherent in thought, and finally strategic competence, referring to the ability to use strategies to compensate for language knowledge limitations (p. 9). In yet another model, Celce-Murcia, Dornyei, and Thurrell (1995) divided communicative competence into five linguistic, sociolinguistic, discourse, strategic and actional competences where actional competence refers to more formulaic aspects of language such as the oral speech acts or the written rhetorical moves that function as part of communicative competence.

However, the term “strategic competence” has had a broader meaning since Bachman (1990) provided a theoretical model of strategic competence by dividing it into three elements. His communicative language ability (CLA) model states that the three components of CLA interact with one other and with the characteristics of the language use context, the test task, and other mental schemata (Bachman, 1990, p.84). These three components are language competence, defined as “a set of specific knowledge components that are utilized in communication via language”, the psychological processes involved in the actual execution of language as a physical phenomenon, and strategic competence defined as “the mental capacity for implementing the components of language competence in contextualized communicative language use” (p.84).

Later, this model was revised by Bachman and Palmer (1996) into three categories as: goal-setting that is deciding what one is going to do, assessment which is taking stock of what is needed, what one has to work with and how well one has done, and planning referring to deciding how to use what one has, because learners need to assess which communicative goal is achievable and what linguistic resources can be used.

As a result of these two models by Bachman (1990) and Bachman and Palmer (1996) strategies are not viewed as compensatory any longer; rather, they are considered as part of active cognitive processes adopted by language learners to complete the given task. This approach clearly subsumes the possibility of strategies as

construct relevant and is a solution to Cohen's (1994) concern on construct validity of the test items requiring strategies in the process of being answered. Cohen (1994) considered strategies (e.g., test-taking strategies) as construct irrelevant concepts that are tied mostly to the test method effect. That is, a distinction could be made between test/task (i.e., method) specific processes and processes that underlie the ability (construct) of interest. The new approach was, however, a response to this concern.

### **Test-taking strategies**

Test-taking strategies are those strategies which are used by individuals in taking a test. There are certain types of strategies which are used by test-takers during a test-taking course (Cohen & Upton, 2007; Hirano, 2009), these include strategies which learners apply while solving test tasks and can be "viewed simply as learner strategies applied to the area of assessment" (Cohen, 1994, p. 119).

Various definitions have been provided for test-taking strategies. For Brush (1981) test-taking strategies are any discrete tactics, rules, or procedures that increase the probability of successful solution of common test questions. As Cohen (1994, p.119) defines, test-taking strategies can be "viewed simply as learner strategies applied to the area of assessment". Meanwhile, Jimenez et al. (1996) refer to test-taking strategies as operations or steps used by test-takers to facilitate the retrieval of information and classify them into four groups of reader-initiated strategies, text initiated strategies, bilingual strategies and interactive strategies.

Allan and MacLennan (1997) define the construct "test-taking strategy" as the "ability to note and exploit weaknesses in objective language test items to arrive at the keyed answers, without using the skills or knowledge that the items were designed to elicit or measure" (p. 1). Additionally, Cohen (1998) defines test-taking strategies as "those test-taking processes that the respondents have selected and of which they are conscious, at least to some degree [and] the notion of strategy implies an element of selection" (p. 92). According to Rogers and Harley (1999), test-taking strategies enable

learners to use the characteristics and format of a test to increase scores in a test-taking situation. These strategies include: reading the instructions carefully, scheduling the allocated time appropriately, making use of clue words in the questions, delaying answering difficult questions, reviewing the work in order to check the answers, etc.

Nikolov (2006) considers test-taking strategies as those techniques which users of the target language employ when responding to language test tasks and we believe that their successful use depends on how appropriately test-takers apply them to a given task. In a more recent definition Cohen and Upton (2007, p. 211) consider test-taking strategies as “those test-taking processes which respondents have selected and which they are conscious of, at least to some degree”. All in all considering the so far provided definitions for test-taking strategies the following features can be induced from them:

1. They are applied in test and assessment situation.
2. They can increase the probability of providing the correct response and consequently can increase test score.
3. They are applied consciously.
4. They are selective.
5. They require appropriate application to be effective.

To consider the nature and subcomponents of test-taking strategies two well-known categories have been proposed. In the older one, Cohen (1998) believed that test-taking strategies consist of language use strategies and test-wiseness strategies. Language use strategies refer to actions that individuals consciously take to enhance the use of a second/foreign language in order to accomplish language tasks. In most cases, examinees need to use four types of language use strategies (i.e., retrieval, rehearsal, cover, and communication strategies) in a testing situation so that they can store, retain, recall, and apply the information for use on the test. In contrast, test-wiseness

is not necessarily determined by the examinee's language proficiency, but rather is concerned with his knowledge of how to take tests.

But in a more recent model Cohen (2006), suggested that test-taking strategies can be divided into three largely distinct sets: language-learner strategies (i.e., the ways that respondents operationalized their basic skills of listening, speaking, reading, and writing as well as the related skills of vocabulary learning, grammar, and translation), test-management strategies (i.e., strategies for responding meaningfully to the test items and tasks), and test-wiseness strategies (i.e., strategies for using knowledge of test formats and other peripheral information to answer test items without going through the expected linguistic and cognitive processes).

### **Cognitive and metacognitive strategies**

Various classifications have been presented for strategies (e.g., Rubin, 1987; Oxford, 1990; O'Malley & Chamot, 1995) which have some differences in comparison but they all share two common strategies namely cognitive and metacognitive strategies.

Cognitive strategies are strategies that directly involve the target language and involve using many different methods, such as summarizing and deductive reasoning, to process, understand, and produce the new language (Cohen 1998, O'Malley & Chamot, 1990; Oxford, 1990).

On the other hand, as Davine (1993) and Flavell (1981) define metacognitive strategies are those strategies that function to monitor or regulate cognitive strategies. They include "checking the outcome of any attempt to solve a problem, planning one's next move, monitoring the effectiveness of any attempted action, testing, revising, and evaluating one's strategies" (Baker & Brown, 1984, p.354). For Anderson (2005) metacognition "is the ability to make your thinking visible. It is the ability to reflect on what you know and do and what you do not know and do not do" (p.767).

According to Hwang and Lee (2009) cognitive strategies are used for understanding and recalling new information, and metacognitive



strategies are applied to regulate test-takers' cognition and assess their progress. So while cognitive strategies can be defined as the test-takers' ongoing mental activities to use their language and world knowledge to solve the given tasks, metacognitive strategies are a higher order executive processing that provide a cognitive management function in language use and other cognitive activities. They are the test-takers' deliberate mental behaviors for directing and controlling their cognitive strategy processing for successful performance. In other words, metacognition or thinking about thinking is the ability to stand back and observe oneself.

Aek Phakiti (2008) has also defined cognitive strategies as "actual concise behaviors that individuals use to process language to understand, learn, or use in some context". For him cognitive strategies are composed of "comprehending," "memory," and "retrieval" strategies. Metacognitive strategies are defined as "conscious processes that regulate cognitive strategies and other processing." Metacognitive strategies are composed of "planning," "monitoring," and "evaluating" strategies (Phakiti, 2008).

### **Empirical studies on test-taking strategies**

Unlike extensive research regarding learning strategies, research on test-taking strategies used to receive less than adequate attention and was neglected. But recently there have been a few studies on its various aspects which have paved the way for further investigations. On the other hand, there have been some studies on text-processing strategies but the number of studies on test-taking strategies of reading is still really limited. Generally five areas of research can be considered for the test-taking strategies so far including: studies for validation purposes, studies to examine the effect of testing methods on the role of strategies, studies to examine the effectiveness of strategy instruction for improving performance on standardized test, studies to investigate the relationship between language proficiency and test-taking strategies, and studies to investigate the relationship between test-taking strategies and performance of various types of tests. The present study is more in line with the last two types of

studies in the related literature. A very brief report on the most prominent and recent studies is presented here.

Cohen's study (1984) is considered as one of the early studies on test-taking strategies in order to identify the test-taking strategies of EFL learners in multiple-choice reading comprehension tests. He used self-report data and identified the following strategies: reading just part of the passage and then searching for a corresponding question, matching words and phrases in the distracters or the stem with those in the passage, considering the questions before the passage, applying a fast, surface reading of the passage rather than a detailed reading, also stopping reading distracters when readers found what they judged to be a correct response.

Rezaee (2005) reported a high correlation between the participants' achieved scores and their test-taking strategy use. He also found that the degree of test-taking strategy use varies in different sections of the test. Nikolov (2006) investigated children's test-taking strategies during reading and writing tests and reported what they thought while doing these tests. She reported that some strategies involve cognitive processes and personality traits while others involve tiny tricks. Phakiti (2008) also found a positive relationship between cognitive and metacognitive strategies and reading test performance. He realized that successful test-takers applied more test-taking strategies than unsuccessful ones. In a more recent study, Stathopoulou and Nikaki (2009) investigated the test-taking strategies of Greek users of English claimed in the questionnaire to be used in the different modules of Greek State Language Exams known as KPG test and identified the most and the least common cognitive and metacognitive strategies.

In a qualitative study Rubb, Fuene, and Choi (2006) applied interview and think-aloud protocol to examine the amount of test-taking strategies during reading test and found that strategies differed based on the characteristics of multiple-choice reading questions and that reading comprehension for test-taking was not the same as that in non-testing situations.

Phakiti (2006) used structural equation model to examine the nature of cognitive and metacognitive strategies in reading tests. He concluded that memory and retrieval strategies facilitated EFL reading test performance via comprehending strategies; monitoring strategies performed an executive function on memory strategies, whereas evaluating strategies regulated retrieval strategies; planning strategies did not directly regulate memory, retrieval or comprehending strategies, but instead regulated these cognitive strategies via monitoring and evaluating strategies; and that only comprehending strategies were found to directly influence EFL reading test performance. He also investigated the relationship between cognitive-metacognitive strategies and EFL reading test performance and found out that the degree of relationship between strategies varied depending on the function of cognitive processing.

Cohen and Upton (2007) also determined the test-taking strategies EFL test-takers benefited from while responding a subtest of TOEFL. Their findings revealed that highly proficient test-takers mainly used academic reading skills to gain local and general understanding of the test, but other test-takers used more test-taking and test-management strategies.

Phakiti (2003) found that cognitive and metacognitive strategies were both positively correlated with the reading test performance. In the same vein Song (2004) examined the role of cognitive and metacognitive strategy use in test performance and found that they both accounted for a large part of the test scores. In a more recent study Rezvani and Tavakoli (2013) also reported a strong positive correlation between cognitive-metacognitive strategies and performance on the reading section of IELTS test. Goudarzi and Ghonsooly (2014) realized that learners' meta-awareness and test-taking strategy use significantly affected their test performance and their final achievement score. They also found a significant positive correlation between meta-awareness and test-taking strategy use during the test.

Zhang et al (2011) explored the frequency of application for each test-taking strategy and reported that EFL learners at the tertiary level had a medium use of English test-taking strategies and that the most frequently used strategies by students were compensation strategies, followed by affective, metacognitive, social, cognitive, and memory strategies. They also reported that different categories of English test-taking strategies and overall strategy use were all significantly correlated with one another. With regard to text difficulty, Xiao (2006) found that strategy use was affected by difficulty level of the passage and that more successful students used more metacognitive strategies than less successful ones. Considering topic familiarity in reading comprehension tests Lee (2011) compared the strategies used in reading tests of familiar and unfamiliar topics and did not find a significant difference.

Yien (2001) found a significant relationship among test-taker characteristics, test-taking strategies, and test performance. He claimed that test-taking strategies may play a role in mediating between test-taker characteristics and test performance. Anani Sarab and Seif Reihani (2010) in their findings reported that test-takers used both contributory and non-contributory strategies to correctly answer reading test-items and that contributory and non-contributory strategies functioned differently based on the difficulty level of the texts.

According to Kashkouli and Barati (2013) a pattern can be drawn of the type of strategies used by three proficiency levels of language, but the pattern changes in times depending on the ability of the test takers and the type of tasks. In their study on test-wiseness strategies on PBT and IBT Tavakoli and Hayati Samian (2014) did not find a significant difference in the employment of test-wiseness strategies between the test-takers higher and lower than the mean in grammar test. They found “reading the instructions carefully before the items” as the most and “revising an answer to correct misspellings” as the least frequent strategies.

Jamil, Abd Aziz, and Abdul Razak (2010) investigated the test-taking strategies used by low and high proficient learners in reading test and, surprisingly, did not find a significant difference between them. Pourdana et al. (2012), in contrast with the results of previous similar studies, did not find a significant correlation between reading comprehension scores and test-taking strategies but they found a negative correlation between reading comprehension scores and test management strategies.

Scharnagl (2004) conducted an experimental study on the effect of test-taking strategy instruction on reading achievement of low-performing third grade students and found it quite effective. Raojevic's research (2009) also revealed the effectiveness of providing students with explicit strategy instruction when reading and responding to different forms of texts. Pour-Mohammadi and Zainol Abidin (2012) also investigated the effect of test-taking strategy instruction on reading performance of EFL learners and found it significantly effective.

Each of the studies reviewed in this section and some more not mentioned in this paper had considered a particular aspect of test-taking strategy in EFL context and tried to shed some light on it. The present study also focused on this issue in EFL context of Iran in which reading performance is included as the main part of almost all high and low stake EFL tests.

## Method

### Participants

A total of 214 Iranian male and female EFL university students majoring in English Literature, Teaching English and Translation participated in this study. The participants were chosen from students who had Reading Comprehension (III) as a compulsory undergraduate course for sophomores of English major. The selection of participants of the study was based on convenience sampling.

### Data collection instruments

A standardized reading comprehension test which was in fact the reading comprehension section of a complete test of English proficiency was used to assess the participants' reading comprehension proficiency. This test included three passages along with 33 multiple choice items. The reliability of the test was computed through KR-21 method of calculating reliability and the index obtained was 0.63.

To measure cognitive and metacognitive strategies a thirty five-item questionnaire was taken from a similar study on strategies by Phakiti (2003). The questionnaire items in the study were similar to Purpura's (1999), but adjusted to suit a reading test. Using Cronbach alpha, the reliability of the questionnaire was found to be 0.96. The questionnaire is a five-point Likert scale with 5 scale responses. The items were in the form of statements and the participants graded their answers on this scale from one to five points including never, sometimes, often, usually, and always.

#### **Data collection procedures**

The participants were asked to take a reading comprehension test, and a cognitive-metacognitive questionnaire on how they think while completing the test in their regular reading tests. To reduce any order effect of the instruments counterbalancing was used. Regarding the time, they were allowed as much time as they needed to complete the two instruments. These students were divided into three groups of successful (N=61), moderately successful (N=108), and unsuccessful (N=45), according to their total grades on the reading comprehension test. Group A with scores over one SD above the mean score, group B with scores between one SD above and below the mean score, and group C with scores under one SD below the mean score.

Each participant received two scores: a reading score whose possible range was 0-33 and a 35 strategy scores with a possible range of 1-5 for each item. Each correctly chosen answer on Reading Test gained one point. No negative points were given to wrongly chosen responses. The answers to each item on the questionnaire received scores from 1 for the lowest frequency to five for the highest. The subjects were asked to mark only one choice for each item.

In order to recheck and reassure what counts as evidence triangulation was used in this study. It was accomplished by checking the data from the test and the questionnaire against the data from the retrospective interview. The only relevant qualitative data in this study was what the test-takers had to say about their own strategy use. Furthermore, such instruments used in this study could help students develop greater awareness of the strategies they employed during reading.

Six of these students (three successful, and three unsuccessful) accepted to cooperate with the researcher in retrospective interviews. During interview sessions first the participants were asked about their attitudes towards learning English and reading in English. They were then asked to report on strategies they used when attempting to complete the reading comprehension test. At this stage they were provided with the reading comprehension test to help them how they thought. They were then given ten minutes to do a reading test. It consisted of a short reading comprehension passage and five multiple-choice comprehension questions taken from Shiraz University Proficiency Test (SUPT TEST). The participants were asked to carry out this activity the way they would do in a real test. They were then asked about their strategy use when trying to comprehend the reading passages and answering the questions. It appeared that the interviewees reported test-taking strategies rather than reading strategies because they were asked to explain the reason for choosing a specific choice in a specific item.

Participants were allowed to respond in their native language so that speaking ability would not interfere with their ability to express the strategies. Each interview lasted about 20 minutes. All interviews were audio taped with the participants' consent. The interviews were then completely transcribed and even some of the observed actions of the participants were included. The data were transcribed according to He's transcription conventions (1998 cited in Soria, 2001) As Green (1998) suggests a unit of analysis which would be a phrase, a clause or a sentence should be identified for the purpose of segmenting verbal

reports. In the present study, not only the phrases and the sentences were taken to be the unit of analysis, but special actions taken by the participants in answering the questions were also taken into consideration because they were all found to be informative. Following that, the participants' statements were segmented by / and their action by {{ }} at the end of each unit. Having transcribed and segmented the data, a coding scheme was developed to codify the knowledge sources used by each participant. In doing so, Oxford's (1990) taxonomy of language learning strategy was set as the base. In order to codify the protocols, each segment providing a knowledge source was taken into account and an appropriate strategy code was specified for it.

In order to calculate the reliability of the codified protocols 10 percent of the whole data was randomly selected and recodified by the researcher after the time interval of 10 days. For this sample, thirteen segments out of fourteen were recodified in the same way. Consequently, the intra-coder reliability index was 0.92. In order to calculate the inter-coder reliability index of the protocols, another researcher who was familiar with the codification procedure recodified about 20 percent of the whole tape scripts. Twenty nine segments out of the thirty six segments were codified the same way the researcher had done before. As a result, the inter-coder reliability index was 0.85.

### Findings and discussion

#### Data from test and questionnaire

Pearson Product Moment Correlation formula was used to investigate the relationship between cognitive and metacognitive strategy use and reading test performance separately. The results are presented in Table 1.

Table 1: *Correlations between cognitive/metacognitive strategy use and reading test performance*

	Reading test performance	Cognitive strategies	Metacognitive strategies



Reading test performance	1	.61 (**)	.68 (**)
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As presented in Table 1 there exists a significant positive correlation between cognitive test-taking strategy use and reading test performance ( $r(212) = 0.61, p < 0.05$ ) and between metacognitive test-taking strategy use and reading test performance ( $r(212) = 0.68, p < 0.05$ ).

A multi-linear regression was calculated to predict reading comprehension performance based on cognitive and metacognitive test-taking strategies, that is to identify the extent to which cognitive and metacognitive strategies influenced reading test performance, while the predictors were cognitive test-taking strategies, and metacognitive test-taking strategies, and the dependent variable was reading test performance. Tables 2 and 3 reflect the results of this analysis.

Table 2: *The predictability power of the model*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.702(a)	.493	.485	.50318

Table 2 illustrate that 49.3 percent of variance in reading test performance can be explained by the model (cognitive strategies, and metacognitive strategies). This is quite a respectable result particularly when compared to some of the results reported in journals.

Table 3: *ANOVA*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	51.635	3	17.212	67.980	.000(a)
	Residual	53.169	210	.253		
	Total	104.804	213			

Table 3 shows the statistical significance of the result. It means that the model can significantly predict the variance in reading test performance. A significant regression equation was found ( $F = (3,210) = 67.98, P < 0.05$ ) with an  $R^2$  of 0.49.

Later the amount of contribution of each variable included in the model (metacognitive and cognitive strategies) to the prediction of reading test performance was investigated. Table 4 illustrates which of these variables contributed to the prediction of reading test performance.

Table 4: *The predictability power of each component of the model*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.046	.429		.108	.914
	Metacognitive strategies	.018	.004	.522	4.084	.000
	Cognitive strategies	.013	.009	.191	1.501	.135

Table 4 vividly presents that the Beta for metacognitive strategies is larger (Beta= 0.52), which means that this variable makes the strongest contribution to explaining reading test performance ( $t=4.08, p < 0.05$ ). Cognitive strategies made less of the contribution (Beta= 0.19,  $t=1.50, p < 0.05$ ).

Furthermore, in order to find whether test-takers in three different levels of success, i.e., highly successful, moderately successful, and unsuccessful, differed in their use of cognitive and metacognitive strategy one-way ANOVA was used. Tables 5 and 6 present the results of ANOVA test for metacognitive test-taking strategies.

Table 5: *Metacognitive strategy use difference in three groups of success*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42483.900	2	21241.950	101.806	.000
Within Groups	44025.277	211	208.651		
Total	86509.178	213			

As the results in Table 5 shows there is a significant difference in metacognitive strategy use of test-takers in three different levels of success. An analysis of variance showed that the effect of metacognitive was significant, ( $F(2,211) = 101.81, P < 0.05$ ) so there is a statistically significant difference in the metacognitive test-taking strategy use between all three success groups. In order to know which of the specific groups differed, post-hoc analysis was done. Table 6 reflects the results of post-hoc analysis.

Table 6: *Post hoc test*

(I) success groups	(J) success groups	Mean Difference (I-J)	Std. Error	Sig.
unsuccessful	moderately successful	-22.8056(*)	2.56293	.000
	successful	-40.4973(*)	2.83852	.000
moderately successful	unsuccessful	22.8056(*)	2.56293	.000
	successful	-17.6917(*)	2.31354	.000
successful	unsuccessful	40.4973(*)	2.83852	.000
	moderately successful	17.6917(*)	2.31354	.000

As shown in Table 6 there was a statistically significant difference between the three success groups as determined by one-way ANOVA ( $F(2, 211)=101.81, P<0.05$ ). A Tokay post-hoc test revealed that the use of metacognitive test-taking strategies was statistically significantly different among all three success groups of successful, moderately successful, and unsuccessful. The second one-way ANOVA was applied to present cognitive test-taking strategies, the result of which is shown in Table 7.

Table 7: *Cognitive strategy use difference in three groups of success*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10109.033	2	5054.516	88.892	.000
Within Groups	11997.739	211	56.861		
Total	22106.771	213			

Table 7 reflects a significant difference in cognitive strategy use of test-takers in three different levels of success ( $F(2,211) =88.89, P<0.05$ ) so there is a statistically significant difference in the cognitive test-taking strategy use between success groups. Again a post-hoc analysis was done to know which of the specific groups differed. Table 8 presents the results of post-hoc analysis.

Table 8: *Post hoc test*

(I) success groups	(J) success groups	Mean Difference (I-J)	Std. Error	Sig.

unsuccessful	moderately successful	-8.1833(*)	1.33794	.000
	successful	-19.3049(*)	1.48180	.000
moderately successful	unsuccessful	8.1833(*)	1.33794	.000
	successful	-11.1216(*)	1.20774	.000
successful	unsuccessful	19.3049(*)	1.48180	.000
	moderately successful	11.1216(*)	1.20774	.000

Table 8 shows that the use of cognitive test-taking strategies was statistically significantly different among all three success groups of successful, moderately successful, and unsuccessful.

### Data from interviews

Data gathered from the transcription and codification of the recorded interviews were entered into SPSS. Since the number of cognitive and metacognitive test-taking strategies for each successful and unsuccessful participant was counted the obtained data were of nominal nature. Chi-square formula which deals with comparison of frequencies was consequently applied to find out whether there was a difference between successful and unsuccessful test-takers in their cognitive and metacognitive strategy use. Tables 9 and 10 reflect the results.

Table 9: *Success\* strategy cross tabulation*

		Strategy		Total	
		cognitive	metacognitive		
Reading Performance	successful	Count	35	82	117
		Expected Count	53.6	63.4	117.0

	unsuccessful	Count	36	2	38
		Expected Count	17.4	20.6	38.0
Total		Count	71	84	155
		Expected Count	71.0	84.0	155.0

Table 10: *Chi-Square Test*

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	48.553(b)	1	.000		

As shown in Table 10 there is a significant difference between successful and unsuccessful test-takers in using both cognitive and metacognitive test-taking strategies. While successful test-takers use metacognitive test-taking strategies (N= 82) more than cognitive test-taking strategies (N= 35), for unsuccessful test-takers the number of metacognitive strategies (N= 2) is much less than cognitive strategies (N= 36).

To put it in a nutshell these findings answered the research questions revealing that:

1. Reading test performance is positively related with both metacognitive and cognitive test-taking strategies.

2. Almost half of the variance in reading test performance (%49.30) can be explained by these two test-taking strategies and metacognitive strategy plays a greater role in this variance.
3. Three groups of successful, moderately successful, and unsuccessful test-takers differed in their use of both metacognitive and cognitive strategies.
4. Metacognitive test-taking strategies are applied more than cognitive test-taking strategies and the difference is much more among successful test-takers than unsuccessful ones.

Test-takers' test performance is directly related to two main factors. First their knowledge on test content and second their test-wiseness. Test-takers' can improve their performance on test and so test results by applying test-taking strategies whatever their content knowledge is. So appropriate use of cognitive and metacognitive strategies can be an additional tool for test-takers to get better results. Therefore a positive relationship is expected between test-taking strategies and test performance.

All pieces of previous research also showed that there is for sure a positive relationship between test-taking strategies and test performance in general (Yien, 2001; Purpura, 1999) and reading test performance in particular (see for example, Phakiti, 2003; Bornholt, 2002; Paris et al., 2000). Positive effect of test-taking strategies instruction on test performance (Amer 1993) as well as on reading test performance (Carrell, Pharis & Liberto 1989) also implies the fact that there is such a positive relationship between these two variables. And as expected the present research found such a significant positive correlation between cognitive/metacognitive test-taking strategies and reading test performance.

Generally, the results revealed the fact that the variance in reading test results can be predicted by cognitive and metacognitive test-taking strategies, but metacognitive strategy is a stronger predictor. The reason for such a finding can be attributed to the positive relationship between cognitive/ metacognitive strategies and reading

test performance. The reason for metacognitive strategies' greater prediction can again be related to the nature of these strategies. As explained previously metacognitive strategies play an execute role over cognitive strategies and are not limited to a specific subject. So they can be stronger predictors than cognitive strategies.

Test-takers at three levels of success differ in their use of cognitive and metacognitive strategy use. But the difference in metacognitive strategies use was greater than cognitive strategies. This finding is in line with what Hojjati (1998) came across with as Iranian university students reported to apply metacognitive strategies the most, but cognitive strategies were reported to be used at medium level of frequency. The reason for this finding can be traced in different natures of these two strategies. As previously mentioned cognitive strategies are more limited to specific tasks and involve more direct manipulation of the learning material itself. Metacognitive strategies are, on the other hand, higher order executive skills that may entail planning for, monitoring, or evaluating the success of an activity (O'Mally & Chamot, 1995). Metacognition is considered by most educators to be an element necessary for many cognitive learning tasks (Li & Munby, 1996). So the term metacognition refers to one's understanding of any cognitive process (Brown, Armbruster, & Baker, 1983, p. 49).

In other words, students have knowledge about their cognitive processes and are able to use that knowledge to choose the most efficient strategies for problem solving. Simply stated, metacognition is the ability to stand back and observe oneself. It is also the ability often related to competent performance in any area of problem solving (Block, 1992, cited in Li & Munby 1996). And as Olshavsky's (1977) theoretical position reveals reading is a problem solving process. Flavell (1992) also argue that metacognitive strategies are especially likely to occur in situations that stimulate a lot of careful, highly conscious thinking. In an EFL context such as Iran students are more conscious about their performance on EFL tasks and generally apply



those strategies which considerably help them have control over their performance.

The information provided by the participants on interview sessions also demonstrated that EFL reading test performance is a complex process in which test-takers consciously and actively invoked a repertoire of metacognitive strategies. So it is clear that metacognition, as cognition on cognition, is vital in test-taking and can influence test results more than cognitive strategies.

The model provided by Bachman and Palmer (1996), which was also applied in this study, can be regarded as a turning point in views toward test-taking strategies, because it observes test-taking strategies as active cognitive processes in completing a test task and accordingly construct relevant, so the problem of seeing them as a source of “test pollution” is obviated and instruction of these strategies seems to be logical, fruitful, and vital.

The findings of the present study also suggest support for training EFL classroom teachers to provide instruction in test-taking strategies for two main reasons. First the information provided by the participants on interview sessions demonstrated that EFL reading test performance is a complex process in which test-takers actively used strategies, so due to the demanding nature of EFL reading test, the teaching of specific test-taking strategies in English Reading classes is required. And second the positive relationship between test-taking strategies and test performance makes test-taking strategy instruction necessary, but in spite of this positive relationship, instruction in test-taking is not commonly included in curriculum and instruction (Cuthersone, 1979; cited in Ritter; Idol-Maestas, 1986).

### **Conclusion**

This study was an attempt to find out the relationship between test-taking strategies and reading test performance of EFL learners. The results reveal that test-takers used metacognitive strategies more frequently than cognitive strategies and that there is a positive relationship between cognitive and metacognitive strategy and reading

test performance. Cognitive strategies and metacognitive strategies predicted a good deal of variance in reading test performance, but metacognitive strategies had a greater role in this prediction. It was also found that highly successful, moderately successful, and unsuccessful reading test-takers differ significantly in their cognitive and metacognitive strategy use.

The findings had both theoretical and pedagogical implications highlighting that test-taking strategy training should not be abstract and theoretical, but should be highly practical and useful for test-takers. Teachers must do task analyses of strategies to be taught. In other words, teachers must think about how a particular strategy is best applied and in what contexts. Teachers can observe students as they perform reading tests in order to determine their strengths and weaknesses in terms of strategy use, which in turn will help in providing effective and appropriate strategy instruction. Teachers must teach strategies over the entire course, not just in a single lesson or unit allowing strategic instruction to permeate the curriculum. They also must provide students with opportunities to practice strategies they have been instructed.

Variations in test scores due to variable use of strategies usually are regarded as random variance. However, strategy use is better viewed as one source of “test pollution” because it contaminates the scores and interpretation of the results (Haladyna, Nolen & Haas, 1991). In the same line, individuals involved in test development, administration, and interpretation need to be aware of the full range of components of language ability and should carefully consider the construct of test-wiseness and how applying strategies affect scores.

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