LEARNING STRATEGIES IN PROFICIENT AND LESS PROFICIENT READERS IN MEDICINE

By

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ABSTRACT

The current study aimed to diagnose the probable significant differences in the use of language learning strategies among medical-text readers of opposite sex from different levels of proficiency. 120 (N=120) participants were randomly selected from Azad Medical University of Mashhad: 60 medical students (age range 23-25; 30=male and 30=female) and 60 professors (age range 45-55; 30=male and 30=female). They took the Strategy Inventory for Language Learning (SILL) questionnaire. Their responses to the 50 items on the questionnaire were totaled and sets of scores were obtained for overall, direct, indirect, memory, cognitive, compensative, metacognitive, social, and affective strategies. Independent samples 't'-tests were performed for the analysis of the data. Results after analysis of the data showed that male and female respondents in each proficiency group used the same learning strategies. However, as far as individual direct and indirect sub-strategies are concerned, two significant differences were found: (i) male and female proficient readers used compensative strategies differentially, with females using these strategies more frequently; The same also held for less proficient readers, but in this case, it was the male group that used these strategies more frequently; and (ii) only in the case of proficient readers did male readers use affective strategies more frequently.

Keywords: English for Medical Purposes, Learning Strategies, ESP, Language Strategies, SILL.

INTRODUCTION

Perhaps English for Specific Purposes (ESP) is one of the major activities around the world today. Over the past 30 years or so, besides the English-speaking countries, in many other countries English has been the major language for higher education. Research related to ESP has addressed questions and problems from a variety of perspectives including research on individual skills, language components, learner characteristics, and so on. In Iranian context, too, some ESP researchers have addressed questions on the effects on ESP development of such variables as text familiarity, genre awareness, etc. To date, however, no research in Iran has addressed ESP readers' gender in relation to learning strategies. This study aims at showing if there is any significant difference between male and female readers of medical texts in terms of using learning strategies. Male and female readers will be compared in both less proficient and proficient groups.

1. Background

No doubt there are many factors that affect strategy use by EFL/ESL students (Griffits, 2005). Strategy instruction usually begins with assessing learners' strategy use which serves many purposes. Identifying learning strategies is a means of applying the learner centered approach to language learning, because it can be a prerequisite to learner training (Kouraogo, 1993). Studying strategies used by learners provides teachers with the opportunity to know about how they perform tasks and process new input (Hismanoglu, 2000). When responding to measures such as a strategy scale, learners find out a lot about themselves as learners (Oxford and Burry-Stock, 1995).

Teaching language learning strategies (LLSs) is beneficial to both the teacher and the learner. Strategy instruction improves not the learning product, but the process because it enhances learners' awareness of how to learn successfully and motivates them (Rasekh and Ranjbari, 2003). It helps teachers to become more aware of their

learners' needs and of how their teaching styles are appropriate to their learners' strategies, and to direct teachers in their teaching efforts (Kinoshita, 2003). Studies in the field of language learning and teaching have shown how important language learning strategies (LLSs) are. These research findings seem to imply that EFL teachers should help less successful language learners to employ the LLSs used by their successful peers. There is a claim that LLSs are not 'innate' but are 'learnable' (Oxford, 1994).

Although most of the researchers who work in the field of language learning believe that strategies help learners to solve their problems for lifelong in language, they have not always been in agreement about the definition of strategy in language learning. Strategy, from the ancient Greek term 'strategia', refers to generalship or the art of war (Chang, 2007). However, in language, the definition of strategy is completely different. It seems that the definition by Rubin (1975) has been the first definition of strategies in language. Rubin defined strategies as "the techniques or devices, which a learner may use to acquire knowledge" (p. 43). In Stern's (1983) point of view, strategy is best reserved for general tendencies or overall characteristics of the approach employed by the language learner, leaving technique as the term to refer to particular forms of observable learning behaviors. Another definition is the one proposed by Schemeck (1988): "the implementation of a set of procedures (tactics) for accomplishing something" (p. 5). Oxford (1990) believed that strategies are tools in language learning "because they are tools for active, self-directed involvement, which is essential for developing communicative competence" (p. 1). Ellis (1994) mentions that the term strategy in language learning stands for a "mental or behavioral activity related to some specific stage in the overall process of language acquisition or language use" (P. 529).

In general, language learning strategy (LLS) is a specific step or action taken by the learner to facilitate acquisition, retention, retrieval and performance (Rigney, 1978); they make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations (Oxford, 1990). They involve the mental and communicative procedures learners use in order to learn and use language (Nunan, 1991). Rubin indicated that "language learning strategies are strategies which contribute to the development of the language system which the learner constructs and affects learning directly" (Rubin, 1987, p. 23). Bialystok (1982) defined language learning strategies as "optional means for exploiting available information to improve competence in a second language" (p. 71). Meanwhile, Bialystok identified four kinds of language learning strategies: (i) formal practicing, (ii) functional practicing, (iii) monitoring, and (iv) inferencing. O'Malley and Chamot (1987) defined language learning strategies as "techniques, approaches or deliberate actions that students take in order to facilitate the learning and recall of both linguistic and content area information" (p. 71). She stated that some language learning strategies are observable, but some may not be observable. Later, another definition for language learning strategies was offered: "the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (O'Malley and Chamot, 1990, p. 1).

Several researchers have tried in the past few decades to provide detailed taxonomies for language learning strategies. An early attempt was made by O'Malley and Chamot (1987) who classified LLSs into three groups:

- metacognitive strategies, like directed attention, self-management and self-evaluation;
- cognitive strategies, e.g., repetition, note-taking and deduction; and
- social/affective strategies, like question for clarification and co-operation.

Later, Stern (1990) classified LLSs into four major classes: (i) Management and Planning Strategies, (ii) Affective Strategies, (iii) Interpersonal strategies, and (iv) Cognitive strategies. Perhaps the most comprehensive and detailed taxonomy was proposed by Oxford (1990) who classified LLSs into two major classes: (I) Direct, and (ii) Indirect strategies.

These classes include six sub-strategies:

- *Cognitive strategies*: processing information and structuring it; e.g., analyzing, summarizing.
- *Memory (mnemonic) strategies*: remembering information via making connections between it; e.g., grouping, using keywords.
- *Metacognitive strategies*: managing the learning process and dealing with the task; e.g., planning, identifying and selecting resources.
- *Compensation strategies*: compensating for knowledge gap; e.g., guessing, gesturing.
- *Affective strategies*: identifying one's affective traits and knowing how to manage them; e.g., reducing anxiety, encouraging one's self.
- *Social strategies*: learning from or/and with the others; e.g., asking for cooperation, working with peers.

From their introduction in the late 1980s and early 1990s, LLSs have spurred interest in researchers. Many researchers who worked on factors which affect language learning strategies believe that some factors are more important. In their opinions, these factors are the level of language proficiency, gender, age, motivation, cultural background, socioeconomic status, learning duration, and the language being learned. For purposes of the present study, two factors are examined in relation to LLSs: medical readers' proficiency and their gender.

2. Method

This study aimed to diagnose the differences in the use of language learning strategies among different medical members in reading medical texts; it aimed to:

- Investigate the difference between proficient and less proficient medical readers' use of learning strategies;
- Investigate the difference between male and female medical readers' use of learning strategies

2.1 Participants

For this study, 120 participants were randomly selected. 60 participants were professors in medicine; they were professionals who had spent well over ten years of their lives in their profession, and who had read most of the content of the courses they have studied and taught in English. They also asserted to have passed standard language proficiency tests that are required for entry into their profession. As such, they were taken, in this study, to be proficient readers of medical texts. 30 professors were males, and remaining 30 were females. 60 other participants in this study were medical students who were spending their hospital training; they were students from the 3rd through the 7th years of medicine (referred to in Iran as internists); these participants were taken to be less proficient readers of medical texts due to the shorter period of time they had spent receiving education in medicine. 30 of them were males, and 30 were females. Table 1 displays the characteristics and frequency of the participants in this study

All participants were from Azad Medical University of Mashhad branch. According to the Iranian system of Medical training, the less proficient participants were in clinical training (i.e., between the years of 4-7); medical training in Iran divides in two stages: (i) theoretical and (ii) clinical training. In the first three years of education in medicine (i.e., the theoretical stage) students study some basic concepts in medicine like biochemistry, biology and physiology; in the next 4 years they study more about patients, drugs, and differential diagnosis. Because of the lack of sufficient medical sources in Persian, English is the language of the main sources in clinical training stage and beyond.

2.2 Instrumentation

For this research, Oxford's (1990) Strategy Inventory for Language Learning (SILL) was used. The SILL questionnaire was used because it has been applied extensively as a reliable tool for years by many researchers in language. The SILL is a self-scoring survey. It has several versions for learners who learn English as a second language as well as those who learn other languages. Chang (2007) stated that the SILL was first designed at the Defense Language Institute (DLI) in Monterey, California. Actually, it was

	Male		Female		
	Proficient	Less proficient	Proficient	Less proficient	Total
Frequency	30	30	30	30	120
	45-55	23-25	45-55	23-25	

Table 1. Characteristics and Frequency of the Participants in the Study

designed to assess the frequency of the use of language learning strategies by students at this institute. Today, two versions of the SILL exist. One of them includes 80 items for foreign language learners whose first language is English; the other was developed for learners of English as a second or foreign language (ESL/EFL). This latter version includes 50 items. Until now, the SILL questionnaire has been used in several studies and in a dozen dissertations and theses. Within the last 10 to 15 years, the SILL appeared to be the only language learning strategy instrument that has been extensively checked for reliability and that has been validated in multiple ways (Oxford and Burry-Stock, 1995).

In this study, the version 7.0 of the SILL with 50 items was employed to collect data for testing the null hypotheses of the study. These 50 items fall into two main categories: (i) direct strategies (including memory, cognitive, and compensation strategies) and (ii) indirect strategies (including metacognitive, affective, and social strategies. As for direct strategies, items 1 to 9 measure memory strategies, items 10 to 23 measure cognitive strategies, and items 24 to 29 compensation strategies. On the other hand, the indirect strategies are measured by items 30 through 50 with items 30 to 38 measuring metacognitive strategies, items 39 to 44 measuring affective strategies, and items 45 to 50 measuring social strategies.

These strategies support different language learning and use abilities. First, memory strategies involve the storing and retrieval of information. Cognitive strategies, on the other hand, are described by Oxford (1990) as being "a varied lot, ranging from repeating to analyzing expressions to summarizing", although they are "unified by a common function: manipulation or transformation of the target language by the learner" (p.43). Moreover, compensation strategies "enable learners to use the new language for either comprehension or production despite limitations in knowledge" (ibid). As an indirect strategy, metacognitive strategies "allow learners to control their own cognition" (p. 135). By way of contrast, affective strategies can be the regulation of feelings and attitudes. Finally, social strategies are close to the fact that language is a form of social behavior, involving communication with other people.

Each item in this version of the SILL questionnaire employs a five-point likert scale (with responses ranging from 1 to 5), and it takes about 25-30 minutes for the respondents to complete the questionnaire. The Likert values represent how often the learner uses the given strategy. Number 1 shows that the strategy is generally not used (i.e., not true for the respondent). Number 2 means never or almost never true. Somewhat true is indicated by number 3. Number 4 stands for generally true. Finally, number 5 indicates that the strategy is always or almost always true for the respondent. In general, the ESL/EFL SILL reliabilities have been high enough (Chang, 2007). In studies worldwide, the SILL's reliability using Cronbach's alpha is ordinarily in the range of the .90s (Oxford and Ehrman, 1995).

3.3 Procedure

All of the participants in this study took the SILL questionnaire in one administration. The researcher was present to give the respondents the guidelines they needed for completing the questionnaire and to resolve any probable misunderstanding. The researcher distributed the questionnaire, explained about the SILL questionnaire, the goal of the study, and at the end collected the filled questionnaires. During the filling of the questionnaire, all participants could ask any questions they had about the items of the SILL. This administration took 30 minutes. After the administration of the SILL, the participants' responses were input into the Statistical Package for Social Sciences (SPSS) software as the raw data for the study. The data were then processed and made ready for analysis.

Until now, the SILL test has been used in three different ways (Ghadessy, 1998). One possibility is to have the participants' respond to each of the 50 items; their responses are then totaled, scaled, and compared within and across groups. Another possibility is to tally participants' responses to each of the 6 categories, to average them, and then to compare them. A last possibility is to score participants' responses to each of the 50 items individually and then compare the results. For

purposes of this study, the first method was used. In order to minimize possible error because of participants' varying levels of English comprehension, the SILL questionnaire was translated into Persian and used in this research.

The sum total of the scores for all the items gave the researcher a set of scores for total strategy use. Moreover, all of the items for direct strategies were summed and the result was recorded as direct strategy use scores. The researcher did the same for items that measure indirect strategies to arrive at the respondents' indirect strategy use scores. As for memory strategies, respondents' answers to items 1 to 9 were totaled and the result was recorded as memory strategy score; items 10 to 23 were totaled to afford a set of scores for cognitive strategies; the same procedure was repeated with corresponding items to obtain sets of scores for compensation, metacognitive, affective, and social strategies. These were, of course, raw scores. To meet the assumptions of the statistic to be used in data analysis, all of these score sets were scaled in such a way as to make them comparable on a scale of 100. This means that all score sets were scaled to have been obtained out of 100.

To analyze the data, several independent samples t-tests were performed. This was done because the grouping variables of the study (i.e., gender and proficiency level) did not have more than two sub-levels. Moreover, the scores obtained through the administration of the SILL had an interval scale. Finally, the participants in each group were not the same individuals who participated in any of the other groups. As such, the best statistic for the analysis of the data in the current study was the independent samples t-test statistic. Mean scores for male and female as well as proficient and less proficient participants were compared.

4. Results

One of the aims of the current study was to see if there was a significant difference between male and female medical readers (regardless of their proficiency level) in terms of language-learning-strategy use. To this end, strategy scores for all of the male and female participants were totaled and submitted to an independent samples t-test. This was done to compare total strategy scores for males and females.

There was no significant difference in scores for males (M=60.71, SD=12.86), and females [M=62.35, SD=11.2; t(118)=-.742, p=.459]. The magnitude of the difference in the means was very small (eta squared = .004); this claim is made based on the index proposed by Cohen (1988) who identified eta 2=.01 as indicating small effect, eta2=.06 for moderate effect, and eta 2=.14 for large effect. Only .4% of the variance was accounted for by language learning strategies (see Cohen, 1988). Tables 2 and 3 display the results for this analysis.

In the comparisons above, all males from both proficient and less proficient groups were compared to all females. It was more interesting to see if males in one proficiency group differed from females in the same proficiency groups. To this end, a couple of independent samples t-tests were performed. Results indicated no significant difference. Tables 4 and 5 display the findings for less proficient [Males (M=61.58, SD=11.46), and females (M=58.83, SD=10.14; t(58)=.985, p=.329, eta 2=.016,

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	60	60.7157	12.86069	1.66031
Female	60	62.3503	11.20391	1.44642

Table 2. Group Statistics for Strategy Use Across Gender

Levene's Test		t-test				
F	Sig.	t	df	Sig.(2-tailed)	Eta^2	σ%
.971	.326	-.742	118	.459	.004	.4%

Table 3. Independent Samples t-Test for Strategy Use Across Gender

	Gender	N	Mean	Std.Deviation	Std.Error Mean
Less Proficient	Male	30	61.5895	11.46979	2.09409
	Female	30	58.8363	10.14384	1.85200
Proficient	Male	30	59.8418	14.26052	2.60360
	Female	30	65.8643	11.26671	2.05701

Table 4. Group Statistics for Readers' Strategy Use Across Gender

	Levene's Test		t-test				
	F	Sig.	t	df	Sig.(2-tailed)	Eta^2	σ%
Less Proficient	.345	.559	.985	58	.329	.016	1.6%
Proficient	1.250	.268	-1.815	58	.075	0.053	5.3%

Table 5. Independent Samples t-Test for Readers' Strategy Use Across Gender

variance percentage=1.6%], and proficient readers [Males (M=59.84, SD=14.26), and females (M=65.86, SD=11.26; t(58)=-1.815, p=.075, eta2=.053, variance percentage=5.3%].

Another aim of the study was to see if there was a significant difference between proficient and less proficient medical readers (regardless of their gender) in terms of language-learning-strategy use. To this end, another independent samples t-test was conducted. This was done to compare total strategy scores for proficient and less proficient medical readers. No significant difference was found in scores for less proficient readers (M=60.21, SD=10.82), and proficient ones [M=62.85, SD=13.09; t(118)=-1.204, p=.231]. The magnitude of the difference in the means was very small (eta 2= .012); only 1.2% of the variance was accounted for by language learning strategies. Tables 6 and 7 display the results for this analysis.

It was stated earlier in the background section (above) that learning strategies are both direct and indirect. As such, another aim of the study was to see if there was a significant difference between male and female medical readers in terms of direct language-learning-strategy use. To this end, another independent samples t-test was conducted. This was done to compare direct strategy scores for male and female medical readers—again regardless of their proficiency levels. No significant difference was found in scores for male (M=60.03, SD=13.29), and female ones [M=61.16, SD=10.02; t(118)=-.524, p=.601]. The magnitude of the difference in the means was extremely small (eta2= .002); only .2% of the variance was accounted for by direct language learning strategies. Tables 8 and 9 display the results for this analysis.

Gender	N	Mean	Std.Deviation	Std.Error Mean
Less Proficient	60	60.2129	10.82437	1.39742
Proficient	60	62.8530	13.09857	1.69102

Table 6. Group Statistics for Strategy Use Across Proficiency Groups

Levene's Test		t-test				
F	Sig.	t	df	Sig.(2-tailed)	Eta^2	σ%
2.219	.139	-1.204	118	.231	.012	1.2%

Table 7. Independent Samples t-Test for Strategy Use Across Proficiency Groups

Gender	N	Mean	Std.Deviation	Std.Error Mean
Male	60	60.0345	13.29033	1.71577
Female	60	61.1609	10.02505	1.29423

Table 8. Group Statistics for Direct Strategy Use Across Gender Categories

Levene's Test		t-test				
F	Sig.	t	df	.Sig (2-tailed)	Eta^2	σ%
2.515	.115	-.524	118	.601	.002	.2%

Table 9. Independent Samples t-Test for Direct Strategy Use Across Gender Categories

Here again, it was more interesting to see if males in one proficiency group differed from females in the same proficiency groups. To this end, several independent samples t-tests were performed. Results indicated no significant difference. Tables 10 and 11 display the findings for less proficient [Males (M=61.65, SD=11.22), and females (M=58.27, SD=9.34; t(58)=1.267, p=.21, eta2=.041, variance percentage=4.1%] and proficient readers [Males (M=58.41, SD=15.09), and females (M=64.04, SD=9.99; t(58)=-1.704, p=.094, eta2=.047, variance percentage=4.7%].

Individual direct strategies were also compared. No significant difference was found in memory strategy scores for male readers (M=54.85, SD=12.96), and female ones [M=55.77, SD=10.59; t(118)=-.428, p=.669]. The magnitude of the difference in the means was extremely small (eta2= .001); only .1% of the variance was accounted for by memory strategies. Nor was there a significant difference in mean scores for cognitive strategies. Male statistics (M=59.92, SD=17.97),

	Gender	N	Mean	Std. Deviation	Std.Error Mean
Less Proficient	Male	30	61.6552	11.22107	2.04868
	Female	30	58.2759	9.34573	1.70629
Proficient	Male	30	58.4138	15.09998	2.75687
	Female	30	64.0460	9.99526	1.82488

Table 10. Group Statistics for Readers' Direct Strategy Use Across Gender

	Levene's Test		t-test				
	F	Sig.	t	df	Sig. (2-tailed)	Eta^2	σ%
Less Proficient	.838	.364	1.267	58	.210	.041	4.1%
Proficient	2.524	.118	-1.704	58	.094	.047	4.7%

Table 11. Independent Samples t-Test for Readers' Direct Strategy Use Across Gender

compared to female statistics (M=61.04, SD=13.53) revealed no difference [t(118)=-.385, p=.701]. The magnitude of the difference in the means was extremely small (eta2= .001); only .1% of the variance was accounted for by cognitive strategies. A last direct sub-strategy, i.e., compensation strategy, was no an exception. [Males (M=68.05, SD=16.60), females [M=69.50, SD=14.70; t(118)=-.504, p=.615]. The magnitude of the difference in the means was extremely small (eta2= .002); only .2% of the variance was accounted for by compensation strategies. Tables 12 and 13 display the results for this analysis.

Here again, it was more interesting to see if males in one proficiency group differed from females in the same proficiency groups. To this end, several independent samples t-tests were performed. Results indicated that except in the case of compensation strategies in the less proficient, there was no significant difference for any of the other strategies. The size of the effect for the compensation strategy was medium. 6.7% of the observed variance in the use of this strategy could be explained by a difference in gender. Tables 14 and 15 display the findings for less proficient readers:

Memory: [Males (M=54.59, SD=11.98), and females (M=54.96, SD=11.47; t(58)=-.122, p=.903, eta 2=.00, variance percentage=0%]

Cognitive: [Males (M=61.80, SD=14.74), and females (M=57.95, SD=11.25; t(58)=1.139, p=.259, eta 2=.021, variance percentage=2.1%]

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Memory Strategy	Male	60	54.8519	12.96085	1.67324
	Female	60	55.7778	10.59597	1.36793
Cognitive Strategy	Male	60	59.9286	17.97886	2.32106
	Female	60	61.0476	13.53184	1.74695
Compensation Strategy	Male	60	68.0556	16.60771	2.14405
	Female	60	69.5000	14.70136	1.89794

Table 12. Group Statistics for Different Direct Strategies Across Gender Categories

	Levene's Test		t-test				
	F	Sig.	t	df	Sig. (2-tailed)	Eta^2	σ%
Memory Strategy	2.831	.095	-.428	118	.669	.001	.1%
Cognitive Strategy	1.729	.191	-.385	118	.701	.001	.1%
Compensation Strategy	.126	.724	-.504	118	.615	.002	.2%

Table 13. Independent Samples t-Test for Different Direct Strategies Across Gender Categories

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Memory Strategy	Male	30	54.5926	11.98386	2.18794
	Female	30	54.9630	11.47946	2.09585
Cognitive Strategy	Male	30	61.8095	14.74118	2.69136
	Female	30	57.9524	11.25911	2.05562
Compensation Strategy	Male	30	71.8889	14.13355	2.58042
	Female	30	64.0000	15.54625	2.83834

Table 14. Group Statistics for Less Proficient Readers' Use of Different Direct Strategies Across Gender

	Levene's F	Test Sig.	t-test t	df	Sig. (2-tailed)	Eta^2	σ%
Memory Strategy	.034	.855	-.122	58	.903	.00	0%
Cognitive Strategy	1.240	.270	1.139	58	.259	.021	2.1%
Compensation Strategy	1.987	.164	2.057	58	.044*	.067	6.7%

Table 15. Independent Samples t-Test for Less Proficient Readers' Use of Different Direct Strategies Across Gender

Compensation: [Males (M=71.88, SD=14.13), and females (M=64.00, SD=15.54; t(58)=2.057, p=.044, eta 2=.067, variance percentage=6.7%]

The same analysis was conducted for proficient readers. Here again, no significant difference was found except for compensation strategy. The size of the effect for the compensation strategy was medium. 11.4% of the observed variance in the use of this strategy could be explained by a difference in gender. Tables 16 and 17 display the results of this analysis.

Memory: [Males (M=55.11, SD=14.07), and females (M=56.59, SD=9.76; t(58)=-.474, p=.638, eta 2=.003, variance percentage=.3%]

Cognitive: [Males (M=58.04, SD=20.8), and females (M=64.14, SD=15.03; t(58)=-1.301, p=.199, eta 2=.028, variance percentage=2.8%]

Compensation: [Males (M=64.22, SD=18.19), and females (M=75.00, SD=11.63; t(58)=-2.733, p=.008, eta 2=.114, variance percentage=11.4%]

Another aim of the study was to see if there was a significant difference between proficient and less proficient medical readers in terms of direct language-learning-strategy use. To this end, another independent samples t-test was conducted. This was done to compare

	Gender	N	Mean	Std. Deviation	Std.Error Mean
Memory Strategy	Male	30	55.1111	14.07152	2.56910
	Female	30	56.5926	9.76058	1.78203
Cognitive Strategy	Male	30	58.0476	20.80871	3.79913
	Female	30	64.1429	15.03152	2.74437
Compensation Strategy	Male	30	64.2222	18.19295	3.32156
	Female	30	75.0000	11.63790	2.12478

Table 16. Group Statistics for Proficient Readers' Use of Different Direct Strategies Across Gender

	Levene's F	Test Sig.	t-test t	df	Sig. (2-tailed)	Eta^2	σ%
Memory Strategy	5.246	.026	-.474	58	.638	.003	.3%
Cognitive Strategy	1.018	.317	-1.301	58	.199	.028	2.8%
Compensation Strategy	3.738	.058	-2.733	58	.008*	.114	11.4%

Table 17. Independent Samples t-Test for Proficient Readers' Use of Different Direct Strategies Across Gender

direct strategy scores for less proficient and proficient medical readers. No significant difference was found in scores for less proficient (M=59.96, SD=10.37), and proficient ones [M=61.22, SD=13.00; t(118)=-.588, p=.557]. The magnitude of the difference in the means was extremely small (eta2= .002); only .2% of the variance was accounted for by direct language learning strategies. Tables 18 and 19 display the results for this analysis.

Individual direct strategies were also compared. No significant difference was found in memory strategy scores for less proficient (M=54.77, SD=11.63), and proficient ones [M=55.85, SD=12.02; t(118)=-.497, p=.620]. The magnitude of the difference in the means was extremely small (eta 2= .002); only .2% of the variance was accounted for by memory strategies. Nor was there a significant difference in mean scores for cognitive strategies. Less proficient statistics (M=59.88, SD=13.14), compared to proficient statistics (M=61.09, SD=18.25) revealed no difference [t(118)=-.418, p=.677]. The magnitude of the difference in the means was extremely small (eta2= .001); only .1% of the variance was accounted for by cognitive strategies. A last direct sub-strategy, i.e., compensation strategy, was no exception. [Less proficient (M=67.94, SD=15.25), proficient [M=69.61, SD=16.08; t(118)=-.582, p=.561]. The magnitude of the difference in the means was extremely small (eta2= .002); only .2% of the variance was accounted for by compensation strategies. Tables 20 and 21 display the results for this analysis.

Gender	N	Mean	Std.Deviation	Std.Error Mean
Less Proficient	60	59.9655	10.37900	1.33992
Proficient	60	61.2299	13.00935	1.67950

Table 18. Group Statistics for Direct Strategy Use Across Proficiency Groups

Levene's	Test	t-test				
F	Sig.	t	df	Sig. (2-tailed)	Eta^2	σ%
1.703	.194	-.588	118	.557	.002	.2%

Table 19. Independent Samples t-Test for Direct Strategy Use Across Proficiency Groups

Still another aim of the study was to see if there was a significant difference between male and female medical readers (regardless of their proficiency level) in terms of indirect language-learning-strategy use. To this end, another independent samples t-test was conducted. This was done to compare indirect strategy scores for male and female medical readers. No significant difference was found in scores for male (M=61.39, SD=14.83), and female ones [M=63.53, SD=14.48; t(118)=-.800, p=.425]. The magnitude of the difference in the means was small (eta2= .005); only .5% of the variance was accounted for by indirect language learning strategies. Tables 22 and 23 display the results for this analysis.

Here again, it was more interesting to see if males in one

	Proficiency	N	Mean	Std.Deviation	Std. Error Mean
Memory Strategy	Less Proficient	60	54.7778	11.63600	1.50220
	Proficient	60	55.8519	12.02958	1.55301
Cognitive Strategy	Less Proficient	60	59.8810	13.14920	1.69755
	Proficient	60	61.0952	18.25748	2.35703
Compensation Strategy	Less Proficient	60	67.9444	15.25788	1.96978
	Proficient	60	69.6111	16.08700	2.07682

Table 20. Group Statistics for Different Direct Strategies Used Across Proficiency Groups

	Levene's Test F	Sig.	t-test t	df	Sig. (2-tailed)	Eta^2	σ%
Memory Strategy	.389	.534	-.497	118	.620	.002	.2%
Cognitive Strategy	4.911	.029	-.418	118	.677	.001	.1%
Compensation Strategy	.012	.912	-.582	118	.561	.002	.2%

Table 21. Independent Samples t-Test for Different Direct Strategies Used Across Proficiency Groups

Gender	N	Mean	Std. Deviation	Std.Error Mean
Male	60	61.3968	14.83886	1.91569
Female	60	63.5397	14.48618	1.87016

Table 22. Group Statistics for Indirect Strategy Use Across Gender Categories

Levene's	Test	t-test				
F	Sig.	t	df	Sig. (tailed)	Eta^2	σ%
.229	.633	-.800	118	.425	.005	.5%

Table 23. Independent Samples t-Test for Indirect Strategy Use Across Gender Categories

proficiency group differed from females in the same proficiency groups. To this end, several independent samples t-tests were performed. Results indicated no significant difference. Tables 24 and 25 display the findings for less proficient [Males (M=61.52, SD=14.45), and females (M=59.39, SD=12.86; t(58)=.602, p=.550, eta2=.006, variance percentage =.6%] and proficient readers [Males (M=61.26, SD=15.45), and females (M=67.85, SD=15.02; t(58)=-1.629, p=.109, eta2=.043, variance percentage=4.3%].

Individual indirect strategies were also compared. No significant difference was found in metacognitive strategy scores for male (M=67.11, SD=18.01), and female ones [M=70.22, SD=16.64; t(118)=-.983, p=.328]. The magnitude of the difference in the means was small (eta2= .008); only .8% of the variance was accounted for by metacognitive strategies. Nor was there a significant difference in mean scores for affective strategies. Male statistics (M=51.27, SD=14.73), compared to female statistics (M=55.72, SD=16.30) revealed no difference [t(118)=-1.567, p=.120]. The magnitude of the difference in the means was small (eta2= .02); only 2% of the variance was accounted for by affective strategies. A last direct sub-strategy, i.e., social strategy, was not an exception. [Males (M=62.94, SD=16.96), females [M=61.33, SD=16.96; t(118)=-.520, p=.604]. The magnitude of the difference in the means was extremely small (eta2= .002); only .2% of the variance was accounted for by social strategies. Tables 26 and 27 display the results for this analysis.

Here again, it was more interesting to see if males in one proficiency group differed from females in the same proficiency groups. To this end, several independent samples t-tests were performed. Results indicated that except in the case of affective strategies in the proficient group, there was no significant difference for any of the other strategies. Tables 28 and 29 display the findings for less proficient readers:

Metacognitive: [Males (M=67.40, SD=18.36), and females (M=64.88, SD=14.61; t(58)=.588, p=.559, eta2=.005, variance percentage=.5%]

Affective: [Males (M=52.00, SD=14.39), and females (M=50.77, SD=13.17; t(58)=.343, p=.733, eta2=.002, variance percentage=.2%]

Social: [Males (M=62.22, SD=16.66), and females (M=59.77, SD=16.76; t(58)=.566, p=.573, eta2=.005, variance percentage=.5%]

	Gender	N	Mean	Std.Deviation	Std. Error Mean
Less Proficient	Male	30	61.5238	14.45786	2.63963
	Female	30	59.3968	12.86653	2.34910
Proficient	Male	30	61.2698	15.45683	2.82202
	Female	30	67.6825	15.02922	2.74395

Table 24. Group Statistics for Readers' Indirect Strategy Use Across Gender

	Levene's	Test	t-test				
	F	Sig.	't'	df	Sig.(2-tailed)	Eta^2	σ%
Less Proficient	.911	.344	.602	58	.550	.006	.6%
Proficient	.002	.963	-1.629	58	.109	.043	4.3%

Table 25. Independent Samples t-Test for Readers' Indirect Strategy Use Across Gender

	Gender	N	Mean	Std. Deviation	Std.Error Mean
Metacognitive Strategy	Male	60	67.1111	18.01536	2.32577
	Female	60	70.2222	16.64066	2.14830
Affective Strategy	Male	60	51.2778	14.73037	1.90168
	Female	60	55.7222	16.30791	2.10534
Social Strategy	Male	60	62.9444	16.96448	2.19010
	Female	60	61.3333	16.96568	2.19026

Table 26. Group Statistics for Different Indirect Strategies Used Across Gender Categories

	Levene's	Test	t-test				
	F	Sig.	't'	df	Sig.(2-tailed)	Eta^2	σ%
Metacogn tive Strategy	1.056	.306	-.983	118	.328	.008	.8%
Affective Strategy	.668	.415	-1.567	118	.120	.02	2%
Social Strategy	.003	.954	.520	118	.604	.002	.2%

Table 27. Independent Samples t-Test for Different Indirect Strategies Used Across Gender Categories

The same analysis was conducted for proficient readers. As for the proficient group, a significant difference was observed for affective strategies. The size of the effect for this difference was medium. 8.7% of the observed variance in the use of this strategy could be explained by a difference in gender. Tables 30 and 31 display the results of this analysis.

Metacognitive: [Males (M=66.81, SD=17.96), and females (M=75.55, SD=17.05; t(58)=-1.933, p=.058, eta2=.06, variance percentage=6%]

Affective: [Males (M=50.55, SD=15.26), and females (M=60.66, SD=17.79; t(58)=-2.362, p=.022, eta2=.087, variance percentage=8.7%]

Social: [Males (M=63.66, SD=17.51), and females (M=62.88, SD=17.30; t(58)=.173, p=.863, eta2=.005, variance percentage=.5%]

Another aim of the study was to see if there was a significant difference between proficient and less proficient medical readers in terms of indirect language-learning-strategy use. To this end, another independent samples t-test was conducted. This was done to compare indirect strategy scores for less proficient and proficient medical readers. No significant difference was found in scores for less proficient (M=60.46, SD=13.61), and proficient ones [M=64.47, SD=15.45; t(118)=-1.51, p=.134].

The magnitude of the difference in the means was small (eta2= .01); only 1% of the variance was accounted for by indirect language learning strategies. Tables 32 and 33 display the results for this analysis.

Individual indirect strategies were also compared. No significant difference was found in metacognitive strategy scores for less proficient (M=66.14, SD=16.50), and proficient ones [M=71.18, SD=17.91; t(118)=-1.602, p=.112]. The magnitude of the difference in the means was small (eta2= . 02); only 2% of the variance was accounted for by metacognitive strategies. Nor was there a significant difference in mean scores for affective strategies. Less proficient statistics (M=51.38, SD=13.69), compared to proficient statistics (M=55.61, SD=17.21) revealed no difference [t(118)=-1.487, p=.140]. The magnitude of the difference in the means was small (eta2= .018); only 1.8% of the variance was accounted for by affective strategies. A last indirect sub-strategy, i.e.,

	Gender	N	Mean	Std.Deviation	Std.Error Mean
Metacognitive Strategy	Male	30	67.4074	18.36514	3.35300
	Female	30	64.8889	14.61759	2.66879
Affective Strategy	Male	30	52.0000	14.39987	2.62904
	Female	30	50.7778	13.17967	2.40627
Social Strategy	Male	30	62.2222	16.66283	3.04220
	Female	30	593.7778	16.76827	3.06145

Table 28. Group Statistics for Less Proficient Readers' Use of Different Indirect Strategies Across Gender

	Levene's	Test	t-test				
	F	Sig.	t	df	Sig. (2-tailed)	Eta^2	σ%
Metacognitive Strategy	1.949	.168	.588	58	.559	.005	.5%
Affective Strategy	.504	.481	.343	58	.733	.002	.2%
Social Strategy	.036	.851	.566	58	.573	.005	.5%

Table 29. Independent Samples t-Test for Less Proficient Readers' Use of Different Indirect Strategies Across Gender

	Gender	N	Mean	Std.Deviation	Std.Error Mean
Metacognitive Strategy	Male	30	66.8148	17.96770	3.28044
	Female	30	75.5556	17.05424	3.11366
Affective Strategy	Male	30	50.5556	15.26480	2.78696
	Female	30	60.6667	17.79836	3.24952
Social Strategy	Male	30	63.6667	17.51518	3.19782
	Female	30	62.8889	17.30354	3.15918

Table 30. Group Statistics for Proficient Readers' Use of Different Indirect Strategies Across Gender

	Levene's	Test	t-test				
	F	Sig.	t	df	Sig.(2-tailed)	Eta^2	σ%
Metacognitive Strategy	.110	.742	-1.933	58	.058	.06	6%
Affective Strategy	1.893	.174	-2.362	58	.022*	.087	8.7%
Social Strategy	.014	.907	.173	58	.863	.005	.5%

Table 31. Independent Samples t-Test for Proficient Readers' Use of Different Indirect Strategies Across Gender

Gender	N	Mean	Std. Deviation	Std. Error Mean
Less Proficient	60	60.4603	13.61119	1.75720
Proficient	60	64.4762	15.45676	1.99546

Table 32. Group Statistics for Indirect Strategy Use Across Proficiency Groups

Levene's	Test	t-test				
F	Sig.	t	df	Sig.(2- tailed)	Eta^2	%
.707	.402	-1.510	118	.134	.01	1%

Table 33. Independent Samples t-Test for Indirect Strategy Use Across Proficiency Groups

social strategy, was not an exception either. [Less proficient (M=61.00, SD=16.61), proficient [M=63.27, SD=17.26; t(118)=-.736, p=.463]. The magnitude of the difference in the means was small (eta2= .004); only .4% of the variance was accounted for by social strategies. Tables 34 and 35 display the results for this analysis.

5. Discussion

One aim of the present study was to find the difference between proficient and less proficient readers of medical texts in the use of learning strategies. The results of the corresponding independent samples t-test showed that this difference was not significant. Actually, both groups were nearly similar in the use of learning strategies. The rapid growth of interest in learning English among the new generation of physicians in Iran is most probably one of the reasons that can explain why the results turned out to be like this. The development of technology that has facilitated access to original English sources is perhaps another reason. Moreover, English is the language of science and the lingua franca of the majority of the countries in the world today. These, too, may have caused this similarity in behavior.

The participants in this research used a small number of affective strategies, but metacognitive strategies were used more frequently. Both groups used metacognitive strategies (centering the learning, arranging and planning the learning, evaluating the learning) more frequently, and affective strategies (lowering the anxiety, encouraging yourself, taking the emotional temperature) least frequently. These findings are different from the results of Pulitzer's (1983) research that reported that rote strategies (e.g., memorization) were the preferred strategies used by Asian students in contrast to Hispanic students. In the proficient group, a significant difference was observed between males and females in the use of affective strategies. Female professionals used affective strategies more frequently than their male counterparts. This can be accounted for on the basis of the commonly agreed-upon claim that women are more punctual, are more attentive to details, and are more organized in their activities.

	Proficiency	N	Mean	Std. Deviation	Std.Error Mean
Metacognitive Strategy	Less Proficient	60	66.1481	16.50514	2.13080
	Proficient	60	71.1852	17.91831	2.31324
Affective Strategy	Less Proficient	60	51.3889	13.69965	1.76862
	Proficient	60	55.6111	17.21134	2.22198
Social Strategy	Less Proficient	60	61.0000	16.61914	2.14552
	Proficient	60	63.2778	17.26597	2.22903

Table 34. Group Statistics for Different Indirect Strategies Used Across Proficiency Groups

	Levene's Test		t-test				
	F	Sig.	t	df	Sig. (2-tailed)	Eta^2	σ%
Metacognitive Strategy	1.215	.273	-1.602	118	.112	.02	2%
Affective Strategy	2.619	.108	-1.487	118	.140	.018	1.8%
Social Strategy	.159	.691	-.736	118	.463	.004	.4%

Table 35. Independent Samples t-Test for Different Indirect Strategies Used Across Proficiency Groups

It was also found that compensation strategies ranked the second in frequency among the strategies used by medical members. Compensation strategies involve strategies such as guessing intelligently and overcoming limitations in speaking and writing. For using these strategies, language learners need to have enough knowledge about the vocabulary of that field. In medicine, knowing the terminology of medicine is necessary for comprehension of medical texts. On the other hand, the medical terms are limited, and there is not a very high difference between proficient and less proficient readers since students receive extensive and intensive training in their ESP course on medical terminology. Therefore, the two groups in this study do not show any significant difference in connection to compensation strategies because they already know many vocabulary items and can guess the few unknown words from the reading context. The small greater mean obtained by proficient readers can be explained by the fact that greater proficiency creates a larger context for guessing the meanings of unknown words; hence, the positive mean difference on the part of medical professors. Within each group, however, significant differences were found between males and females in connection to compensation strategies. In the less proficient group males used compensation strategies more frequently than females while in the proficient group

females used compensation strategies more frequently than males.

From among the six strategies, affective strategies were the least frequent. Affective strategies, as mentioned earlier, involve strategies like lowering the anxiety and encouraging oneself. These strategies are often used more frequently by autonomous learners and make them motivated. The question here is: Why did the participants in this study use affective strategies less frequently? Perhaps, the answer should be traced back in the nature of medical texts; comprehension of such texts, medical professors contend, requires explanation from a person with a higher level specialization in that text. Actually, medical members in non-English-speaking countries depend more often on other members who are more proficient than themselves in reading and comprehending medical texts. Actually, difficulties in understanding medical texts written in English cause a lower level of self-confidence among medical students and, in turn, brings with it a lower frequency of affective-strategy use. This should not weaken the fact that a significant difference was observed between males and females in the proficient group in the use of this strategy with females using affective strategies more frequently than males.

Another subsidiary aim of the study was to investigate the difference between male and female medical students in the use of language learning strategies in reading medical texts. In the case of memory strategies, male students had a mean score somewhat smaller than female students; however, the difference was not significant. In the use of cognitive, metacognitive, compensative, affective, and social strategies, male students had a somewhat greater but not significant mean. These results run counter to the findings of studies like that of Green and Oxford (1995) which claimed that female students used more of learning strategies than male students did. The male mean scores in overall strategy use (except for memory strategies) were higher than female mean scores. As a whole, in this study, male students seem to be more commonly into using language learning strategies. Table 36 displays the mean scores for different direct and indirect strategies obtained by different subject groups in this study.

		Less Proficient		Proficient	
		Male	Female	Male	Female
Direct Strategies	Memory	54.59	< 54.96	55.11	< 56.59
	Cognitive	61.80	> 57.95	58.04	< 64.14
	Compensation	7188(*)	> 64.00(*)	64.22(*)	< 75.00(*)
Indirect Strategies	Metacognitive	67.40	> 64.88	66.81	< 75.55
	Affective	52.00	> 50.77	50.55(*)	< 60.66(*)
	Social	62.22	> 59.77	63.66	> 62.88

(*) Strategies for which the observed mean differences were statistically significant

Table 36. Mean Comparison for Strategy Use for Male and Female Students and Professors

Male and female proficient readers were also compared in terms of their use of language learning strategies. The result for the use of memory, cognitive, metacognitive, compensative, and affective strategies showed that female professionals had a higher mean in each case. In connection to social strategies, however, the results showed the opposite. In spite of the fact that these mean differences were observed, none was statistically significant. In overall strategy use, there was no statistically significant difference among the female professors and their male counterparts.

In brief, the results of this study suggested that both medical members of both sexes at a lower proficiency level used strategies in more or less the same way. However, as they gain more expertise and develop their knowledge of medical terminology, they start to use learning strategies more frequently. Gender comes into play at the professional level where female professionals use language learning strategies more frequently.

Conclusion

Based on the results of the study, it can be concluded that neither male and female proficient medical readers, nor their less proficient counterparts, differ in their overall use of language learning strategies. No significant differences in the use direct and indirect strategies by male and female proficient readers and their less proficient counterparts were found either. As far as individual direct and indirect sub-strategies are concerned, two significant differences were found: (I) male and female proficient

readers used compensative strategies differentially, with females using these strategies more frequently; The same also held for less proficient readers, but in this case, it was the male group that used these strategies more frequently; and (ii) only in the case of proficient readers did male readers use social strategies more frequently; the difference for this strategy was significant. Overall, male less-proficient readers used more strategies than did their female counterparts—except for memory strategies. However, proficient females used more strategies than did their male counterparts—with social strategies being the exception in this case. In brief, the results of this study suggested that medical members of both sexes at a lower proficiency level used strategies in more or less the same way. However, as they gain more expertise and develop their knowledge of medical terminology, they start to use learning strategies more frequently. Gender difference takes on a more important role at the professional level where female professionals use language learning strategies more frequently.

The major implication of this study for language teaching is that teachers need to know that their students' sex and level of proficiency affect their learning outcomes. Many researchers in the field of education believe that the most important teacher role in foreign language teaching is the provision of a range of tasks to match varied learning styles. The language teacher should be aware of whether his strategy training is implicit, explicit, or both. He should be reminded that questioning himself about what he plans to do before each lesson and evaluating his lesson plan in terms of strategy training are very important. Then, the teacher can get better prepared to focus on language learning strategies and strategy training during the process of his teaching. Teachers should learn about their students' behaviors, their interests, motivations, and learning styles.

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