

Chapter 4: The Quantitative Results for Questions 1 and 2

4.1. Introduction

This chapter reports the results of questions 1 and 2 in this study: quantitative results from the 23 cognitive and metacognitive reading strategies adopted from Chamot and O'Malley (1994) and the background including gender and proficiency level.

4.2. Results of Reading Strategy Questionnaire

As shown in Table 4.1, Iranian high school students had a mean (3.16) of strategy use on the 5-point Likert scale. Students' strategy use in this study was in the medium-use range. Students had a mean (3.32) of cognitive strategies and a mean (2.98) of metacognitive strategies.

The mean score for cognitive strategies was in the range of medium strategy use, and the mean score for metacognitive strategies was in the range of medium strategy use. Strategies in the cognitive category with a mean of 3.32 were more frequently used than strategies in the metacognitive category with a mean of 2.98. There is a difference in the mean scores of strategy use among the two categories. Thus for the Iranian students in this study, cognitive strategies were used more frequently than metacognitive strategies.

Table 4.1 Descriptive statistics for the overall use of reading strategy and strategy categories

Reading strategies	Number of items	Number of Subjects	Mean	Standard Deviation
Overall strategy use	23	300	3.16	1.26020
Cognitive strategies	11	300	3.32	1.29405
Metacognitive strategies	12	300	2.98	1.19721

As shown in Table 4.2, the most frequently used strategies are “while reading, I decide whether the information makes sense based on what I already know about the topic” (M=3.76, SD=1.16) and “I look for the organizational aspects of the text in terms of its typical structure (e.g. cause – effect, compare/contrast, etc.” (M=3.63, SD=1.29) which represent cognitive strategies.

The most important finding here is the metacognitive strategy often employed by the learners in the current study: “checking whether I understand the text or not”. It shows that learners intend to check their understanding of every detail in a text before proceeding to read the rest of it.

As shown in Table 4.2, cognitive strategies are used more frequently than metacognitive strategies. Within metacognitive strategies, monitoring strategies are used more frequently than planning strategies. Thus, planning strategies are not most frequently used. This study identified them as the least frequently used metacognitive strategies.

Table 4.2 Descriptive statistics on the most frequently cognitive and metacognitive reading strategy use

Cognitive Strategies	Mean	Std. Deviation
I decide whether the information makes sense based on what I already know about the topic. (Cognitive)	3.76	1.16
I look for logical relationships between paragraphs. (Cognitive)	3.56	1.17
I guess at unfamiliar vocabulary items through contextual clues. (Cognitive)	3.42	1.29
I summarize main ideas either orally or in written form. (Cognitive)	3.37	1.22
I read the text again to summarize its meaning. (Cognitive)	3.33	1.33
I connect what is read with what is already known. (Cognitive)	3.31	1.19
Metacognitive Strategies		
I look for relationships between main ideas (topic sentences) and details. (Metacognitive)	3.63	1.29
While I read, I periodically check whether the material is making sense to me. (Metacognitive)	3.54	1.10
I ask questions about the text. (Metacognitive)	3.26	1.17

In order to answer the second research question, several statistical methods such as independent t-tests were employed to analyze the data at hand. These t-tests were run to compare the mean scores of males and females in terms of 23 cognitive and metacognitive reading strategies. Different two-tailed significance t-tests with 298 degrees of freedom resulted in different two-tailed p values. As shown in Table 4.3, the p values are statistically insignificant because they are more than $\alpha = .05$ except for items 4 (cognitive; I anticipate possible content of the text), 21 (metacognitive; I reflect on how effectively a strategy was used), and 22 (metacognitive; I check whether I accomplished my goal for reading) because they are less than $\alpha = .05$. Our conclusion, then, is that there is no significant difference between males and females in terms of most of the cognitive and metacognitive strategies.

An independent t-test was run to compare the mean scores of males and females in terms of cognitive strategies. Different two-tailed significance t-tests with 298 degrees of freedom resulted in different two-tailed p values. The p values are statistically insignificant for all 15

cognitive strategies because they are more than $\alpha = .05$ except for item 4 (cognitive) as it is less than $\alpha = .05$. Here, we can conclude that there is no significant difference between males and females in terms of most of the cognitive strategies.

An independent t-test was also run to compare the mean scores of males and females in terms of metacognitive strategy use. The p values are statistically insignificant for all 12 metacognitive strategies because they are more than $\alpha = .05$ except for 21 (metacognitive) and 22 (metacognitive) because they are less than $\alpha = .05$. Our conclusion here is that there is no significant difference between males and females in terms of most metacognitive strategies. In conclusion, gender differences were not found in all 23 strategy items except for items 4, 21 and 22.

Table 4.3 Results of t-tests for Means of Strategies between Males (145) and Females (155)

Strategies	Gender	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Cognitive strategy 3	Male	145	3.18	1.13	1.237	298	.217
	Female	155	3.01	1.27		297.220	
Cognitive strategy 4	Male	145	3.11	1.27	2.135	298	.034
	Female	155	2.80	1.24		295.848	
Cognitive strategy 6	Male	145	2.97	1.38	1.896	298	.059
	Female	155	2.65	1.30		293.341	
Cognitive strategy 8	Male	145	3.82	1.14	.878	298	.381
	Female	155	3.70	1.17		297.577	
Cognitive strategy 9	Male	145	3.47	1.26	.883	298	.378
	Female	155	3.34	1.35		297.998	
Cognitive strategy 13	Male	145	3.33	1.16	.295	298	.768
	Female	155	3.29	1.21		297.809	
Cognitive strategy 14	Male	145	3.37	1.21	.033	298	.974
	Female	155	3.36	1.23		297.356	
Cognitive strategy 15	Male	145	3.68	1.10	1.806	298	.072
	Female	155	3.44	1.22		297.630	
Cognitive strategy 16	Male	145	3.36	1.36	-.706	298	.481
	Female	155	3.47	1.22		289.238	
Cognitive strategy 19	Male	145	3.18	1.33	1.814	298	.071
	Female	155	2.89	1.41		297.981	
Cognitive strategy 20	Male	145	3.46	1.24	1.623	298	.106
	Female	155	3.21	1.40		297.297	
Metacognitive strategy 1	Male	145	2.65	1.10	-.122	298	.903
	Female	155	2.67	1.14		297.775	
Metacognitive strategy 2	Male	145	2.86	1.11	1.123	298	.262
	Female	155	2.72	1.13		297.210	
Metacognitive strategy 5	Male	145	3.08	1.22	.129	298	.898
	Female	155	3.07	1.28		297.935	

Table 4.3 continued

Metacognitive strategy 7	Male	145	3.44	1.12	-1.445	298	.149
	Female	155	3.63	1.08		294.723	
Metacognitive strategy 10	Male	145	2.99	1.21	1.797	298	.073
	Female	155	2.74	1.14		293.139	
Metacognitive strategy 11	Male	145	3.33	1.22	1.108	298	.269
	Female	155	3.18	1.13		291.807	
Metacognitive strategy 12	Male	145	3.29	1.19	1.357	298	.176
	Female	155	3.10	1.18		296.343	
Metacognitive strategy 17	Male	145	2.82	1.14	.618	298	.537
	Female	155	2.74	1.06		292.006	
Metacognitive strategy 18	Male	145	3.00	1.21	-.219	298	.827
	Female	155	3.03	1.29		297.992	
Metacognitive strategy 21	Male	145	3.12	1.21	2.022	298	.044
	Female	155	2.85	1.12		291.866	
Metacognitive strategy 22	Male	145	2.99	1.20	2.006	298	.046
	Female	155	2.72	1.13		293.076	
Metacognitive strategy 23	Male	145	3.15	1.17	-.020	298	.984
	Female	155	3.16	1.17		296.650	

As shown in Table 4.4, gender showed a significant interaction effect with English proficiency, $F(1,260) = 5.56, p < .05$, where without a significant main effect, gender played an important role in the interaction effects on gender and English proficiency.

Table 4.4 Interaction effects on strategy use, gender, and language proficiency

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	83.953 ^a	39	2.153	1.910	.002	.223
Intercept	1152.567	1	1152.567	1022.603	.000	.797
Gender * English proficiency	6.270	1	6.270	5.563	.019	.021
Error	293.044	260	1.127			
Total	2505.000	300				
Corrected Total	376.997	299				

A series of independent t-tests were run to compare the mean scores of high and low-proficient students in terms of 23 cognitive and metacognitive reading strategies. Different two-tailed significance t-tests with 298 degrees of freedom resulted in different two-tailed p

values. As shown in Table 4.5, the p values are statistically significant because they are less than $\alpha = .05$ except for items 8 (Cognitive; I imagine scenes or draw pictures of what I am reading), 5 (Metacognitive; I decide in advance to look at the text to see its layout, illustrations, etc.), 18 (Metacognitive; I examine how well the text is understood), 21 (Metacognitive; I reflect on how effectively a strategy was used) because they are more than $\alpha = .05$. Thus, there is a significant difference between high and low-proficient students in terms of most cognitive and metacognitive strategies.

Meanwhile, an independent t-test was run to compare the mean scores of males and females in terms of cognitive strategies. Different two-tailed significance t-tests with 298 degrees of freedom resulted in different two-tailed p values. The p values are statistically significant for all 11 cognitive strategies because they are less than $\alpha = .05$ except for item 8 (Cognitive) because it is more than $\alpha = .05$. Our conclusion, then, is that there is a significant difference between high and low-proficient students in terms of most cognitive strategies.

An independent t-test was also run to compare the mean scores of high and low-proficient students in terms of metacognitive strategy use. The p values are statistically significant for all 12 metacognitive strategies because they are less than $\alpha = .05$ except for items 5 (Metacognitive), 18 (Metacognitive) and 21 (Metacognitive) because they are more than $\alpha = .05$. We can therefore conclude that there is a significant difference between high and low-proficient students in terms of most metacognitive strategies.

Table 4.5 T-test of reading strategy use for proficiency differences

Strategies	Proficiency level	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Cognitive Strategy 3	High proficient	184	3.30	1.20	3.818	298	.000
	Low proficient	116	2.76	1.15	3.850	2.51	.000
Cognitive Strategy 4	High proficient	184	3.14	1.28	3.227	298	.001
	Low proficient	116	2.66	1.18	3.286	2.59	.001
Cognitive Strategy 6	High proficient	184	3.01	1.31	3.573	298	.000
	Low proficient	116	2.45	1.33	3.559	2.41	.000
Cognitive Strategy 8	High proficient	184	3.83	1.13	1.321	298	.187
	Low proficient	116	3.65	1.20	1.304	2.33	.194
Cognitive Strategy 9	High proficient	184	3.54	1.22	2.384	298	.018
	Low proficient	116	3.18	1.41	2.306	2.18	.022
Cognitive Strategy 13	High proficient	184	3.46	1.12	2.919	298	.004
	Low proficient	116	3.06	1.25	2.848	2.25	.005
Cognitive Strategy 14	High proficient	184	3.54	1.20	3.239	298	.001
	Low proficient	116	3.08	1.20	3.238	2.44	.001
Cognitive Strategy 15	High proficient	184	3.68	1.14	2.268	298	.024
	Low proficient	116	3.37	1.19	2.246	2.37	.026
Cognitive Strategy 16	High proficient	184	3.60	1.26	3.236	298	.001
	Low proficient	116	3.12	1.28	3.223	2.41	.001
Cognitive Strategy 19	High proficient	184	3.16	1.37	2.086	298	.038
	Low proficient	116	2.82	1.38	2.082	2.43	.038
Cognitive Strategy 20	High proficient	184	3.52	1.29	3.130	298	.002
	Low proficient	116	3.03	1.34	3.102	2.37	.002
Metacognitive Strategy 1	High proficient	184	2.84	1.12	3.658	298	.000
	Low proficient	116	2.37	1.06	3.698	2.53	.000
Metacognitive Strategy 2	High proficient	184	2.96	1.13	3.423	298	.001
	Low proficient	116	2.51	1.07	3.462	2.53	.001
Metacognitive Strategy 5	High proficient	184	3.12	1.26	.781	298	.436
	Low proficient	116	3.00	1.24	.783	2.46	.434
Metacognitive Strategy 7	High proficient	184	3.65	1.03	2.274	298	.024
	Low proficient	116	3.36	1.18	2.202	2.19	.029
Metacognitive Strategy 10	High proficient	184	3.01	1.05	2.686	298	.008
	Low proficient	116	2.63	1.33	2.549	2.03	.012
Metacognitive Strategy 11	High proficient	184	3.40	1.14	2.761	298	.006
	Low proficient	116	3.02	1.19	2.734	2.36	.007
Metacognitive Strategy 12	High proficient	184	3.32	1.18	2.219	298	.027
	Low proficient	116	3.00	1.19	2.216	2.43	.028
Metacognitive Strategy 17	High proficient	184	2.93	1.11	3.106	298	.002
	Low proficient	116	2.53	1.03	3.163	2.58	.002
Metacognitive Strategy 18	High proficient	184	3.07	1.23	.917	298	.360
	Low proficient	116	2.93	1.28	.910	2.38	.364
Metacognitive Strategy 21	High proficient	184	3.07	1.15	1.732	298	.084
	Low proficient	116	2.83	1.19	1.718	2.38	.087
Metacognitive Strategy 22	High proficient	184	2.97	1.15	2.340	298	.020
	Low proficient	116	2.65	1.17	2.334	2.42	.020
Metacognitive Strategy 23	High proficient	184	3.27	1.14	2.087	298	.038
	Low proficient	116	2.98	1.20	2.065	2.36	.040

As presented in Table 4.6, a statistically significant difference between high and low-proficient students in terms of overall strategy use shows that high-proficient students have a mean of = 3.27, whereas low-proficient students have a mean of 2.86. It shows that high-proficient students used both cognitive and metacognitive strategies more than low-proficient students. Where cognitive strategies are concerned, high-proficient students have a mean of 3.40, whereas low-proficient students have a mean of 2.95. This proves that high-proficient students use cognitive strategies more than low-proficient students. High-proficient students also have a mean of 3.14, whereas low-proficient students have a mean of 2.62 in terms of metacognitive strategy use which shows that high-proficient students use metacognitive strategies more often.

Table 4.6 T-test of reading strategy use for proficiency differences

Variables	Proficiency	Number of subjects	Mean
All strategies	High proficient	184	3.27
	Low proficient	116	2.86
Cognitive strategies	High proficient	184	3.40
	Low proficient	116	2.95
Metacognitive strategies	High proficient	184	3.14
	Low proficient	116	2.62