GENDER DIFFERENCES IN PERCEIVED AND ACTUAL USE OF COGNITIVE AND METACOGNITIVE STRATEGIES IN AN ENGLISH READING TEST
ความแตกต่างระหว่างเพศในการใช้กลวิธีด้านการเรียนรู้และกลวิธีด้านอภิปัญญาตามการรับรู้และแบบที่ใช้จริงในการทำแบบทดสอบการอ่านภาษาอังกฤษเพื่อความเข้าใจ

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Abstract

This study aimed to investigate gender differences in perceived and actual use of cognitive and metacognitive strategies in an English reading comprehension test. The samples of the study were 250 grade 10 Thai students. First, the students were asked to report their strategy use through a perceived strategy use questionnaire. Two weeks later, the same group of students took the reading test. After finishing the test, they immediately responded to an actual strategy use questionnaire. The data were analyzed by one-way MANOVA. The findings indicated that there were gender differences in perceived strategy use. Females reported using cognitive strategies more often than males did, but gender differences were not found in perceived use of metacognitive strategies. Furthermore, there were no gender differences in the actual use of cognitive and metacognitive strategies in the reading test. The results suggest that gender may not play a significant role in how students use cognitive and metacognitive strategies in a reading test.

Keywords: gender; cognitive strategies; metacognitive strategies; English reading test

บทคัดย่อ

งานวิจัยนี้มีจุดประสงค์เพื่อศึกษาความแตกต่างระหว่างเพศในการใช้กลวิธีด้านการเรียนรู้และกลวิธีด้านอภิปัญญาตามการรับรู้และแบบที่ใช้จริงในการทำแบบทดสอบการอ่านภาษาอังกฤษเพื่อความเข้าใจ กลุ่มตัวอย่าง คือ นักเรียนไทยชั้นมัธยมศึกษาปีที่ 4 จำนวน 250 คน ขั้นแรกนักเรียนตอบแบบสอบถามการใช้กลวิธีตามการรับรู้ จากนั้นสองสัปดาห์นักเรียนทำแบบทดสอบการอ่านภาษาอังกฤษเพื่อความเข้าใจ และตอบแบบสอบถามการใช้กลวิธีตามแบบที่ใช้จริงทันทีหลังจากที่ทำแบบทดสอบเสร็จ ข้อมูลจากแบบสอบถามถูกนำไปวิเคราะห์โดยการวิเคราะห์ความแปรปรวนแบบพหุ ผลการศึกษาพบความแตกต่างระหว่างเพศในการใช้กลวิธีตามการรับรู้ นักเรียนหญิงรายงานว่าใช้กลวิธีด้านการเรียนรู้มากกว่านักเรียนชาย แต่ไม่พบความแตกต่างระหว่างเพศในการใช้กลวิธีด้านอภิปัญญาตามการรับรู้ นอกจากนี้ พบว่าไม่มีความแตกต่างระหว่างเพศในการใช้กลวิธีด้านการเรียนรู้และด้านอภิปัญญาแบบที่ใช้จริงในการทำแบบทดสอบการอ่าน ผลแสดงให้เห็นว่าเพศอาจไม่มีบทบาทสำคัญต่อการใช้กลวิธีด้านการเรียนรู้และกลวิธีด้านอภิปัญญาในการทำแบบทดสอบการอ่าน

คำสำคัญ: เพศ กลวิธีด้านการเรียนรู้ กลวิธีด้านอภิปัญญา แบบทดสอบการอ่านภาษาอังกฤษ

1. INTRODUCTION

A number of research studies have explored how similar or different males and females use strategies in L2 reading. However, the findings on gender differences in reading strategy use may not produce conclusive results. That is, some studies (e.g. [1], [2], [3], [4]) have found such differences, whereas others have found no association between gender and strategy use (e.g. [5], [6], [7]).

In addition, a large number of previous studies have investigated either perceived or actual use of reading strategies without combining both types of strategy use in one study (e.g. [4], [5], [7]). However, there are a few studies exploring how students report and use strategies in a reading context (e.g. [8], [9]).

To date, little research has been conducted on perceived and actual use strategies in testing conditions. Therefore, this study aimed to investigate perceived and actual use of cognitive and metacognitive strategies in a reading test context.

2. RESEARCH OBJECTIVES

To investigate gender differences in the use of cognitive and metacognitive strategies in perceived strategies and in actual use in an English reading comprehension test.

3. RESEARCH QUESTIONS

1. Are there statistically significant gender differences in the perceived use of cognitive and metacognitive strategies?

2. Are there statistically significant gender differences in cognitive and metacognitive strategies in actual use in testing conditions?

4. METHODOLOGY

4.1 Population and sample

The population of this study was 625 grade 10 high school students from Benchamaracharungsarit School in Chachoengsao, Thailand. Based on Yamane's [10] sample size selection, 250 students (125 males, 125 females) were randomly selected using a cluster sampling method.

4.2 Research instruments

Two research instruments were used in this study: an English reading comprehension test and two strategy questionnaires.

The English reading comprehension test was a criterion reference test which was developed based on Bachman and Palmer's [11] framework. The test consisted of 4 passages with 20 items in total. Each passage was followed by 5 items (multiple-choice and short-answer questions). The content of the test was based on the English reading and writing course the students were taking. The test was validated by three experts and tried out with 60 students who were not in the main study. The standardized alpha for 20 questions (KR-20) was .70.

The strategy questionnaires were self-report questionnaires: a perceived strategy use questionnaire and an actual strategy use questionnaire. A 6-point Likert scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, and 5 = always) was used. Each questionnaire written in Thai was comprised of two parts. Part 1 was demographic information consisting of participants' gender, age, class, GPA, and grade of the previous English subject. Part 2 was items on cognitive and metacognitive strategies (see Table 1).

Table 1 Cognitive and metacognitive strategies

Strategies	No. of item	Items
1. Cognitive strategies Repeating	1	7
Skimming	1	5
Scanning	1	6
Deduction	2	8, 9
Inferencing	2	10, 11
Translation	1	13
Transferring	1	12
Taking note	1	14
Summarization	1	18
Highlighting	1	15
Elaboration	2	16, 17
Subtotal	14	
2. Metacognitive strategies Planning	4	1, 2, 3, 4
Monitoring	4	19, 20, 21, 22
Evaluating	2	23, 24
Subtotal	10	
Total	**24**	

In the perceived strategy use questionnaire, the items were in the present simple tense in order to reflect students' habitual strategy use. In the actual strategy use questionnaire, the items were in the past simple tense to reflect strategies students actually used in the reading test.

The two questionnaires were validated by three experts and were piloted with the same 60 students. The Cronbach's alpha based on standardized item was .93 for both questionnaires.

4.3 Procedures

This study was conducted in the first semester of the academic year 2015. First, 250 students (125 males, 125 females) were asked to complete the perceived strategy use questionnaire. Two weeks after that, the same group of student completed the English reading comprehension test. After finishing the test, the students immediately responded to the actual strategy use questionnaire.

5. DATA ANALYSES

To answer both research questions, one-way MANOVA was used. The independent variable was gender, and the dependent variables were cognitive and metacognitive strategies. A significance level of .05 was set. The interpretations of the strategy use are as follows: an average of 3.50-5.0 was considered high strategy use; 2.50-3.49 medium strategy use; and 1.0-2.49 low strategy use [12].

6. RESULTS

6.1 Research question 1

Table 2 shows that male and female students reported using cognitive strategies with medium frequency ($\overline{X}$ = 2.51, $\overline{X}$ = 2.73, respectively), but they reported using metacognitive strategies with low frequency ($\overline{X}$ = 2.44, $\overline{X}$ = 2.39, respectively).

Table 2 Descriptive statistics for males and females' perceived strategy use (n = 250)

Variable	Gender	Mean	S.D	Degree
Cognitive Strategies	Male	2.51	0.71	Medium
	Female	2.73	0.64	Medium
	Total	2.62	0.68	Medium
Metacognitive Strategies	Male	2.44	0.79	Low
	Female	2.39	0.72	Low
	Total	2.41	0.76	Low

One-way MANOVA was used to answer the first research question. The statistical assumptions underlying the use of a one-way MANOVA were checked and it was found that they were not violated. The multivariate correlation was of acceptable limits for MANOVA outcomes (r = .69). Box's M test of equality of Covariance Matrices was not significant (p > .001) – indicating that there were no significant differences between the Covariance Matrices. Thus, the assumption was not violated.

Pillai's Trace was used as the criteria because it was the most powerful and robust, and it could be used with any number of independent variable groups [13]. The results of Pillai's Trace showed that the dependent variable was significantly affected by gender, Pillai's Trace = .062, F (2,242) = 8.12, p = .000, multivariate η^2 = 0.062. The significant F indicated that there were statistically significant gender differences in the perceived use of cognitive and metacognitive strategies. Univariate ANOVA was then used when the multivariate was statistically significant.

Levene's test of equality of error variances indicated that the assumption about homogeneity of variance for each of the dependent measures was not violated. Table 3 shows that univariate ANOVA indicated there was a significant difference between male and female students for cognitive strategies. Based on mean scores, female students ($\overline{X}$ = 2.73) reported using cognitive strategies more often than male students did ($\overline{X}$ = 2.51). However, there were no statistically significant differences between male and female students for perceived use of metacognitive strategies.

Table 3 The results of univariate analysis

Source	Dependent Variables	*MS*	*F*	*df*	*P*	η^2
Gender	Cognitive Strategies	2.87	6.29	1	.013*	.025
	Metacognitive Strategies	.15	.258	1	.612	.001

* $p < .05$

6.2 Research question 2

Table 4 shows that both males and females used cognitive strategies with medium frequency ($\overline{X}$ = 2.53, $\overline{X}$ = 2.70 respectively). Nevertheless, males used metacognitive strategies with low frequency ($\overline{X}$ = 2.49), while females used the strategies with medium frequency ($\overline{X}$ = 2.52).

Table 4 Descriptive statistics for males and females' actual use of cognitive and metacognitive strategies in the reading test (n = 250)

Variable	Gender	Mean	S.D	Degree
Cognitive Strategies	Male	2.53	0.76	Medium
	Female	2.70	0.64	Medium
	Total	2.61	0.71	Medium
Metacognitive Strategies	Male	2.49	0.88	Low
	Female	2.52	0.70	Medium
	Total	2.51	0.79	Medium

One-way MANOVA was used to answer the second research question. The statistical assumptions underlying the use of a one-way MANOVA were checked and it was found that they were not violated. The multivariate correlation was of acceptable limits for MANOVA outcomes (r= .78). Box's M test of equality of Covariance Matrices was not significant (p > .001) – indicating that there were no significant differences between the Covariance Matrices. Thus, the assumption was not violated.

Pillai's Trace was used as the criteria. The results of Pillai's Trace showed that the dependent variable was significantly affected by gender, Pillai's Trace = .026, F (2,247) = 3.71, p = .030, multivariate η^2 = 0.029. The significant F indicated that there were statistically significant gender differences in the actual use of cognitive and metacognitive strategies in the reading test. Univariate ANOVA was then used when the multivariate results were statistically significant.

Levene's test of equality of error variances indicated that the assumption about homogeneity of variance for each of the dependent measures was not violated. Table 5 shows the results of the univariate ANOVA performed. It was found that there were no statistically significant differences between males and females for the actual use of cognitive strategies and metacognitive strategies. The reason why the results show multivariate statistical significance, but no statistical significance in univariate ANOVA, might be that the variables

were very strong within-group correlation (r = .78) [14].

Table 5 The results of univariate analysis

Source	Dependent variables	*MS*	*F*	*Df*	*p*	η^2
Gender	Cognitive Strategies	1.78	3.59	1	.059	.014
	Metacognitive strategies	.05	.074	1	.786	.000

$p < .05$

7. DISCUSSION

With reference to the results on RQ 1, female students reported using cognitive strategies more often than their male counterparts did, while there were no statistically significant differences between males and females for perceived use of metacognitive strategies. A possible explanation for the results could be attributed to students' view toward the use of such strategies. It is possible that female students in the present study perceived these cognitive strategies as socially desirable, regardless of the degree to which these strategies were actually used [15]. Therefore, they reported higher use of these strategies than males.

According to the findings on RQ 2, the students in the present study did not differ in their use of cognitive and metacognitive strategies in the reading test. A possible explanation for the results could be attributed to their previous learning experiences in approaching reading tasks and reading tests [16, 17, 18, 19]. Male and female students in this study have studied at this school since they were in grade 7. Thus, their teachers may have similarly taught them how to tackle the reading problems in the reading tasks or reading tests. For example, teachers may have taught them how to use context clues to find the meaning of unknown words; how to scan the information to find the specific information; and how to skim the passage in order to get the topic or main ideas.

Another possible explanation for no gender differences in the actual use of cognitive and metacognitive strategies could be that these students were similar in their reading ability. Phakiti [20] found that students at the same achievement levels across gender did not differ in their use in either cognitive or metacognitive strategies. Therefore, students in the present study, who received similar reading test scores, which indicated that they may not be different in their reading ability, reported using similar strategies in doing the reading test.

With regard to the results on the differences between males and females in the perceived use of cognitive strategies but not on the actual use, according to Oxford [21], it is possible that "males and females are different in how they report their strategies retrospectively but are not in reality all that different when they actually use strategies" (p. 248). This can explain why significant differences were found in the perceived use of cognitive strategies but were not found in the actual use of such strategies.

In addition, there were no gender differences in the perceived and actual use of metacognitive strategies, most of which were of low frequency. This may indicate that these students lack practice in the use of metacognitive strategies in their language classroom [1]. Therefore, they did not feel that they generally use these strategies in reading or when they did the reading test.

8. IMPLICATIONS

The findings in this study reveal that grade 10 male and female students were different in the way they reported their use of cognitive strategies, but they were not different in the way they reported the use of metacognitive strategies, or the way they actually used both strategies in the reading test. The results suggest that gender may not play a significant role in how students use such strategies in a reading test context.

However, the results of the study also showed that students reported and used such strategies at a low and medium frequency. Therefore, this might indicate that both male and female students would benefit from instruction in the use of cognitive and metacognitive strategies in reading. This is because raising students' awareness of the functions and usefulness of such strategies could help them select and employ more appropriate strategies at various stages of learning their second language [22], [23]. Teaching both cognitive and metacognitive strategies is highly encouraged as teaching only metacognitive strategies without connecting to cognitive strategies may not help students improve their reading comprehension [5].

9. RECOMMENDATION FOR FURTHER RESEARCH

The findings of this study might be in part an artifact of research instruments (i.e. multiple-choice and short-answer questions, and self-report questionnaires) as well as the skills the study focused on. Moreover, the participants in this study were EFL grade 10 high school students in Thailand; therefore, generalizations of the findings to participants in other contexts may be limited. Accordingly, a recommendation for further research is to investigate the gender differences in the perceived and actual use of cognitive and metacognitive strategies in other language skills, using a variety of test formats and with participants who have different backgrounds or who study English as a second language. Apart from the questionnaire, further research should include verbal reports, particularly with the use of audio-recording and video-recording devices. This is because using only one research instrument may not demonstrate all of the strategies use [24], [25]. Students may report what they believe about what they do rather than what they actually do [26]. Finally, gender is the only one factor examined in this study. Hence, further research should use other factors such as motivation, language performance, or background knowledge to investigate the differences in the strategy use. Males and females might use strategies differently because of their motivation [27].

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