

**MULTIPLE INTELLIGENCES, THINKING STYLES,
READING STRATEGIES AND READING PERFORMANCE
BY CHINESE EFL STUDENTS**



**A Thesis Submitted in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in English Language Studies**

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พหุปัญญา รูปแบบความคิด กลวิธีในการอ่านและความสามารถในการอ่าน
ของนักศึกษาจีนที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ



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ปีการศึกษา 2556

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ความแตกต่างระหว่างผู้เรียนแต่ละคนเป็นปัจจัยสำคัญที่มีต่อผลการเรียนรู้ภาษาที่สอง การศึกษาวิจัยเกี่ยวกับความแตกต่างระหว่างปัจเจกบุคคลได้สนับสนุนและพัฒนาทฤษฎีทางการเรียนรู้มากยิ่งขึ้น การวิจัยนี้มีวัตถุประสงค์เพื่อสำรวจความสัมพันธ์ที่อาจเกิดขึ้นได้ระหว่าง พหุปัญญา (Multiple intelligences) รูปแบบการคิด (Thinking styles) กลวิธีในการอ่าน (Reading strategies) และความสามารถทางการอ่าน (Reading performances) ของผู้เรียนวิชาเอกภาษาอังกฤษในฐานะภาษาต่างประเทศชาว จีนจำนวนสามร้อยสี่คน ที่มหาวิทยาลัยค้ายหลี่ (Kaili University) การวิจัยนี้ใช้แบบสอบถามทางออนไลน์จำนวนสามชุด ประกอบด้วย แบบสอบถามพหุปัญญา (the Multiple Intelligences Inventory) แบบสอบถามรูปแบบการคิด (the Thinking Styles Inventory) แบบสอบถามกลวิธีในการอ่าน (the Reading Strategy Questionnaire) และแบบทดสอบความสามารถทางการอ่านจับใจความสำคัญ (the Reading Comprehension Test) เพื่อเก็บรวบรวมข้อมูล สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ สถิติพรรณนา (Descriptive statistics) การทดสอบค่าที่เป็นอิสระจากกัน (Independent-Samples T-tests) การวิเคราะห์ความแปรปรวนแบบทางเดียว (One-Way ANOVA) การหาค่าสัมประสิทธิ์สหสัมพันธ์แบบเพียร์สัน (Pearson's correlation coefficient) และการวิเคราะห์การถดถอยพหุคูณ (Multiple regression analysis) ซึ่งผลการวิจัยพบว่า

1. ผู้เรียนได้คะแนนในระดับสูงในหลายรายการ ทั้งทางด้านพหุปัญญา รูปแบบการคิด และกลวิธีในการอ่าน ซึ่งบ่งชี้ว่าผู้เรียนมีอัจฉริยภาพรอบด้าน โดยเมื่อพิจารณาทางด้านพหุปัญญา เขาว่าปัญญาด้านภาษา (Linguistic intelligence) ของผู้เรียนจัดอยู่ในระดับสูงสุด และเขาว่าปัญญาด้านมิติสัมพันธ์ (Spatial/visual intelligence) อยู่ในระดับต่ำสุด เมื่อพิจารณาในด้านรูปแบบการคิด การคิดแบบเก่งบริหารจัดการ (Executive style) จัดอยู่ในระดับสูงสุด และการคิดแบบอนุรักษ์นิยม (Conservative style) อยู่ในระดับต่ำสุด เมื่อพิจารณาในด้านกลวิธีในการอ่าน กลวิธีในการอ่านที่นักศึกษาใช้บ่อยที่สุดคือกลวิธีปริชาน (Cognitive strategies) และ ใช้กลวิธีอภิปริชาน (Metacognitive strategies) ในระดับต่ำสุด เมื่อพิจารณาทางด้านเพศ พบว่า มีความแตกต่างกันอย่างมีนัยสำคัญ ทั้งทางด้านพหุปัญญา และรูปแบบการคิด ระหว่างเพศชายและเพศหญิง ในขณะที่ ไม่พบความแตกต่างอย่างมีนัยสำคัญระหว่างเพศชายและเพศหญิง ทางด้านการใช้กลวิธีในการอ่าน เมื่อเปรียบเทียบ

เชาว์ปัญญาด้านต่างๆ จำนวนเก้าด้านที่เป็นองค์ประกอบในทฤษฎีพหุปัญญา พบว่า มีเพียงเชาว์ปัญญาด้านร่างกายและการเคลื่อนไหว (Bodily-kinesthetic intelligence) เท่านั้น ที่มีความแตกต่างกันอย่างมีนัยสำคัญระหว่างเพศชายและเพศหญิง เมื่อพิจารณาทางด้านรูปแบบการคิด พบว่า มีเพียงการคิดแบบมองภาพรวม (Global style) และการคิดแบบร่วมมือ (External style) เท่านั้น ที่มีความแตกต่างกันอย่างมีนัยสำคัญระหว่างเพศ อย่างไรก็ตาม ไม่พบความแตกต่างกันอย่างมีนัยสำคัญระหว่างทั้งสองเพศในรูปแบบการใช้กลวิธีการอ่านทั้งสี่แบบ

เมื่อพิจารณาด้านลักษณะกลุ่มชาติพันธุ์ (Ethnicity) พบว่า มีเพียงเชาว์ปัญญาของทฤษฎีพหุปัญญาและรูปแบบการคิดรวมกันเพียงสี่ด้านเท่านั้นคือเชาว์ปัญญาด้านการเข้าใจตนเอง (Intrapersonal intelligence) การคิดแบบจัดสรรขาดระเบียบ (Anarchic style) การคิดแบบยึดถือตนเอง (Internal style) และการคิดแบบอนุรักษ์นิยม (Conservative style) ที่มีความแตกต่างกันระหว่างกลุ่มชาติพันธุ์ทั้งสี่กลุ่ม ในขณะที่ ไม่พบความแตกต่างทางด้านความถี่ของการใช้กลวิธีการอ่าน ระหว่างกลุ่มชาติพันธุ์ทั้งสี่กลุ่ม

2. พหุปัญญาของผู้เรียนมีความสัมพันธ์อย่างใกล้ชิดกับรูปแบบการคิดโดยทั่วไป เชาว์ปัญญาด้านต่างๆ ทั้งหมดของทฤษฎีพหุปัญญามีความสัมพันธ์อย่างมีนัยสำคัญกับรูปแบบการคิดทั้งหมดในทุกรูปแบบ

3. พหุปัญญาของผู้เรียนมีความสัมพันธ์โดยทั่วไปกับการใช้กลวิธีการอ่านอย่างมีนัยสำคัญ โดยพบว่า เชาว์ปัญญาเจ็ดด้านในพหุปัญญาทั้งเก้าด้านมีความสัมพันธ์กับกลวิธีการอ่านทุกแบบอย่างมีนัยสำคัญ

4. รูปแบบการคิดของผู้เรียนมีความสัมพันธ์กับกลวิธีการอ่านอย่างมีนัยสำคัญ โดยกลวิธีการอ่านเกือบทุกแบบมีความสัมพันธ์กับรูปแบบการคิดในด้านต่างๆ ทุกด้านอย่างมีนัยสำคัญ

5. ความสามารถทางการอ่านของผู้เรียนสามารถทำนายได้จากพหุปัญญา รูปแบบการคิด และกลวิธีการอ่านในระดับหนึ่ง เมื่อพิจารณาพหุปัญญาทั้งเก้าด้าน พบว่า มีเพียงเชาว์ปัญญาด้านตรรกศาสตร์ (Logical intelligence) เชาว์ปัญญาด้านมิติสัมพันธ์ (Spatial/visual intelligence) และเชาว์ปัญญาด้านดนตรี (Musical intelligence) เท่านั้น ที่สามารถทำนายความสามารถทางการอ่านอย่างมีนัยสำคัญ เมื่อพิจารณารูปแบบการคิดทั้ง 13 แบบ พบว่า มีเพียงการคิดแบบเก่งบริหารจัดการเท่านั้น ที่สามารถทำนายความสามารถทางการอ่าน เมื่อพิจารณากลวิธีการอ่านทั้งสี่แบบ พบว่า มีเพียงกลวิธีอภิปรายเท่านั้น ที่สามารถทำนายความสามารถทางการอ่านของผู้เรียน

สาขาวิชาภาษาต่างประเทศ

ปีการศึกษา 2556

ลายมือชื่อนักศึกษา _____

ลายมืออาจารย์ที่ปรึกษา _____

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SIXIANG PENG : MULTIPLE INTELLIGENCES, THINKING STYLES,
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MULTIPLE INTELLIGENCES/THINKING STYLES/ READING
STRATEGIES/READING PERFORMANCE/RELATIONSHIP

Individual learner differences (IDs) are regarded as one of the most important variables influencing learners' outcomes in SLA. The study of IDs has increasingly contributed to the development of related learning theories. The purpose of the present study is to investigate the possible relationships between Chinese EFL Majors' multiple intelligences (MI), thinking styles (TS), reading strategies (RS) and reading performances (RP). Three hundred and four EFL Majors at Kaili University participated in the study. Three online questionnaires (the MI Inventory, the TS Inventory and the RS Questionnaire) and a reading proficiency test were employed to collect the data. Descriptive statistics, Independent-Samples t-tests, One-Way ANOVA, Pearson's correlation coefficient (r), and multiple regression analysis methods were employed to analyze the data. The findings revealed that: 1) Students scored highly on many MI, TS, and RS indicating that they were multi-talented in all areas. With respect to MI, students' linguistic intelligence ranked the highest, while spatial/visual intelligence ranked lowest. Regarding TS, the executive style was reported to be highest, while conservative style was the lowest. In respect of RS, the most frequently used strategies were cognitive strategies, while the lowest were metacognitive strategies. With regard to gender, there were significant differences in

MI and TS between male and female students, while no significant differences could be found between males and females on RS. Among the nine individual types of MI, only bodily/kinesthetic intelligence was found to have significant difference between males and females. As for TS, only global and external styles were found to have significant gender difference. However, no significant gender difference was identified in the scores on all four types of RS. Concerning ethnicity, only 4 individual types of MI and TS were found to have differences among the four ethnic groups. They were intrapersonal intelligence, anarchic, internal, and conservative styles; while no ethnic differences could be found among the four groups on the frequency of RS use. 2) Students' MIs closely correlated with their TS in general. Most types of individual MI correlated significantly with all individual types of TS. 3) Students' MI significantly correlated with their RS in general. Seven out of the nine individual types of MI were found to have significant correlations with all types of RS. 4) Students' TS significantly correlated with their RS. Almost all types of RS significantly correlated with all individual types of TS. 5) Students' RP could be predicted from their MI, TS, and RS to some extent. Among the nine types of MI, only logical, spatial/visual and musical intelligences were discovered to predict RP significantly. Among the 13 individual types of TS, only executive style was discovered as a predictor of RP. In respect of the four individual types of RS, only the metacognitive strategy was found to be a predictor of RP.

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Academic year 2013

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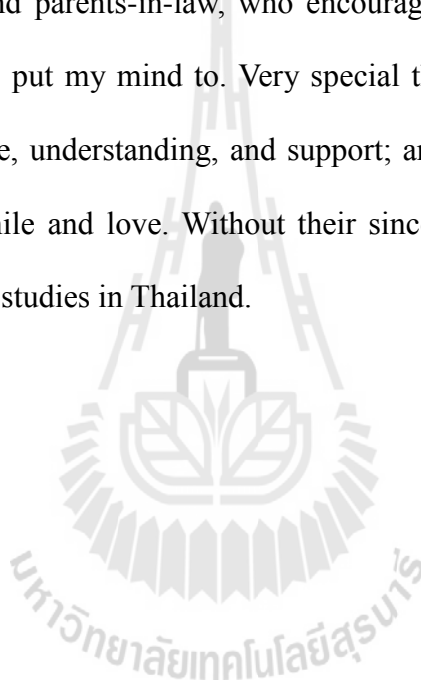


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LIST OF ABBREVIATIONS

ANS.....	Anarchic Style
AP.....	Academic Performance
BKI.....	Bodily-kinesthetic Intelligence
CEC.....	College English Curriculum Requirement
CET.....	College English Test
CGS.....	Cognitive Strategies
CPS.....	Compensation Strategies
CSS.....	Conservative Style
EFL.....	English as a Foreign Language
ELT.....	English Language Teaching
ESI.....	Existential Intelligence
ESL.....	English as a Second Language
ETS.....	External Style
EXS.....	Executive Style
GLS.....	Global Style
HA.....	Holistic-analytical
HRS.....	Hierarchical Style
InteI.....	Interpersonal Intelligence
IntrI.....	Intrapersonal Intelligence
ITS.....	Internal Style
JDS.....	Judicial Style

LIST OF ABBREVIATIONS (Continued)

KU.....	Kaili University
LBS.....	Liberal Style
LCS.....	Local Style
LCT.....	Listening Comprehension Test
LGI.....	Linguistic Intelligence
LGS.....	Legislative Style
LLS.....	Language Learning Strategies
LMI.....	Logical/Mathematical Intelligence
LSS.....	Language Strategy Survey
L2.....	Second Language
MI.....	Multiple Intelligences
MIDAS.....	Multiple Intelligences Development Scales
MII.....	Multiple Intelligences Inventory
MIT.....	Multiple Intelligences Theory
MNS.....	Monarchic Style
MOE.....	Ministry of Education
MS.....	Memory Strategies
MSI.....	Musical Intelligence
MTS.....	Metacognitive Strategies
NEC.....	New English Curriculum
NMET.....	National Matriculation English Test
NTI.....	Naturalistic Intelligence

LIST OF ABBREVIATIONS (Continued)

OLS.....	Oligarchic Style
RCT.....	Reading Comprehension Test
RP.....	Reading Performances
RS.....	Reading Strategies
SCS.....	Social Strategies
SILL.....	Strategy Inventory for Language Learning
SORS.....	Survey of Reading Strategies
SVI.....	Spatial/Visual Intelligence
TBA.....	Task-Based Approach
TEFL.....	Teaching English as a Foreign Language
TEM.....	Test for English Majors
TESL.....	Teaching English as a Second Language
TS.....	Thinking Styles
TSE.....	Teaching Syllabus for English Majors
TSL.....	Thinking Styles Inventory
VI.....	Verbal-Imager

CHAPTER 1

INTRODUCTION

This chapter aims to provide an introduction to the present study. It covers eight sections: Section **1.1** introduces the background of the study; Section **1.2** is a statement of the problem; Section **1.3** addresses the purpose of the study; Section **1.4** formulates the research questions; Section **1.5** presents the significance of the study; Section **1.6** lists the definitions of some key terms; and, lastly, Section **1.7** provides a summary of this chapter.

1.1 Background of the Study

As a global language, English is becoming increasingly important in a number of fields. Crystal (1997) and Nunan (2003) suggest that the general consensus is that English has become a global language, a language which is widely used in higher education, business, technology, science, and the Internet. At present, English has been named an international language, a lingua franca, a global language, and a world language (McArthur, 2004; Erling, 2005; Jenkins, 2006). Teaching English as a foreign language (TEFL)/Teaching English as a second language (TESL) is being discussed by countless researchers. Since the 1970s, research focusing on second language acquisition has shifted from teaching to learning, and increasing studies

have been done from learners' perspectives. The study of individual learner differences (IDs) comprises an important area of work in second language acquisition (SLA) research and contributes to theory development. It has a long history that pre-dates the beginning of SLA as a field of enquiry (Ellis, 2008, p.640-43). Many studies have paid much attention to the relationship between learners' achievements and their individual differences (Ellis, 1997). Learners and learning come to the center of the research: the differences between learning and learners are highlighted (Wang & Jin, 2008, p. 30). Many studies have shown that factors such as intelligence, working memory, language aptitude, learning style, motivation, anxiety, personality, willingness to communicate, learner beliefs, and learning strategies are considered 'core factors' as influencing individual learner differences in language learning (Skehan, 1989; Dörnyei, 2005). This is probably due to language learning not being an issue of linguistics any more, but of inter-discipline issues involving educational psychology, cognitive linguistics, psycholinguistics, neurolinguistics, and so forth. Traditionally, many psychologists and educators have believed that people's successes and failures were attributable mainly to individual differences in abilities (Sternberg, 1997; Zhang, 2002_c). People may be practically identical in their abilities and yet have very different styles. Different people may have very different styles because they have individual differences in cognitive styles such as learning styles and thinking styles. A style is a preferred way of thinking. It is not an ability, but rather, a preferred way of using the abilities one has (Sternberg, 1997, p.8). Styles are of interest to

educators because they predict academic performance in ways that go beyond abilities (Marton & Booth, 1997, cited in Sternberg & Zhang, 2001). Multiple intelligences, thinking styles, and learning strategies have been influencing learners' academic achievements in different ways.

Multiple intelligences (MI) theory, as a learning theory, was proposed by Howard Gardner in 1983. For the past 30 years, it has been widely put into practice in pre-school education, primary and secondary schools in many countries in the world. In higher education, MI has received scant attention and there are debates on whether or not the theory can be applied to students in tertiary education (Barington, 2004). Many researchers have attempted to study the use of MI in English language teaching (ELT) from the view points of teaching, learning and evaluation (Smith, 2001; Arnold & Fonseca, 2004; Akbari & Hosseini, 2008; Saricaoglu & Arikan, 2009; Hou, 2010; Naeini & Pandian, 2010; Hajhashemi, et al., 2011).

Style, as one of the important individual-difference variables in language learning, has also been the focus of many researchers (Yeatts & Strag, 1971; Pendleton, 1975; Saracho, 1984; Riding & Caine, 1993; Kim & Michael, 1995; Drysdale, Ross, & Schulz, 2001). In the study of styles, many theoretical models have been postulated since the late 1950s (Zhang, 2004). Learning styles are the reflections of thinking styles in the field of education. Thinking styles (TS), which developed from Sternberg's (1988) theory of mental self-government, have been studied for many years. In the field of education, research interest has been focused on

identifying the contributions of thinking styles to students' academic performance because the emergence of theories of styles was deeply rooted in the need for explaining students' individual differences in academic performance that are beyond the explanation of their abilities (Zhang, 2004). To investigate the contributions of thinking styles to language education, a series of studies have been conducted by many researchers (Sternberg, 1990, 1997; Zhang & Sachs, 1997; Cano-Garcia & Hughes, 2000; Zhang, 2000_a, 2000_b, 2001_a, 2001_b, 2002_a, 2002_b, 2002_c, 2003, 2004_a, 2004_b, 2005, 2006_a, 2006_b, 2007, 2008, 2009, 2010_a, 2010_b, 2011; Zhang & Sternberg, 2000, 2001, 2005_a, 2005_b, 2006; Bernado et al., 2002; Zhang, Sternberg & Rayner, 2012) in five cultural groups: Hong Kong, mainland China, the Philippines, Spain, and the United States.

Learning strategies, as another important learners' individual-difference variable, have been focused on more greatly by a number of educators and researchers in the field of second language acquisition (SLA) since the 1970s (Rubin, 1975; O'Malley & Chamot, 1990; Oxford, 1989, 1990, 1999, 2000, 2001; Wen, 1996; Cohen & Chi, 2001; Wen & Wang, 2004; Cohen, 1998, 2008). Learning strategies are also one of the main factors determining how and how well learners learn an L2 (Oxford, 2001).

However, despite these studies, there has been little attention given to the interrelations between multiple intelligences, thinking styles, and language learning strategies and whether they influence learners' academic performance.

1.2 General Statement of the Problem

1.2.1 English Teaching and Learning in China

With world multi-polarization and economic globalization, English is playing an increasingly important role in the world. In China, English is taught as a foreign language (EFL), and is also the most-studied language. With its specific social and cultural background, TEFL in China is different from that of western countries. This makes the characteristics of Chinese learners different from those of western learners. As Watkins and Biggs (1996) stated, “Chinese students are typically perceived, often wrongly, as passive rote learners”.

1.2.1.1 The Role of Reading in English Teaching Syllabi of All

Levels

English has become a compulsory course in primary schools, secondary schools and higher educational institutions (colleges/universities). There are national English teaching syllabi in different levels from primary school to college/university.

Reading plays an increasingly important part in today's Chinese TEFL. Reading comprehension ability is viewed as the most important skill in English language learning, which is directly concerned with whether readers can smoothly achieve reading comprehension (Zhang & Pan, 2010). The English teaching syllabi of all levels demand that English teachers give emphasis to the four basic skills, especially on the development of students' reading competence.

In September 2001, a new national curriculum was introduced at the primary school level with English now being taught from grade three (age nine). As a language benchmark, the New English Curriculum Standards (MOE, 2003) is for primary and secondary schools with nine levels. The College English Curriculum Requirements are issued for Non-English majors.

The teaching objective of college English is to help students develop a relatively strong reading ability and general skills of listening, speaking, writing and translating, and by so doing make students able to use English for communication. College English is intended to help students lay a solid foundation of language skills, acquire good language learning strategies, nourish their liberal accomplishment, and adapt themselves to the requirements of social development and economic construction. (MOE, 2007)

In the case of English majors, a national Teaching Syllabus for English Majors was issued in 2000. The goal of the curriculum consists of two stages: the fundamental stage and the advanced stage.

The goal of the fundamental stage of is to teach basic knowledge of English, to have students strictly trained in all-round fundamental language skills (listening, speaking, reading, and writing), and to foster students' ability to use the language for real situations, good study style and correct learning methods, and to lay a solid foundation for their studies at the advanced stage. The goal of the advanced stage is to continue the basic skills training, to equip students with specialized knowledge and specialty-related knowledge, to

further broaden their knowledge scope, to enhance their awareness of cultural differences, and to better their comprehensive use of English for communications. (MOE, 2000)

As one of the two forms of language input, undoubtedly, reading is clearly described in syllabi. In the undergraduate program, Reading is a core component which is taught in the first two years from level one to level four. In addition, there are some elective courses on reading such as Fast Reading, Selected British & American Newspaper Readings, Selected Readings of British & American Literature, etc.

1.2.1.2 English Testing

In addition to school-level achievement tests, there are national proficiency tests for different levels in China. After six years of English study, senior high school students are required to take the National Matriculation English Test (NMET) which is held in June every year. For tertiary levels, students are required to pass a national proficiency test to obtain a Bachelor's Degree. This involves the four language skills—listening, speaking, reading, and writing. Non-English majors are required to pass the College English Test—Grade Four (CET-4), and English major students are required to pass the Test for English Majors—Grade Four (TEM-4). It is believed that both English and non-English majors have difficulties in the reading comprehension part, which is regarded as the most important one in the tests.

1.2.2 Research into Thinking Styles in China

Over the past decades, scholars have carried out many research projects on thinking styles in the field of education. However, the majority of the research studies are on learners' thinking styles, personalities, relation between thinking styles and learning styles, thinking styles and learning strategies, etc., and most of which have been conducted by Robert Jeffrey Sternberg and Li-Fang Zhang, with a few studies by researchers in mainland China. There have been no empirical research studies focusing on the interrelationship between multiple intelligences, thinking styles, reading strategies and reading performance.

1.3 Purpose of the Study

The purpose of the present study is to investigate the possible relationships between Chinese English Major EFL undergraduates' multiple intelligences, thinking styles, reading strategies and reading performance. More specifically, the purposes are to explore:

- 1) the overall profiles of the Chinese English Major EFL learners' multiple intelligences, thinking styles, and reading strategies; whether there are significant differences depending on gender and ethnicity;
- 2) the relationships between the Chinese English Major EFL learners' multiple intelligences and thinking styles;
- 3) the relationships between the Chinese English Major EFL learners' multiple intelligences and reading strategy use;

4) the relationships between the Chinese English Major EFL learners' thinking styles and reading strategy use;

5) whether the Chinese English Major EFL learners' reading performance can be predicted by their multiple intelligences, thinking styles, and reading strategies.

1.4 Research Questions

Based on the purposes of the study, the following five research questions will be addressed:

1) What are the overall profiles of the Chinese English Major EFL learners' multiple intelligences, thinking styles, and reading strategies? Are there any significant differences in terms of learners' gender and ethnicity?

2) What are the relationships between the Chinese English Major EFL learners' multiple intelligences and thinking styles?

3) What are the relationships between the Chinese English Major EFL learners' multiple intelligences and reading strategies use?

4) What are the relationships between the Chinese English Major EFL learners' thinking styles and reading strategies use? And

5) To what extent can the Chinese English Major EFL learners' reading performance be predicted from their multiple intelligences, thinking styles, and reading strategies?

1.5 Significance of the Study

This study makes an attempt to help both teachers and students solve the problems, and enhance the development of English learning and teaching in Kaili University (KU), and potentially, in other universities in China. The primary significance of the study is that it may fill in the gap and provide new evidence to research between multiple intelligences, thinking styles, reading strategies, and reading performance because no empirical studies in this area have been conducted in China so far.

Secondly, exploration of the correlations of achievement to multiple intelligences, thinking styles, and reading strategies will help teachers to re-recognize the importance of individual differences in classroom teaching.

Thirdly, the findings of the study will provide a number of correlations relating to learners' multiple intelligences, thinking styles, and reading strategies which may enrich the research into learners' individual differences in the future.

Fourthly, the findings of the study will provide valuable information in relation to the training of learners' multiple intelligences, thinking styles, and reading strategies.

Fifth, the findings of the study can be a contribution to the curriculum or syllabus reform in China. The study may provide recommendations for future reform of the teaching syllabus for English Majors or other levels.

Finally, the findings of the study may have some pedagogical implications for both EFL teachers and learners in China, and potentially, in other non-English-speaking countries, and in the field of second/foreign language learning in general.

1.6 Definitions of Terms

The following terms are relevant to the present study:

1.6.1 Cognitive Style

Witkin (1976) characterized cognitive style “as a potent variable affecting a number of arenas; the student’s continuing academic development, how students learn and teachers teach, and how students interact in the classroom” (p.39). According to Saracho (1998), “Cognitive style, an integrated component in the individuals’ psychological differentiation, determines the individuals’ responses and functioning in numerous situations. It represents one dimension of individual differences and includes stable attitudes, choices, and habitual strategies related to an individual’s style of perceiving, remembering, thinking, and solving problems” (p.287).

1.6.2 College English Curriculum Requirements

The College English Curriculum Requirements is a guidance document on college English teaching for non-English majors in China which includes objectives, teaching requirements (listening, speaking, reading, writing, translation and recommended vocabulary), course design, teaching model, evaluation, and teaching administration.

1.6.3 English Major EFL Learners

The phrase English Major EFL Learners refers to the undergraduate students majoring in English in China. In the present study, it refers specifically to the undergraduate students majoring in English in Kaili University, Guizhou, China.

1.6.4 Item-Objective Congruence Index

Item-Objective Congruence Index (IOC) described by Hambleton and Rovinelli (1986, pp. 287-302) is utilized to assess the degree to which an item has validity. The formula ($IOC = \sum R / N$) is based in the assumption that, in the ideal case, an item would be matched with only one objective of the set.

1.6.5 Multiple Intelligences

Gardner (1993) defined intelligence as “the ability to solve problems or fashion products that are valued in one or more cultural settings” (p.87). Multiple intelligences in this study include 9 different intelligences: bodily-kinesthetic intelligence, intrapersonal intelligence, interpersonal intelligence, linguistic intelligence, logical-mathematical intelligence, musical intelligence, spatial intelligence, naturalist intelligence, and existential intelligence.

1.6.6 New English Curriculum

The New English Curriculum (NEC) is a nation-wide curriculum (English language benchmarks) for Basic English teaching and learning in China. The curriculum is divided into nine levels which range from primary school, junior high school to senior high school.

1.6.7 National Matriculation English Test

The National Matriculation English Test (NMET) is a nation-wide English test for senior high school students before they enter a college or university in China.

1.6.8 Reading Performance

Reading performance (RP) refers to how learners perform a reading task in a language test. In this study, it refers specifically to how the participants perform on the Reading Comprehension Test (RCT) in a TEM-4.

1.6.9 Test for English Majors

The Test for English Majors (TEM) is an important test for English majors in Chinese colleges and universities. The TEM assesses the language performance of English majors and is administrated by the National Advisory Commission on Foreign Language Teaching in Higher Education (NACFLT) in China. Another purpose of the test is to promote English teaching and learning for English majors. Students' performances are evaluated against the criteria stipulated in the teaching syllabus (Zou, 2003). The test consists of two levels: TEM-4 administered at the end of the 2nd year, and TEM-8 at the end of the 4th year in their undergraduate program.

1.6.10 Thinking Styles

Thinking styles (TS) refers to one's habitual patterns or preferred ways of thinking while doing something (Sternberg, 1988, 1997). As a type of cognitive style, thinking styles in this study is developed from Sternberg's mental self-government theory which includes 13 thinking styles that fall along five dimensions of mental self-government: functions (legislative, executive, and judicial thinking styles), forms

(hierarchical, oligarchic, monarchic, anarchic thinking styles), levels (global and local thinking styles), scopes (including internal and external thinking styles), and leanings (liberal and conservative thinking styles) of government as applied to individuals.

1.6.11 Teaching Syllabus for English Majors

The Teaching Syllabus for English Majors (TSE), which was compiled by the Higher Education Institution Foreign Language Teaching Supervisory Committee English Group (HFSG) in China in 2000, is a guideline on teaching English for English majors which involves objectives, course design, teaching principles, and evaluation.

1.7 Summary

This chapter gave a brief introduction to the study. It first described the background of the study. And then, the general statement of problems in TEFL in China, the purposes of the study, research questions, the significance of the study, and some definitions of frequently used terms in the study were briefly discussed. In the next chapter, a review of the related literature on multiple intelligences, thinking styles, and reading strategies in the present study will be presented.

CHAPTER 2

REVIEW OF THE RELATED LITERATURE

This chapter provides a review of the literature related to the present study. More specifically, it focuses on the review of the literature related to the research questions of the study. It consists of three sections: Section **2.1** reviews a number of theories which cover multiple intelligences theory, theory of cognitive styles, theory of thinking styles, learning styles, learning strategies, reading strategies, and testing for English majors; Section **2.2** identifies and discusses previous research studies into multiple intelligences, thinking styles, reading strategies and reading performance, which involves relationship between multiple intelligences, thinking styles, and reading strategies, and relationship between multiple intelligences/thinking styles/reading strategies and academic achievement/reading performance. Lastly, Section **2.3** presents a summary of this chapter.

This review will give a basis for the choices made in Chapter Three and subsequent chapters.

2.1 Theories Related to Multiple Intelligences, Thinking Styles and Reading Strategies

The relevant literature into the theories of the present study involves multiple intelligences, cognitive styles, thinking styles, language learning strategies, and reading strategies.

2.1.1 Multiple Intelligences

2.1.1.1 The Definition of Intelligence

Gardner (1993) defined intelligence as “the ability to solve problems or fashion products that are valued in one or more cultural settings” (p.87). In 2006, Gardner revised the definition to “as a bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in culture” (pp. 33-34).

2.1.1.2 Gardner’s Criteria for Intelligence

To provide a theoretical foundation for identification of individual intelligences, Gardner (1983) stipulated a set of eight criteria or signs, “a reasonable set of factors to be considered in the study of human cognition” (Gardner, 2011). The criteria for identification of “intelligence” are presented in **Table 2.1**:

Table 2.1 Criteria for Identification of an Intelligence

Criteria for Identification of an Intelligence
● It should be seen in relative isolation in prodigies, autistic savants, stroke victims or other exceptional populations. In other words, certain individuals should demonstrate particularly high or low levels of a particular capacity in contrast to other capacities.
● It should have a distinct neural representation—that is, its neural structure and functioning should be distinguishable from that of other major human faculties
● It should have a distinct developmental trajectory. That is, different intelligences should develop at different rates and along paths which are distinctive.
● It should have some basis in evolutionary biology. In other words, intelligence ought to have a previous instantiation in primate or other species and putative survival value.
● It should be susceptible to capture in symbol systems, of the sort used in formal or informal education.
● It should be supported by evidence from psychometric tests of intelligence.
● It should be distinguishable from other intelligences through experimental psychological tasks.
● It should demonstrate a core, information-processing system. That is, there should be identifiable mental processes that handle information related to each intelligence.

2.1.1.3 Multiple Intelligences Theory

According to Gardner (1983, 1993, cited in Palmer, 2011), “all individuals have personal intelligence profiles that consist of combinations of seven different intelligence types. These intelligences are: verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical-rhythmic, intrapersonal, and

interpersonal” (p.4). Gardner later added an eighth intelligence type to the list, that of naturalist intelligence. At the same time he suggested the existence of a ninth intelligence type, that of existentialist intelligence (Gardner, 1999_a). Each one of the nine intelligences can function independently of the others, and individuals may have their own weaknesses and strengths in each of these. Gardner (1993) regards his theory as egalitarian since it values different manifestations of intelligence in different individuals and strives to provide a stimulating family and learning context which will be conducive to the development of these abilities in children and individuals. No single type of intelligence is viewed as being superior to the others. The nine intelligences are described as **Table 2.2**:

Table 2.2 The Nine Component Intelligences of Gardner’s Theory

Intelligence	Description
Verbal/linguistic	Effective use of language and good knowledge of words
Musical	Sensitive to melody and rhythm
Logical/Mathematical	Effective use of numbers, ability to deduce conclusions, ability to see cause and effect
Spatial/visual	Sensitivity to color and design, sensitivity to graphic forms
Bodily/kinesthetic	Physical/bodily coordination
Interpersonal	The ability to understand others, their intentions, moods
Intrapersonal	Knowledge of the self
Natural	To know and care about nature
Existential	To brood on the meaning of life

(Source: Akbari & Hosseini, 2008, pp.141-155)

What follows is a description of the nine intelligences defined by Gardner (1993, 1999_b):

Linguistic Intelligence

Gardner has describes linguistic intelligence (LGI) as sensitivity to spoken and written language and the ability to use language to accomplish goals, as well as the ability to learn new languages. According to Gardner (1993), lawyers, public speakers, writers, and poets all possess high levels of linguistic intelligence.

Musical Intelligence

Gardner (1999_b) suggests that musical intelligence (MSI) is parallel in structure to linguistic intelligence, and that it is reflected in the performance, composition and appreciation of musical patterns. With regard to the underlying abilities involved in his musical intelligence, Gardner has claimed that the two most central constituent elements of music are rhythm and pitch (or melody), followed in importance by timbre (which Gardner, 1983, p. 105, describes as the characteristic qualities of a tone).

Logical/Mathematical Intelligence

Gardner describes logical/mathematical intelligence (LMI) as the ability to study problems, to carry out mathematical operations logically and analytically, and to conduct scientific investigations. Gardner identified mathematicians, logicians, and scientists as persons who would possess high levels of this hypothesized intelligence.

Spatial/Visual Intelligence

Gardner defines spatial intelligence (SVI) as the ability to recognize both large and small visual patterns. He suggested that navigators and pilots would possess high levels of spatial intelligence, as would sculptors, surgeons, chess players, and architects.

Bodily-Kinesthetic Intelligence

Gardner (1999_b) described bodily-kinesthetic intelligence (BKI) as the potential for using the whole body or parts of the body in problem-solving or the creation of products. Gardner identified not only dancers, actors, and athletes as those who excel in bodily-kinesthetic intelligence, but also craftspeople, surgeons, mechanics, and other technicians.

Interpersonal Intelligence

According to Gardner (1983), an individual who is high in interpersonal intelligence (InteI) understands the intentions, motivations, needs, and desires of others, and is capable of working effectively with them. Gardner stated that teachers, clinicians, salespeople, politicians, and religious leaders all use interpersonal intelligence.

Intrapersonal Intelligence

Gardner (1999_b) described intrapersonal intelligence (IntrI) as the ability to understand and to have an effective working model of oneself. Intrapersonal intelligence, as conceptualized by Gardner, includes the awareness of one's own desires, fears, and abilities, and also using this information to make sound life decisions.

Naturalistic Intelligence

Gardner (1999_b) described a naturalist as one who is able to recognize and classify objects. According to Gardner, hunters, farmers, and gardeners would have high levels of naturalistic intelligence (NTI), as would artists, poets, and social scientists, who are also adept at pattern-recognition.

Existential Intelligence

Gardner (1999_b) considered existential intelligence (EXI) as the intelligence of understanding in a large context or big picture.

It is the capacity to tackle deep questions about human existence, such as the meaning of life, why we die, what my role is in the world. This intelligence seeks connections to the real world and allows learners to see their place in the big picture and to observe their roles in the classroom, society and the world or the universe. Existential intelligence includes aesthetics, philosophy, and religion and emphasizes the classical values of beauty, truth and goodness. Those with a strong existential intelligence have the ability to summarize and synthesize ideas from across a broad unit of study.

Based on Gardner (1983, 1993, and 1999_b), Berman (2002), and Christison (2005), Palmberg (2011) describes the learning characteristics of each of Gardner's nine intelligence types as the following:

Linguistic learners enjoy expressing themselves orally and in writing and love wordplay, jokes, riddles and listening to stories. *Logical-mathematical learners* display an aptitude for numbers, reasoning, logic and problem solving, whereas *visual-spatial learners* tend to think in pictures and mental images and enjoy illustrations, charts, tables and maps. *Bodily-kinesthetic learners* experience learning best through various kinds of movement, including mimicking, dancing and role play, while *musical learners* respond to music and learn best through songs, patterns, rhythms and musical expression. *Intrapersonal learners* are reflective, analytical and intuitive about who they are and how and what they learn, whereas *interpersonal learners* like to interact with others and learn best in groups or with a partner. *Naturalist learners* love

the outdoors and enjoy classifying and categorizing activities. *Existentialist learners*, finally, are concerned with philosophical issues such as the status of mankind in relation to universal existence. In learning situations, they need to see “the big picture” in order to understand minor learning points and details. (p.5)

To make it easier to remember the characteristics of each of the nine intelligence types, Armstrong (1999) introduced the following memory tags (see **Table 2.3**):

Table 2.3 The Characteristics of Each of Gardner’s Nine Intelligence Types

Intelligence	Characteristics
Verbal/linguistic	“word smart”
Musical	“music smart”
Logical/Mathematical	“number/reasoning smart”
Spatial/visual	“picture smart”
Bodily/kinesthetic	“body smart”
Interpersonal	“people smart”
Intrapersonal	“self smart”
Natural	“nature smart”
Existential	“existence smart”

(Source: Armstrong, 1999)

2.1.1.4 Measurement—Multiple Intelligences Questionnaire

In order to implement Gardner's multiple intelligences theory in educational settings, a number of questionnaires and tools have been used for assessing various types of intelligence used in the education process. So far, the tools utilized by researchers involve the “multiple intelligence tests for children by Nancy Fairs, the multiple intelligence inventory was compiled by McKenzie in 1999, as well

as the multiple intelligence questionnaires by Harms and Douglas” (Sharifi, 2008, p.17). In 1996, Shearer developed a questionnaire to assess multiple intelligences (MI) scores of students; it is called MIDAS (Multiple Intelligences Developmental Assessment Scales). Among these tools, Shearer’s (1996) Multiple Intelligences Developmental Assessment Scales (MIDAS) and McKenzie’s (1999) Multiple Intelligences Inventory (MII) have been frequently adopted in multiple intelligences research.

2.1.1.4.1 The Multiple Intelligences Development

Assessment Scales

The Multiple Intelligences Developmental Assessment Scales (MIDAS) is a self-report instrument of intellectual disposition designed by Shearer (1996). This instrument contains 119 Likert-type items (from *a* to *f*). The questions cover eight areas of abilities, interests, skills and activities (including eight intelligences). The MIDAS provides an efficient method for obtaining a rich and descriptive understanding of a person’s multiple intelligences profile. It is a research based self-report measure of intellectual disposition for people of all ages. A number of studies on the reliability and validity of MIDAS (Shearer, 1996, 2006) have indicated that the MIDAS scales can provide a reasonable estimate of one's multiple intelligences (MI) strengths and limitations that correspond with external rating and criteria.

2.1.1.4.2 Multiple Intelligences Inventory

To identify one’s personal multiple intelligences profile, there are several checklists to choose among. One of the most well-known checklists is Walter McKenzie’s “Multiple Intelligences Inventory (MII)” (McKenzie, 1999). The MII

consists of 90 Likert-type statements which are related to the nine intelligences set forth by Gardner (1999_a, 1999_b) with an overall internal consistency of 0.85 to 0.90 (see e.g. Al-Balhan, 2006; Razmjoo, 2008; Razmjoo, et al., 2009; Hajhashemi & Wong, 2010).

In the present study, McKenzie's MII was adopted as one of the instruments to determine the Chinese English Major EFL undergraduates' MI profiles/scores. The main reason why McKenzie's MII was adopted is that one of the purposes of the study is to investigate the participants' nine intelligences, and that there is no other instrument available to do this. This is the only instrument for dealing with the nine types of intelligence.

2.1.1.5 Multiple Intelligences Theory and Second Language

Learning

The Multiple Intelligences (MI) Theory and its applications to educational settings are growing very rapidly. Since 1983, this theory has found a ready audience among educators and curriculum designers alike, and this has come as a surprise to Gardner himself (Fahim, Bagherhazemi & Alemi, 2010). "The fervor with which educators embraced his (Gardner's) premise that we have multiple intelligences surprised Gardner himself" (Checkley, 1997, p.8).

In the field of education, as far as the application of MI theory in second language acquisition (SLA) is concerned, Michael Berman (1998) was the first educator to apply Gardner's MI theory to English language teaching (ELT) (Palmberg, 2002). In Berman's book *A Multiple Intelligences Road to an ELT Classroom* (1998), he provides an outline of the theory and devotes one chapter to each intelligence to illustrate the variety of exercises/activities/tasks that can be used during EFL lessons to cater for that intelligence type in practice. He emphasizes the importance for

teachers to cater for the various intelligence profiles that exist in a language learning environment. In a subsequent book entitled *ELT through Multiple Intelligences*” (2001), advertised in the introduction as a resource book to accompany the first one, Berman (2001) elaborates the topic further, providing EFL teachers with a new selection of stimulating and challenging exercises aimed at the various intelligence types (cited in Palmberg, 2002).

In Puchata and Rinvoluceri’s book *Multiple Intelligences in EFL* (2005), they provide a concise overview of the latest research into human intelligence, and offer practical suggestions for the teaching of adolescent and adult students. They demonstrate how a language teacher can systematically activate other intelligences, in addition to the verbal-linguistic one in language lessons.

Other educators such as Armstrong (2000) began to use MI-based instructions as ways to overcome the difficulties which they encounter with their students as a result of their individual differences and their learning styles. Moreover, many teachers and educational curriculum designers have used Gardner’s MI theory in the teaching-learning processes and used it benefits. For example, McClaskey (1995) continued to use Gardner’s ideas on multiple intelligences as models for developing lessons.

2.1.1.6 Summary

As one of the learning theories, Gardner’s theory of multiple intelligences (MI) is still developing. As far as Gardner himself is concerned, he has also kept developing the theory. He has evolved the types of intelligence from seven to eight then to nine. He has also increased the criteria for judging intelligence from seven to eight. The measurement for testing an individual’s MI is different from the

purpose and participants of a study. When using it in education, especially in the EFL classroom, MI has attracted both supporters and critics since it came into being as a theory of learning.

2.1.2 Theory of Cognitive Style

2.1.2.1 The Definition of Cognitive Style

Style labels first proliferated in cognitive psychology through the term “cognitive style”. The concept was developed by cognitive psychologists conducting research into problem solving and sensory and perceptual abilities (Sternberg, 1997). To understand cognitive style, a definition of cognition must first be understood. Cognition is a collection of mental processes that includes awareness, perception, reasoning, judgment, and knowledge. Researchers, educators, and psychologists are focusing on cognitive style, a segment of cognitive performance. There is some debate as to how to define cognitive style from different perspectives.

Goldstein and Blackman (1978) define cognitive style as “a hypothetical construct that has been developed to explain the process of mediation between stimuli and responses. The term cognitive style refers to characteristic ways in which individuals conceptually organize the environment.” (p.4) Messick (1984) describes cognitive style as “consistent individual differences in preferred ways of organizing and processing information and experience” (p.5). Sternberg and Grigorenko (1997) describe cognitive styles as representing “a bridge between what might seem to be two fairly distinct areas of psychological investigation: cognition and personality” (p.701).

To date, researchers have tried to conceptualize cognitive styles in terms of three perspectives:

1. From the perspective of individual differences: Cognitive styles, viewed as consistent individual differences in preferred ways of organizing and processing information and experience (Messick, 1976), are a stable, relatively permanent disposition that reflects a person's preferences for receiving, processing, and responding to external input (Williams & Anshel, 1997). It is believed that, as a psychological disposition, cognitive styles are stable and consistent over time and across situations and domains, which include content traits (i.e., what is done) and process traits (i.e., how it is done). Content traits include traditional personality traits that are stable and enduring whereas process traits involve individual differences in the way information is processed (Gallaher, 1992).

2. From a cognitive process perspective: Cognitive styles are seen as an individual's characteristic and consistent approach to organizing and processing information (Boles & Pillay, 1999). They are seen as process variables "representing techniques for moving toward a goal, rather than competence in achieving goals" (Witkin, 1978, p. 5). From this view, cognitive styles are defined as cognition-centered tendencies that shape the way an individual organizes a learning experience (Palmquist, 2001). They indicate an individual's preferred and habitual approach to both organizing and representing information. The term reflects the way in which the individual person thinks (Riding & Rayner, 1998, p.7).

3. From a behavioral preference perspective: Cognitive styles represent "characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1979, p.75). They are defined as a disposition that describes the unique manner in which an individual perceives, processes, and

responds to external stimuli (MacGillivray, 1981). In other words, cognitive styles are taken to refer to the manner or mode of cognition and are aimed at answering the question of “how” (Brooks, Simutis, & O’Neil, 1985).

2.1.2.2 The Development of Cognitive Style

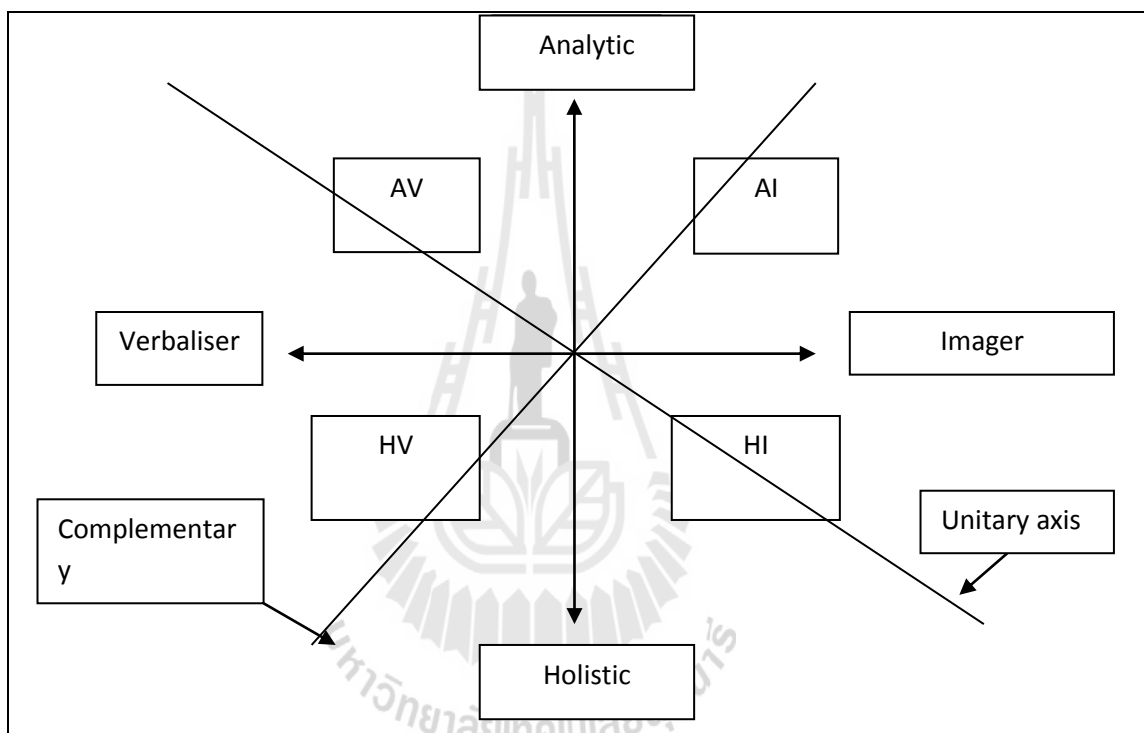
The origin of the construct of style can be traced back as far as 1937 in Allport’s book “*Personality: A Psychological Interpretation*” and the concept has evolved over time and has taken many different forms. On the basis of a review of related literature, Zhang and Sternberg (2005_b) conclude that among these works, three major integrative models of styles stand out in the process of the development of cognitive style. The first is Curry’s (1983) Three-layer “Onion” Model. The second is Riding and Cheema’s (1991) Model of Two Style Dimensions. The third is Sternberg’s theory of mental self-government.

2.1.2.2.1 The Three-layer “Onion” Model

Curry (1983) developed a three-layer “Onion” model theory that illustrates how these cognitive styles perspectives are integrated. According to the theory, the innermost layer of the model is composed of measures of personality dimensions. The middle layer comprises style measures of information processing, and the outermost layer is composed of measures addressing each individual’s instructional preferences. Curry (1983) hypothesized that the styles at the innermost layer, the personality dimensions, are the most stable ones and the styles at the outermost layers, the individual instructional preferences, are the dimensions that are most likely to be modified.

2.1.2.2.2 Model of Two Style Dimension

Riding and Cheema (1991) suggested that learners differ in terms of two fundamental and independent dimensions of cognitive style: the wholist-analytical (WA) dimension and the verbal-imager (VI) dimension (Riding, 1991) (Figure 2.1).



(Source: Sadler-Smith & Riding, 1999, p.358)

Figure 2.1 The Two Dimensions of Cognitive Style

A: Wholist-analytical dimension of cognitive style

The wholist-analytical dimension of cognitive style describes the habitual way in which an individual processes and organizes information: some individuals will process and organize information into its component parts (described as analytics); others will retain a global or overall view of information (described as wholists) (cited in Sadler-Smith & Riding, 1999, p.357). The Wholist-analytical dimension of

cognitive style involves Field Dependence-Field Independence, Impulsivity-Reflectivity, etc.

B: Verbal-imagery dimension of cognitive style

The verbal-imagery dimension of cognitive style describes an individual's habitual mode of representation they read, see or listen to, in words or verbal associations; imagers on the other hand, when they read, listen to or consider information, experience “fluent spontaneous and frequent pictorial mental pictures” (cited in Sadler-Smith & Riding, 1999, p.358).

2.1.2.2.3 Sternberg and Grigorenko's Categorization of Styles

Sternberg and Grigorenko (1995) organized all existing style labels into three distinct traditions of style-based work: a cognition-centered approach, a personality-centered approach, and an activity-centered approach (see also Sternberg, 1997). Each of the three approaches includes a few specific models/theories (see **Table 2.4**).

According to Sternberg and Grigorenko (Grigorenko & Sternberg, 1995; Sternberg, 1997), each of the three traditions to the study of styles has its own limitations (cited in He, 2006), which were presented as follows:

The cognition-centered theories of style have four shortcomings. First, they are more empirically driven than theory driven. Second, it is difficult to determine the validity of the studies because the validity of the measures is unknown. Third, to date there have been no studies that assessed cognitive styles in a natural environment. Finally, all existing studies on cognitive

styles use old style models that usually focus on styles of one dimension with two dichotomous style types, such as field-dependent or field-independent, analytic or relational, reflective or impulsive, and so on.... *The personality-centered studies of styles* also have some limitations. For example, the overall measurement models are too often incongruent with the underlying theoretical models (e.g., Jung, 1923; Myers & McCaulley, 1985; Myers & Myers, 1980). There have been no systematic studies of the relationship between similar styles originating from different theories. At the same time, the personality-centered studies of styles lacked clarity in the definition of the concept of styles. This leads to a question of domain generality and specificity. As for the limitations of *the activity-centered theories of styles*, they have no clear definition of style and say little about the development of styles. (p.26)

Table 2.4 Sternberg and Grigorenko's Categorization of Various Styles

Cognition-centered approach		
Style labels	Descriptions	References
Field-dependence-independence	Individual dependence on a perceptual field when analyzing a structure of form that is part of the field	(Witkin & Asch, 1948a, 1948b; Witkin et al., 1977; Witkin et al., 1971)
Leveling-sharpening	A tendency to assimilate detail rapidly and lose detail or emphasize detail and changes in new information.	(Gardner et al., 1959)
Impulsivity- reflectiveness	Tendency for quick as against a deliberate response.	(Kagan, 1966)
Personality-centered approach		
Style labels	Descriptions	References
Extroversion-introversion/ intuitive-sensing/thinking- feeling/perceptive-judging	Four distinctions of psychological types.	(Jung, 1923; Myers & McCaulley, 1985; Myers & Myers, 1980)
Concrete sequential/concrete random/abstract sequential/ abstract random	The learner learns through experience concrete and abstracts either randomly or sequentially.	
Activity-centered approach		
Style labels	Descriptions	References
Converging-diverging/ assimilating-accommodating	Thinking with abstract conceptualization or concrete experience	(Dunn, Dunn, & Price, 1989)
Environmental/sociological/ emotional/physical/ psychological elements	The learner's response to key stimuli: environmental (light, heat); sociological (peers, pairs, adults, self); emotional (structure, persistence, motivation); physical (auditory, visual, tactile); psychological (global-analytic, impulsive-reflective)	

Ten common weaknesses of the past style theories presented by Sternberg (1997, pp. 148-158) were as follows:

1. There is usually no unifying model or metaphor that integrated the various styles, not only between theories, but also within theories.
2. Some of the styles seem too much like abilities.
3. Some of the styles seem too much like personality traits.
4. There is no compelling demonstration of the relevance of styles in real-world settings.
5. There is insufficient connection between the theories of styles and psychological theory, in general.

6. The styles specified by the theories are sometimes simply not compelling.
7. There is insufficient use of converging operations, or multiple methods of measurement.
8. There is little or no serious research to show the usefulness of the styles.
9. The theories don't seem to be theories of styles at all, but rather of the variables that affect styles.
10. The styles specified by the theories do not meet some or even most of the criteria for style.

In order to overcome the aforementioned limitations and weaknesses, Sternberg and his colleagues proposed their theory of thinking styles: the theory of mental self-government (Sternberg, 1988, 1990, 1997).

2.1.3 Theory of Thinking Styles

2.1.3.1 Definition of Thinking Styles

Sternberg (1997) defines the term thinking styles as one's habitual patterns or preferred ways of thinking while doing something. In the field of style studies, thinking styles has become more popular after it was defined more clearly by Sternberg and his colleagues (Sternberg, 1988; Sternberg & Lubart, 1991_a, 1991_b) in the theory of thinking styles—theory of mental self-government. Before the term thinking styles was proposed, cognitive styles and learning styles were the generally preferred terms. However, Sternberg was not the first person to use the concept of thinking styles. Before that, Torrance, Reynolds, and Ball (1977) related thinking styles to the functioning of the brain's hemispheres: left-brain style and right-brain style. According to Sternberg (1988, 1997), thinking styles are related to the self-government of abilities. They are characteristic ways of thinking and preferences

about how we utilize the abilities we have. Thinking styles concern the question of how one thinks, which is different from how well one thinks. It is suggested that what happens to us in life depends not just on how well we think, but also on how we think (Sternberg, 1997).

2.1.3.2 Sternberg's Theory of Mental Self-government

Sternberg's theory of thinking styles—the theory of mental self-government— was first published in 1988. Using the word "government" metaphorically, Sternberg (1988, 1997) proposed that just as there are many ways of governing a society, there are many ways of using the abilities that we have. These different ways of using abilities can be construed as our thinking styles. In using our abilities, we choose styles with which we feel comfortable. Moreover, people use different thinking styles on the basis of the stylistic demands of a given situation. Many characteristics of thinking styles have been delineated by Sternberg (1997), among which the modifiability of thinking styles is one of the most important. Sternberg (1997) contended that thinking styles are at least partially socialized, indicating that they can be cultivated and modified.

The theory of mental self-government delineates 13 thinking styles that fall along five dimensions of mental self-government:

1. Functions: including the legislative style (LGS), the executive style (EXS), and the judicial style (JDS);
2. Forms: including the hierarchical style (HRS), the monarchic style (MNS), the oligarchic style (OLS), and the anarchic style (ANS);
3. Levels: including the global (GLS) and the local style (LCS);
4. Scopes: including the internal style (ITS) and the external style (ETS); and

5. Leanings: including the liberal style (LBS) and conservative style (CSS).

Each of the 13 styles is briefly described by Zhang (2010) in the following table (see **Table 2.5**):

Table 2.5 Thinking Styles in the Theory of Mental Self-government

Thinking style	Key characteristics
Legislative	One prefers to work on tasks that require creative strategies. To choose one's own activities.
Judicial	One prefers to work on tasks that allow for one's evaluation. To evaluate and judge the performance of other people.
Hierarchical	One prefers to distribute attention to several tasks that are prioritized according to one's valuing of the task.
Global	One prefers to pay more attention to the overall picture and issue and to abstract ideas.
Liberal	One prefers to work on tasks that involve novelty and ambiguity.
Executive	One prefers to work on tasks with clear instructions and structures. To implement tasks with established guidelines.
Monarchic	One prefers to work on tasks that allow complete focus on one thing at a time.
Local	One prefers to work on tasks that require working with concrete details.
Conservative	One prefers to work on tasks that allow one to adhere to the existing rules and procedures in performing tasks.
Oligarchic	One prefers to work on multiple tasks in the service of multiple objectives, without setting priorities.
Anarchic	One prefers to work on tasks that would allow flexibility as to what, where, when, and how one works.
Internal	One prefers to work on tasks that allow one to work as an independent unit.

External	One prefers to work on tasks that allow for collaborative ventures with other people.
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(Source: Zhang, 2010, p.602)

2.1.3.3 Zhang and Sternberg's Three-Dimensional Model of Thinking Style

The 13 thinking styles have been re-conceptualized into three types based on empirical data by Zhang and Sternberg (2005_b):

Type I thinking styles are the styles that tend to be more creativity-generating and that denote higher levels of cognitive complexity, including the legislative (being creative), judicial (evaluative of other people or products), hierarchical (prioritizing one's tasks), global (focusing on the holistic picture), and liberal (taking a new approach to tasks) styles.

Type II thinking styles are styles that suggest a norm-favoring tendency and that denote lower levels of cognitive complexity, including the executive (implementing tasks with given orders), local (focusing on details), monarchic (working on one task at a time), and conservative (using traditional approaches to tasks) styles.

The anarchic (working on whatever tasks that come along), oligarchic (working on multiple tasks with no priority), internal (working on one's own), and external (working with others) styles are Type III styles. They may manifest the characteristics of the styles from both Type I and Type II groups, depending on the stylistic demands of a specific task. For example, one could use the anarchic style in a sophisticated way (characteristic of Type I styles)—such as dealing with different tasks as they arise, but without losing one's sight of the whole picture of the central

issue. By contrast, one also could use the anarchic style in a more simple-minded way (characteristic of Type II styles)—such as dealing with tasks as they come along without knowing how each task contributes to his/her ultimate goal.

2.1.3.4 Measurement-Thinking Styles Inventory

The theory of mental self-government has been operationalized through a number of inventories, including the most frequently used Thinking Styles Inventory (Sternberg & Wagner, 1992) and the Thinking Styles in Teaching Inventory (Grigorenko & Sternberg, 1993). Internal validity of the theory has been demonstrated in many studies (e.g., Dai & Feldhusen, 1999; Zhang, 1999; Zhang & Sternberg, 1998, 2002; Bernardo, Zhang, & Callueng, 2002) conducted among students and teachers from a number of cultural groups, including in Hong Kong, mainland China, the Philippines, Spain, and the United States. External validity of the theory has been obtained by examining the nature of thinking styles not only against a number of constructs that belong to the family of intellectual styles such as Biggs's (1978) concept of learning approach (see Zhang & Sternberg, 2000) and Holland's (1973, 1994) notion of career personality types (see Zhang, 2000_b), but also against several constructs that are perceived to be significantly related to the thinking style construct, including Costa and McCrae's (1992) big five personality traits (see Zhang, 2002_a) and Perry's (1999) construct of cognitive development (see Zhang, 2002_c).

The present study adopted Sternberg and Wagner's (1992) Thinking Styles Inventory (TSI) (see **Appendix A-2**) to investigate the Chinese English Major EFL undergraduates' TS profiles/scores. The reason for this is that validity of the inventory has been demonstrated in many studies; the other is that many studies using the inventory involved undergraduate students in China.

2.1.4 Language Learning Strategies

2.1.4.1 Definitions of Language Learning Strategies

The definition of language learning strategies is not uniform. In the past 30 years, there has been no consensus on the definition of language learning strategies (LLS) due to different interpretations of strategy and learning. Different research studies have given different definitions of LLS. Some definitions of learning strategies produced by different researchers are as follows:

Stern (1983) defines LLS as "...best reserved for general tendencies or overall characteristics of the approach employed by the language learner, leaving techniques as the term to refer to particular forms of observable learning behavior, more or less consciously employed by the learner" (p.405). Weinstein, Husman and Dierking (2000) describe LLS as "thoughts, behaviors, beliefs or feelings that help learner transfer new information to other environments". Chamot (1987, pp. 71-84) states that LLS are techniques, approaches or deliberate actions that students take in order to facilitate the learning, recall of both linguistic and content area information. Rubin (1987, p. 22) states that learning strategies are strategies that contribute to the development of the language system that the learner constructs and affects learning directly. These strategies can facilitate the internalization, storage, retrieval, or use of the new language. Strategies are tools for the self-directed involvement necessary for developing communicative ability" (p.18-22). O'Malley and Chamot (1990) define LLS as "special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (p. 1). Cohen (2003) describes LLS as learning procedures used consciously by learners. Wenden (1998, p. 18) defines learning strategies as "mental steps or operations that learners use to learn a new language and

to regulate their efforts to do so.” Oxford (1999) defines LLS as certain activities, behaviors or techniques used by students to develop their skills in language learning.

On the basis of review of definitions of “learning strategies” by other researchers (e.g., Oxford, 1989; Tarone, 1980; Stern, 1983; Seliger, 1984; Cohen, 1990), Ellis (2008) concludes that learning strategies are perhaps best defined in terms of a set of characteristics that figure in most accounts of them:

- Strategies refer to both general approaches and specific actions or techniques used to learn an L2.
 - Strategies are problem-orientated the learner deploys a strategy to overcome some particular learning or communication problem.
 - Learners are generally aware of the strategies they use and can identify what they consist of if they are asked to pay attention to what they are doing/thinking
 - Strategies involve linguistic behavior (such as requesting the name of an object) and non-linguistic (such as pointing at an object so as to be told its name) behavior.
 - Linguistic strategies can be performed in the L1 and in the L2.
 - Some strategies are behavioral while others are mental. Thus some strategies are directly observable, while others are not.
 - In the main, strategies contribute indirectly to learning by providing learners with data about the L2 which they can then process. However, some strategies may also contribute directly (for example, memorization strategies directed at specific lexical items or grammatical rules).
 - Strategy use varies considerably as a result of both the kind of task the learner is engaged in and individual learner preferences.
- (pp. 704-705)

According to Ellis (2008), “a learning strategy is a device or procedure used by learners to develop their inter-languages. Learning strategies account for how learners

acquire and automatize L2 knowledge. They are also used to refer to how they develop specific skill. It is possible, therefore, to talk of both ‘language-learning strategies’ and ‘skill-learning strategies’. Learning strategies contrast with communication and production strategies, both of which account for how learners use rather than acquire L2 competence” (p. 970).

2.1.4.2 The Classification of Language Learning Strategies

Many researchers (e.g., Oxford, 1990; O’Malley & Chamot, 1990; Stoffer, 1995; Cohen, 2000) generated taxonomies of language learning strategies (LLS).

2.1.4.2.1 Classification of Language Learning Strategies by Oxford

The term most commonly used is “learning strategies”, defined as “behaviors or actions which learners use to make language learning more successful, self-directed and enjoyable” (Oxford, 1989). Oxford (1990) identifies two main types of language learning strategies, direct and indirect. Direct strategies are the strategies that directly involve the target language in the sense that they need mental processing of the language. Indirect strategies indirectly support language learning by arranging, evaluating, lowering anxiety, encouraging oneself, cooperating with others, asking questions, and other ways. The detailed Oxford’s (1990, p. 17) taxonomy of language learning strategies is shown in **Table 2.6**:

Table 2.6 Classification of Language Learning Strategies by Oxford

Strategies	Sub-strategies
<ul style="list-style-type: none"> ● Direct strategies 	<ol style="list-style-type: none"> 1. <i>Memory strategies</i> <ol style="list-style-type: none"> A. Creating mental linkages B. Applying images and sounds C. Reviewing well D. Implying action 2. <i>Cognitive strategies</i> <ol style="list-style-type: none"> A. Practicing B. Receiving and sending messages C. Analyzing and reasoning D. Creating structure for input and output 3. <i>Compensation strategies</i> <ol style="list-style-type: none"> A. Guessing intelligently B. Overcoming limitations in speaking and writing
<ul style="list-style-type: none"> ● Indirect strategies 	<ol style="list-style-type: none"> 1. <i>Meta-cognitive Strategies</i> <ol style="list-style-type: none"> A. Centering your learning B. Arranging and planning your learning C. Evaluating your learning 2. <i>Affective Strategies</i> <ol style="list-style-type: none"> A. Lowering your anxiety B. Encouraging yourself C. Taking your emotional temperature 3. <i>Social Strategies</i> <ol style="list-style-type: none"> A. Asking questions B. Cooperating with others C. Empathizing with others

As **Table 2.6** shows, direct strategies include memory, cognitive and compensation strategies. Memory strategies are those that help students to store and retrieve information. Cognitive strategies enable learners to understand and produce

new language. Compensation strategies allow learners to overcome knowledge gaps to communicate. Indirect strategies include three strategies: meta-cognitive, affective and social strategies. Meta-cognitive strategies allow learners to control their own learning through organizing, planning, and evaluating. Affective strategies help learners gain control over their emotions, attitudes, motivations, and values. Social strategies help learners interact with other people.

2.1.4.2.2 Classification of Language Learning Strategies by O'Malley and Chamot

O'Malley and Chamot (1990) have studied the use of strategies by learners of English as a second language (ESL) in the United States. Typically, strategies are divided into three main categories (see **Table 2.7**). "Metacognitive" is a term used in information-processing theory to indicate an "executive" function, strategies that involve planning for learning, thinking about the learning process as it is taking place, monitoring of one's production or comprehension, and evaluating learning after an activity is completed. "Cognitive" strategies are limited to specific learning tasks and involve more direct manipulation of the learning material itself. "Social/affective" strategies have to do with social-mediating activity and transacting with others; it will be noted that the latter categories, along with some of the other strategies listed in **Table 2.7**, are actually communication strategies. The detailed classification of O'Malley and Chamot (1990, pp.119-120) is as follows:

Table 2.7 Classification of Language Learning Strategies by O'Malley and Chamot

LEARNING STRATEGIES	DESCRIPTION
META-COGNITIVE	
Advance Organizers	Making a general but comprehensive preview of the organizing concept or principle in an anticipated learning activity
Directed Attention	Deciding in advance to attend in general to a learning task and to ignore irrelevant distracters
Selective Attention	Deciding in advance to attend specific aspects of language input or situational details that will cue the retention of language input
Self-monitoring	Planning for and rehearsing linguistic components necessary to carry out an upcoming language task.
Delayed Production	Consciously deciding to postpone speaking to learn initially through listening comprehension.
Self-evaluation	Checking the outcomes of one's own language learning against an internal measure of completeness and accuracy.
COGNITIVE	
Repetition	Imitating a language model including overt practice and silent rehearsal.
Resourcing	Defining or expanding a definition of a word or concept through use of target language reference material.
Directed Physical Response	Relating new information to physical action as with directives.
Translation	Using the first language as a base for understanding and/or producing the second language.
Grouping	Recording or reclassifying and perhaps

	labeling the material to be learned based on common attributes.
Note-making	Writing down the main idea, important points outline, or summary of information presented orally or in writing.
Deduction	Consciously applying rules to produce or understand the second language.
Imagery	Relating new information to visual concepts in memory via familiar easily retrievable visualizations, phrases or locations.
Auditory Representation	Retention of the sound or similar sound for a word, phrase or longer language sequence.
Key word	Remembering a new word in the second language by 1) identifying a familiar word in the first language that sounds like or otherwise resembles the new word and 2) generating easily recalled images of some relationship with the new word.
Contextualization	Placing a word or phrase in a meaningful language sequence.
Elaboration	Relating new information to other concepts in memory.
Transfer	Using previously acquired linguistic and/or conceptual knowledge to facilitate a new language learning task.
Inference	Using available information to guess meanings of new items predict outcome or fill in missing information.
SOCIAL/AFFECTIVE	
Cooperation	Working with one or more peers to obtain feedback, pool information or model a language

	activity.
Question for clarification	Asking a teacher or other native speaker for repetition paraphrasing, explanation and/ or examples.

2.1.4.2.3 Classification of Language Learning Strategies

by Stoffer

Another piece of research, by Stoffer (1995), showed considerable promise in providing an empirical basis for category assignment. A factor analysis of the 53 items on her vocabulary strategy survey showed they clustered into nine categories:

1. Strategies involving authentic language use
2. Strategies involving creative activities
3. Strategies used for self-motivation
4. Strategies used to create mental linkages
5. Memory strategies
6. Visual/auditory strategies
7. Strategies involving physical action
8. Strategies used to overcome anxiety
9. Strategies used to organize words

Table 2.8 presents the detailed classification of Stoffers' (1995) classification of vocabulary learning strategies:

Table 2.8 Classification of Vocabulary Learning Strategies by Stoffer

Strategies	Descriptions
1. Strategies involving authentic language use	Creating one's own practice opportunities by reading newspapers, magazines, literature, and poetry in the foreign language, watching foreign language movies, listening to L2 radio programs, and practicing the language in real and imagined conversations with a native speaker.
2. Strategies involving creative activities	These activities may involve body movement, as pantomimes, and gestures, physically acting out new words, or using color-coded flashcards, as well as creative activities, e.g., writing poetry in the foreign language. The ones who use this strategy tend to make use of modern technology to study the L2, like computers, or tape and video recorders.
3. Strategies used for self-motivation	Combining a number of affective strategies, the most prevalent one being just enjoying the activity of vocabulary learning. Further strategies are feeling successful when learning new words, encouraging oneself, or trying to relax when one is afraid of using a certain word. Additionally, learners who employ monitoring, such as paying attention, and being aware of the incorrect use of a words, have proven to be successful language learners.
4. Strategies used to create mental linkages	Linking L2 words to one's native language (either by sound or spelling), learning words from related topics at the same time, linking new words to already known concepts, or to themselves, or using natural associations.

5. Memory strategies	Using flashcards when learning new words, repeating the new material, (either in writing or orally), quizzing oneself or being quizzed by others, reviewing frequently, and concentrating on the task.
6. Visual/Auditory strategies	Arranging words on a page to form pattern, drawing pictures of new words, or using color-coded flashcards, as well as the use of auditory strategies, e.g., using songs or rhymes to remember new words or grammar paradigms.
7. Strategies involving physical action	Including strategies that would be preferred by kinesthetic learners. These learners enjoy practicing vocabulary by employing drama-related activities like pantomime, and gestures, or physically acting out new words, as well as manipulating real life objects, and drawing pictures of new words.
8. Strategies used to overcome anxiety	Consisting of affective strategies (very much like 3. <i>Strategies used for self-motivation</i>). Language learning anxiety has been recognized as a crucial element in the acquisition of a second language. Thus, it is very important to notice when one is tense or nervous, to be able to relax when one is afraid of using a word, and to encourage oneself even in the light of possible mistakes.
9. Strategies used to organize words	Consisting of grouping strategies, e.g., grouping vocabulary by grammatical class, or by topic with analytical strategies, like breaking lists into smaller parts, and dissecting words by identifying its prefixes, and root.

2.1.4.2.4 Classification of Language Learning Strategies by Cohen

According to Cohen (2002, p.1), language learning strategies include strategies for identifying the material that needs to be learned, distinguishing

it from other material, grouping it for easier learning (e.g., vocabulary into nouns, verbs, adjectives, adverbs), repeatedly engaging oneself in contact with the material (e.g., through classroom tasks or the completion of homework assignments), and memorizing the material when not acquired naturally (whether through rote memory techniques such as repetition, the use of mnemonics, or some other memory technique).

2.1.4.2.5 The Classification of Language Learning

Strategies in China

Research into language learning strategies (LLS) is also studied by many researchers in the mainland of China.

Wen (1996) divides LLS into two main classes: management strategies and language learning strategies. Cheng and Zheng (2002, pp. 33-35) divide LLS into four classes: cognitive, metacognitive, affective, and communicative strategies. The New English Curriculum (NEC), which is a new nation-wide curriculum (English language benchmarks) for English teaching and learning in China, divides English LLS into cognitive strategies, control strategies, communicative strategies, and resource strategies, etc. (MOE 2003). Cognitive strategies refer to the approaches and methods which learners use to perform specific learning tasks. Control strategies refer to the strategies which learners use to plan, implement, evaluate and adjust their learning process and/or learning result(s). Communicative strategies refer to the strategies which learners make good use of opportunities to communicate, maintain and improve communicative competence. Resource strategies refer to strategies that English learners effectively use different media to learning and use English language.

When compared, it can be seen that these taxonomies have many similarities. Ellis (2008) concludes that two of the most commonly cited taxonomies are O'Malley and Chamot (1990) and Oxford (1990) (p.705). Their taxonomies are presented in **Table 2.9**.

What **Table 2.9** presents is the taxonomies of learning strategies by O'Malley and Chamot (1990) and Oxford (1990). O'Malley and Chamot's (1990) taxonomy is based on a three-way distinction between cognitive strategies, metacognitive strategies, and social-affective learning strategies (also see Table 2.7). Oxford's (1990) taxonomy is hierarchical, with a general distinction made between direct and indirect strategies, each of which is then broken down into a number of subcategories.

Table 2.9 Two Taxonomies of Language Learning Strategies

O'Malley and Chamot (1990)	Oxford (1990)
	A Direct
A <u>Metacognitive strategies</u> , e.g. "selective attention"(deciding in advance to attend to specific aspects of language input)	1 Memory strategies, e.g. "grouping" (classifying or reclassifying materials into meaningful units)
B <u>Cognitive strategies</u> , e.g. "inferencing" (using available information to guess meanings of new items, predict outcomes, or fill in missing information)	2 Cognitive strategies, e.g. "practicing" (repeating, formally practicing, recognizing and using formulas, recombining, and practicing naturalistically)
C <u>Social/affective strategies</u> , e.g. "question for clarification" (asking a teacher or another native speaker for repetition, paraphrasing, explanation and/or examples)	3 Compensation strategies, e.g. "switching to mother tongue"
	B Indirect
	1 Metacognitive strategies, e.g. "setting goals and objectives"
	2 Affective strategies, e.g. "taking risks wisely"
	3 Social strategies, e.g. "asking for clarification or verification"

(Source: Ellis, 2008, p.707)

In conclusion, the effort of developing taxonomies of language strategies has been continuous. As Oxford (1990) pointed out, “Strategy research is in its infancy and so categories are still fluid and open to debate” (pp.16-22).

2.1.5 Reading Strategies in a Foreign/Second Language Learning

Reading is the most fundamental tool for EFL learners. Learning and implementing special reading strategies and specializing in the implementation of such strategies enable not only a more efficient use of time but also an easier and more sustained period of reading (Sen, 2009). In order to achieve comprehension, readers must employ appropriate reading strategies to assist them in understanding reading materials (Zhang & Pan, 2010).

2.1.5.1 Definition of Reading Strategies

As an important part of language learning strategies (LLS), many researchers have already given definitions of reading strategies. Olshavsky (1977) claims that a strategy is a purposeful means of comprehending the author’s message. Pritchard (1990) defines a strategy as a deliberate action that readers take voluntarily to develop an understanding of what they read. Urquhart and Weir (1998) report that strategies can be regarded as the ways of getting round difficulties encountered while reading. Routman (2003) defines reading comprehension strategies as “tools or plans for facilitating and extending comprehension” (cited in Cogmen & Saracaloglu, 2009). From all the definitions, it can be concluded that a reading strategy is “a purposeful approach with which the reader who is involved in a reading activity solves the difficulties in the reading comprehension process” (Zhang & Pan, 2010).

2.1.5.2 Classifications of Reading Strategies

The classification of reading strategies (RS) is developed from the classification of the general language learning strategies (LLS). As mentioned in 2.1.4.2.5 above, the taxonomies of reading strategies by O'Malley & Chamot (1990) and Oxford (1990) are also two of the most commonly cited ones.

Another taxonomy of reading strategies is for metacognitive reading strategies classified by Sheorey and Mokhtar (2001). They classify metacognitive reading strategies into three categories: metacognitive strategies, cognitive strategies, and support strategies. Metacognitive strategies are those intentionally, carefully planned techniques by which learners monitor or manage their reading. Such strategies include having a purpose in mind, previewing the text as to its length and organization, or using typographical aids and tables and figures; Cognitive strategies are the actions and procedures readers use while working directly with the text. These are localized, focused techniques used when problems develop in understanding textual information. Examples of cognitive strategies include adjusting one's speed of reading when the material becomes difficult or easy, guessing the meaning of unknown words, and re-reading the text for improved comprehension. Support strategies are basically support mechanisms intended to aid the reader in comprehending the text such as using a dictionary, taking notes, or underlining or highlighting the text to better comprehend it.

The taxonomies of reading strategies used in the present study are based on O'Malley and Chamot's (1990) and Oxford's (1990) taxonomies which involve only four categories: cognitive strategies (CGS), metacognitive strategies (MTS), compensation strategies (CPS), and social strategies (SCS). The reason for this is that

there is some overlap between the two taxonomies. Moreover, the sub-category affective strategies in Oxford's (1990) is for general language learning and memory strategies is one of the subcategories of cognitive strategies in O'Malley and Chamot's (1990) taxonomy.

2.1.5.3 Reading Strategies Questionnaire

There are several versions of the Strategy Inventory for Language Learning (SILL) developed by researchers. So far, Oxford's (1990) SILL (the Strategy Inventory for Language Learning), Sheorey and Mokhtari's (2001) SORS (the Survey of Reading Strategies), and Cohen and Chi's (2001) LSS (the Language Strategy Survey) are regarded as the three most frequently adopted and/or adapted ones.

2.1.5.3.1 The Strategy Inventory for Language Learning by Oxford

The Strategy Inventory for Language Learning (SILL) developed by Oxford (1990) consists of direct and indirect learning strategies with 50 items altogether. The SILL includes six sub-categories of strategies: memory strategies (9 items), cognitive strategies (14 items), compensation strategies (6 items), metacognitive strategies (9 items), affective strategies (6 items), and social strategies (6 items).

The SILL has been used worldwide to investigate L2 learners' overall learning strategy use, factors underlying strategy choice, relationship between strategy use and L2 performance, and strategy training (Nyikos & Oxford, 1993; Green & Oxford, 1995; Park, 1997; Yang, 1999; Wharton, 2000; Griffiths, 2003; Nisbet et al., 2005; Riazi & Rahimi, 2005; Hong-Nam & Leavell, 2006; McMullen, 2009). The internal consistency reliability of the SILL determined by Cronbach's alpha has been well above an acceptable alpha value of .60 or .70 in most studies

(Hair et al., 1998; Landau & Everitt, 2004). For instance, the Alpha coefficients have been .94 with the Chinese translation version (Yang, 1999; Hsiao & Oxford, 2002), .93 with the Korean and Japanese translation version (Park, 1997; Robson & Midorikawa, 2001), .86 for the Arabic translation version (Khalil, 2005), and from .67 to .96 for the English version (Nyikos & Oxford, 1993; Wharton, 2000; Hong-Nam & Leavell, 2006).

2.1.5.3.2 The Survey of Reading Strategies by Sheorey and Mokhtaris

The Survey of Reading Strategies (SORS) was developed by Sheorey and Mokhtaris (2001). The SORS consists of 28 items that measure three broad categories of reading strategies, namely, metacognitive strategies (10 items), cognitive strategies (12 items), and support strategies (6 items).

2.1.5.3.3 The Language Strategy Survey by Cohen and Chi

The Language Strategy Survey (LSS) was developed by Cohen and Chi (2001). Unlike other taxonomies, the 89 items in this questionnaire are constructed around the traditional distinction between skills (listening, speaking, reading, and writing) and two other aspects (vocabulary and translation). It was especially designed as a basis for strategy training in students preparing for a study-abroad period (Ellis, 2008, p. 706). As for the Reading Strategy Use in the LSS, it consists of two parts with 12 items, namely, strategies to improve one's reading ability (9 items) and strategies for when words and grammatical structures are not understood (3 items).

In summary, different questionnaires were invented from different taxonomies of language learning strategies. It could be concluded that the

inventory of language learning strategies is not a static, but a dynamic one. “It (the taxonomy of learning strategies) should not be viewed as exhaustive, but rather as a dynamic working inventory which suggests the major strategies” (Schmitt, 1997).

2.1.6 Teaching Syllabus for English Majors and the Test for English Majors Grade Four in China

At universities, each major has its own teaching syllabus for teachers. With regard to English majors, there is a national *Teaching Syllabus for English Majors* (TSE) which was compiled by the Higher Education Institution Foreign Language Teaching Supervisory Committee English Group (HFSG) in 2000. According to TSE, the students must register for all the courses required during eight academic terms in four years. In the Chinese educational system, there are two terms in each academic year. As English major students, they are required to take and pass the Test for English Majors Grade Four (TEM-4) in April within the first three academic years, which is one of the important qualifications for graduation.

2.2 Previous Research Studies into Multiple Intelligences, Thinking Styles, and Reading Strategies

There are numerous studies on multiple intelligences and reading strategies. The reviews which follow are only related to the research questions in the present study.

2.2.1 Interrelationship between Multiple Intelligences, Thinking Styles, and Reading Performance/Achievement

Very few studies into the relationship between multiple intelligences and thinking styles, thinking styles and reading strategies can be found in the literature so

far. The following table (see **Table 2.10**) summarizes a selection of five previous studies on the relationship between multiple intelligences and reading strategies.

Table 2.10 Selected Previous Studies into Multiple Intelligences and Reading Strategies/Language Learning Strategies

Akbari, R., and Hosseini, K. (2008). Multiple intelligences and language learning strategies: investigating possible relations	
Purpose(s)	-to investigate the existence of any possible relationship between the use of language learning strategies and multiple intelligences' scores of foreign language learners of English
Participants	-Ninety English major university students at BA and graduates levels
Instruments	Shearer's (1996) MIDAS (Multiple Intelligences Developmental Assessment Scales); Oxford's (1990) SILL (Strategy Inventory for Language Learning); IELTS (retired)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. There were significant relations between the use of language learning strategies and IQ scores of the learners. 2. Musical intelligence did not correlate with any aspect of strategy use, and kinesthetic intelligence correlated only with memory learning strategies.
Hajhashemi, K., Ghombavani, F. P., and Amirkhiz, S. Y. Y. (2011). The relationship between Iranian EFL high school students' multiple intelligence scores and their use of learning strategies	
Purpose(s)	-to find out the relationship between the MI profiles and language learning strategies used by Iranian EFL high school students
Participants	Two hundred and twenty-nine students (121 males, 108 females)
Instruments	McKenzie's (1999) MII (Multiple Intelligences Inventory); Oxford's (1990) SILL

Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. There is a low, positive correlation between the two variables of MI and learning strategies. 2. There is a low, positive correlation between MI and different strategy types. 3. The highest correlation was seen between meta-cognitive strategies and MI, followed by compensation and cognitive strategies. 4. Iranian students mostly use meta-cognitive strategies followed by social strategies.
Arani, H. K., and Mobarakeh, S. D. (2012). Metacognitive strategies and logical/mathematical intelligence in EFL context: investigating possible relationships	
Purpose(s)	-to investigate the possible relationship between logical/mathematical intelligence and metacognitive strategies Iranian EFL learners used in their reading comprehension process
Participants	Ninety-eight EFL learners (55 females and 43 males) of English at Tarbiat Moallem University
Instruments	Shearea's (1996) MIDAS; MASRI (Metacognitive Awareness of Reading Strategies Inventory)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; T-test
Findings/Results	<ol style="list-style-type: none"> 1. Logical/mathematical intelligence had a significant relationship with metacognitive strategies in EFL context. 2. Males and females, except for logical/mathematical intelligence usage, didn't have any significant difference in the application of metacognitive strategies.
Rahimi, M., Mirzaei, A., and Heidari, N. (2012). How do successful EFL readers bridge between multiple intelligences and reading strategies?	

Purpose(s)	-to investigate the role of successful Iranian L2 readers' multiple intelligences in their effective use of reading strategies.
Participants	135 graduate and undergraduate students at several different universities in Isfahan and Shahrekord
Instruments	McKenzie's (1999) MII; Reading Comprehension Test (RCT)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. A significant positive relationship between linguistic, logical/mathematical, spatial/visual, interpersonal, intrapersonal and reading strategy use in general, and metacognitive and cognitive strategy use in particular. 2. A positive relationship was also found between logical and memory strategy, interpersonal and compensation and social strategy use.
Li, B. and Wang, S.Q. (2012). Relationship of multiple intelligences, learning strategies, and English proficiency	
Purpose(s)	-to examine the relationship between multiple intelligences and language learning strategies
Participants	111 undergraduate students majoring in English at Tianjin Foreign Studies University
Instruments	McKenzie's (1999) MII; Oxford's (1990) SILL; TEM-4 (Test for English Majors—Grade Four)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. A significant positive correlation was found between multiple intelligences and language learning strategies. 2. The overall scores of participants' multiple intelligences and language learning strategies were not correlated with their language proficiency. 3. Linguistic intelligence, metacognitive and social strategies were found positively correlated with participants' language proficiency.

From this table, it can be concluded that:

1. All the studies show that there are significantly positive relationships between multiple intelligences (MI) and reading strategies (RS)/language learning strategies (LLS). However, more studies focus on LLS in general. There is only one study focusing on RS (Arani & Mobarakeh, 2012). Metacognitive strategies (MTS) have the strongest positive correlation to MI (Hajhashemi, at el., 2011; Rahimi, at el., 2012).

2. The data collection methods all include the Multiple Intelligences Inventory (MII)/the Multiple Intelligences Developmental Assessment Scales (MIDAS) and the Strategy Inventory for Language Learning (SILL)/ the Reading Strategies Questionnaires (RSQ). The use of MII or MIDAS depends on the purpose of the studies because they focus on different types of MI. MII is for nine-type MI and MIDAS is for eight-type MI. Furthermore, MIDAS is a commercial product so that MII is more frequently adopted by researchers.

3. Data analysis methods employed in the previous studies all involved Descriptive Statistics and the use of the Pearson Correlation Coefficient to test multiple intelligences and reading strategies/language learning strategies.

4. Only one study (Li & Wang, 2012) was conducted in China, and the other four studies were conducted in the context of Iran, which is not a global context.

2.2.2 Relationship between Multiple Intelligences/Thinking

Styles/Reading Strategies and Academic Performance

2.2.2.1 Relationship between Multiple Intelligences and Academic Performance

In the past few years, research studies into multiple intelligences (MI) and academic performance (AP) for EFL learners have brought increasing attention to

English language teaching among educators and scholars. The following table presents ten selected representative research articles by different researchers from different countries written in the last few years.

Table 2.11 Selected Previous Studies into the Relationship between MI and AP

McMahon, S. D., Rose, Dale. S., and Parks, M. (2004). Multiple intelligences and reading achievement: An examination of the Teele Inventory of Multiple Intelligences	
Purpose(s)	-to evaluate the reliability of the Teele Inventory of Multiple Intelligences (TIMI) and the relationship between intellectual preferences and reading achievement
Participants	288 American urban 4th grade students
Instruments	TIMI (Teele Inventory of Multiple Intelligences); RCT (Reading Comprehension Test)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. The TIMI subscales, which examine preferences for linguistic, logical-mathematical, interpersonal, intrapersonal, musical, spatial, and bodily-kinesthetic intelligences, were found to have poor to moderate reliability. 2. Students with higher scores on logical-mathematical intelligence were more likely to demonstrate at or above grade-level reading comprehension scores compared with students who scored lower on logical-mathematical intelligence 3. None of the other multiple intelligence scales was predictive of student achievement.
Razmjoo, S.A. (2008). On the relationship between multiple intelligences and language proficiency	
Purpose(s)	-to investigate the relationship between multiple intelligences and language proficiency

	<p>-to explore whether one of the intelligence types or a combination of intelligences are predictors of language proficiency</p> <p>-to investigate the effect of gender on language proficiency and types of intelligences</p>
Participants	278 Iranian PhD candidates who participated in Shiraz University PhD Entrance Exam
Instruments	McKenzie's (1999) MII; EPT (English Proficiency Test)
Data Analysis Method(s)	Descriptive Statistics; T-test; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	<ol style="list-style-type: none"> 1. There was not a significant relationship between language proficiency and the combination of intelligences in general and the types of intelligences in particular. 2. No significant difference was found between male and female participants regarding language proficiency and types of intelligences. 3. None of the intelligence types was diagnosed as the predictor for language proficiency. 4. No significant relationship was found between multiple intelligences and English language proficiency in the Iranian context.
Motallebzadeh, K., and Manouchehri, M. (2009). On the relationship between multiple intelligences and International English Language Testing System (IELTS) Reading scores of Iranian learners	
Purpose(s)	-to find the relationship between multiple intelligences and Iranian EFL learners' scores in reading section of IELTS
Participants	Ninety-eight Iranian IELTS candidates
Instruments	McKenzie's (1999) MII; RCT section of EELTS
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	1. No significant relationship between multiple intelligences

	<p>profiles and reading comprehension section of IELTS, except for logical-mathematical intelligence which showed a positive relation with reading scores ($P < 0.05$).</p> <p>2. Reading comprehension section in IELTS is related to Iranian learners' logical mathematical intelligence; it seems reading section contains logical tasks which could be due to the similar nature of this type of intelligence and the operations needed while reading.</p> <p>3.</p>
Fahim, M., Bagherkazemi, M., and Alemi, M. (2010). The relationship between test takers' multiple intelligences and their performance on the reading sections of TOEFL and IELTS	
Purpose(s)	-to investigate the relationship between the MI of test takers and their score on the reading section of TOEFL and IELTS
Participants	163 Iranian EFL learners(68 male and 95 female) at a private English language institute in Iran, namely Kish
Instruments	Shearer's (1996) MIDAS; The reading section of general training IELTS; The reading section of paper-based TOEFL
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	<p>1. The bias detection for the reading section of TOEFL was found to correlate positively with linguistic and logical/mathematic intelligences.</p> <p>2. The reading section of IELTS proved biased toward linguistic and spatial/visual intelligences.</p>
Hashemi, A. (2010). On the Relationship between multiple intelligences and reading comprehension tasks: An authentic MI theory-based assessment	
Purpose(s)	- to determine the relationship between reading ability and undergraduate English major students' multiple intelligences profiles
Participants	122 Iranian undergraduate EFL students from Islamic Azad

	University, Roudehen Branch
Instruments	McKenzie's (1999) MII; The reading section of IELTS (2002)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	Kinesthetic and verbal intelligence make the greatest contribution toward predicting reading ability scores.
Hou, Y.A. (2010). Multiple intelligences and foreign language learning: a case study in Taiwan	
Purpose(s)	-to investigate the role of multiple intelligences in foreign language learning behavior and performance
Participants	2545 Taiwanese EFL college students in a private five-year college in south Taiwan (975 males, 1570 females)
Instruments	EPT (listening and reading section); Questionnaires including Gardner's (1985) Motivation/Attitudes, Gardner' (1993) Multiple Intelligences, Horwitz's (1988) Beliefs about Language Learning Inventory, Horwitz, et al.(1986) Foreign Language Classroom Anxiety Scale, Oxford's (1990) Strategy of Foreign Language Learning, and Reid's (1984) Preferred Learning Styles
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; T-test; Multiple Regression Analysis
Findings/Results	MI do relate to students' learning behavior and affect their English performance to some extent.
Naeini, M.B., and Pandian, A. (2010). On the relationship of multiple intelligences with listening proficiency and attitudes among Iranian TEFL university students	
Purpose(s)	-to investigate the relationship of multiple intelligences with listening comprehension
Participants	Sixty university students majoring in TEFL at Islamic Azad University

Instruments	McKenzie's (1999) MII; The listening section of a retired TOEFL
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. No significant relationship between the score of listening and any of the multiple intelligences (MI). 2. No significant difference between MI and attitudes.
Ghazi, S. R., Shahzada, G., Gilan, U. S., Shabbir, M. N., and Rashid, M. (2011). Relationship between students' self-perceived multiple intelligences and their academic achievement	
Purpose(s)	-to investigate the relationship between multiple intelligences (MI) and academic achievement
Participants	714 students from 10 government degree colleges in district Bannu, Pakistan
Instruments	Armstrong' (1994) MII; Academic Achievements Test
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. A significant correlation was found between self-perceived linguistic, logical/mathematic, interpersonal, intrapersonal, naturalistic styles and students' academic achievements. 2. No significant correlation between self-perceived musical intelligence and academic achievement. 3. The relationship between self-perceived bodily/kinesthetic intelligence and academic achievement was very weak.
Ahmadian M, and Jalilian V, (2012). A study of relationship between Iranian EFL learners' spatial intelligence and their performance on analytical and perceptual cloze tests	
Purpose(s)	-to investigate the relationship between L2 learners' MI and their writing performance.

Participants	Thirty-three female homogeneous Persian speaking English major EFL learners at Elmi Karbordi Institute
Instruments	Shearer's (1996) MIDAS; Writing Tasks
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	<ol style="list-style-type: none"> 1. A significant relationship was found between participants' multiple intelligences (MI) and their performance on writing 2. Among all eight intelligences, linguistic intelligence (LGI) is the best predictor of writing performance.
Hajhashemi, K., and Eng, W. B. (2012). MI as Predictor of Students' Performance in Reading Competency	
Purpose(s)	<ul style="list-style-type: none"> -to examine whether performance in multiple intelligence (MI) could predict the performance in reading competency -to identify the components of MI which are correlated with the reading test scores -to determine the relationship between the multiple intelligences and reading proficiency.
Participants	128 pre-university students studying in Tehran
Instruments	Reading section of a retrieved paper-based TOEFL tests; McKenzie's (1999) MII
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	<ol style="list-style-type: none"> 1. No significant relationship between the two variables of MI and reading scores of the students. 2. There was a low significant, negative relationship between musical-rhythmic intelligence and reading which suggests that when the reading score of a student increases, musical-rhythmic intelligence of the same student decreases and vice versa. 3. Overall, three categories of MI (musical-rhythmic, verbal-linguistic, bodily-kinesthetic) were found to be predictive of reading proficiency.

Table 2.11 can be summarized as follows:

1. The purposes of the studies are more or less related to the relationship

between multiple intelligences (MI) and academic performance (AP). Most studies focus only on learners' general English language proficiency levels and language performance. Only four specify reading comprehension or reading performance (McMahon, Rose, & Parks, 2004; Motallebzadeh & Manouchehri, 2009; Fahim et al., 2010; Hashemi, 2010).

2. With regard to the participants, all are undergraduates or upper level students in Iran, Malaysia, Pakistan, and Taiwan, China.

3. Considering research instruments, as mentioned above, McKenzie's (1999) MII (the Multiple Intelligences Inventory) is popular among researchers (Razmjoo, 2008; Motallebzadeh & Manouchehri, 2009; Hashemi, 2010; Naeini & Pandian, 2010; Hajhashemi & Eng, 2012) because it is available online at no cost. In the above research, EPT (English Proficiency Test), RCT (Reading Comprehension Tests) or the reading section of a retired IELTS and TOFEL were employed to evaluate learners' English proficiency or reading performance/proficiency.

4. Regarding data analysis methods, Descriptive Statistics, Pearson Correlation Coefficient, and Multiple Regression Analysis were utilized by most of the researchers for the purposes of their studies.

5. As for the findings from these studies, significant correlations were found between some of the nine participants' self-perceived MI (e.g., Bodily/Kinesthetic and linguistic intelligence) and their academic performance to some extent, and no correlations were found with other intelligences (e.g., musical intelligence). Among the nine intelligences, Bodily/kinesthetic and linguistic intelligence make the greatest contribution toward predicting reading ability scores (Hashemi, 2010), and linguistic intelligence is the best predictor of writing performance (Ahmadian & Hosseini,

2012). As for the skills, however, no significant correlation (or only very weak correlation) was found between MI and listening.

6. In terms of gender, there was no significant difference between male and female participants (Razmjoo, 2008).

2.2.2.2 Relationship between Thinking Styles and Academic

Performance

As mentioned in 1.1 above, to investigate the contributions of thinking styles to language education, a series of studies have been conducted by a few researchers in five cultural groups: Hong Kong, mainland China, the Philippines, Spain, and the United States. However, not many research articles could be found on the relationship between thinking styles and academic performance. **Table 2.12** presents a summary of some representative studies into the relationship between thinking styles (TS) and academic performances (AP) by different researchers in different countries and areas.

Table 2.12 Selected Previous Studies into Thinking Styles and Academic Performance

Bernardo, A. B. I, Zhang, L. F., and Callueng, C. M. (2002). Thinking styles and academic achievement among Filipino students	
Purpose(s)	-to determine whether the precepts of Sternberg's (1988, 1997) theory of mental self-government apply to a non-Western culture
Participants	429 freshman students at De La Salle University, Manila, Philippines
Instruments	Sternberg and Wagner's (1992) TSI (the Thinking Styles Inventory); GPA Scores
Data Analysis	Factor analysis

Method(s)	
Findings/Results	<ol style="list-style-type: none"> 1. Thinking styles (TS) are related to academic performance. 2. The results are explained with respect to the concepts and practices of Philippine culture and schools and discussed in relation to the developmental assumptions of the theory of mental self-government.
Zhang, L. F. (2004b). Revisiting the predictive power of thinking styles for academic performance	
Purpose(s)	-to examine the contributions of thinking styles (TS) to academic achievement
Participants	250 secondary school students in Hong Kong (131 from a Catholic boys' school and 119 from a Protestant girls' school)
Instruments	Sternberg and Wagner's (1992) TSI; Sternberg's (1993) STAT (Sternberg Triarchic Abilities Test)
Data Analysis Method(s)	Reliability Analysis; Multiple Regression Analysis
Findings/Results	<ol style="list-style-type: none"> 1. The use of the hierarchical style (HRS) significantly contributed to better achievement in the social sciences and humanities and that the use of the judicial style (JDS) uniquely contributed to better achievement in the natural sciences. 2. The use of the monarchic style (MNS) significantly predicted students' achievement in design and technology. 3. TS should be taken into account in school settings and the TS that generate creativity should be cultivated in students.
He, Y. (2006). The roles of thinking styles in learning and achievement among Chinese university students	
Purpose(s)	-to examines the roles of thinking styles (TS) in learning and achievement among Chinese university students.
Participants	504 students of all four academic years and 10 teachers
Instruments	Sternberg and Wagner's (1992) TSI; Achievement Tests

Data Analysis Method(s)	Reliability Analysis; Multiple Regression Analysis
Findings/Results	The result predicted significant relationships of student achievement with TS.
Zhang, L. F. (2006b). Does student-teacher thinking match/mismatch matter in students' achievement?	
Purpose(s)	-to investigate whether the relationships of student–teacher style match (or not) students' academic achievement.
Participants	135 students and five teachers from three academic disciplines (mathematics, physics, and public administration) in Shanghai, P.R. China
Instruments	Sternberg and Wagner's (1992) TSI; Grigorenko and Sternberg's (1993) TSTI (the Thinking Styles in Teaching Inventory); Achievement Test
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. The effects of style match/mismatch upon students' achievement vary as a function of academic discipline and subject matter. 2. The statistical procedures used to analyze the data play an important role in the relationships under investigation. 3. Students' self-rated abilities make a difference in the tested relationships.
Albaili, M. A. (2007). Differences in thinking styles among low-, average-,and high-achieving college students	
Purpose(s)	-to examine the differences in thinking styles among low-, average-, and high-achieving United Arab Emirates college students
Participants	228 undergraduate students at United Arab Emirates University
Instruments	Sternberg and Wagner's (1992) TSI
Data Analysis	Analysis of variance (ANOVA); Multiple Regression Analysis

Method(s)	
Findings/Results	<ol style="list-style-type: none"> 1. Low-achieving students scored significantly lower on Executive, Hierarchical, Anarchic, Local, Conservative, and Internal styles. 2. Low-achieving students scored significantly higher on Legislative, Oligarchic, and Liberal styles. 3. Executive and Conservative styles were the most discriminating factors that separated low-achieving students from their high-achieving peers.

It can be concluded from the table that:

1. All studies excepting Zhang's (2004) listed in the table above were performed in university and/or colleges in Asian contexts.
2. The purposes of the research studies were more or less to investigate the relationship between participants' scores on thinking styles and their academic performance.
3. Sternberg and Wagner's (1992) Thinking Styles Inventory and related tests were used in all the research studies. The tests involved achievement tests (Albaili, 2007; He, 2006; Zhang, 2004, 2006_b) and GPA scores (Bernardo, Zhang, & Callueg, 2002).
4. From the findings of the research studies, it could be concluded that some of the thinking styles (TS) were related to academic performance (e.g., in the social sciences and humanities). However, no research studies were found relating to academic performance on reading.

2.2.2.3 Relationship between Reading Strategies and Reading Performances

In the literature, there are numerous research studies showing the relationships between language learning strategy usage and language achievement (El-Dip, 2004; Gan, Humpreys, & Hamp-Lyons, 2004; Ian & Oxford, 2003; Oxford, Cho, Leung, & Kim, 2004; Wharton, 2000; Mori, 2007; Riazi & Rahimi, 2005; Yalcm, 2006; Yang, 2003). In order to maintain the focus of the present study, only the relationship between reading strategies (RS) and reading performance (RP) will be reviewed. **Table 2.13** provides a brief summary of the previous studies on the relationship between reading strategies (RS) and reading performance (RP) by different researchers in different countries and areas.

Table 2.13 Selected Previous Studies into Reading Strategies and Reading Performance

Carrell, P. L. (1989). Metacognitive awareness and second language reading	
Purpose(s)	- to examine the metacognitive awareness and L2 reading
Participants	75 native English speakers learning Spanish in first, second, and third year courses and 45 native speakers of Spanish in intermediate ESL courses
Instruments	Reading Strategy use Questionnaires; Multiple Choice Comprehension Questions
Data Analysis Method(s)	Descriptive Statistics; T-tests
Findings/Results	<ol style="list-style-type: none"> 1. Spanish as a foreign language group at lower proficiency levels used more bottom-up processing strategies. 2. ESL group at advanced levels used top-down strategies.

Anderson, N. J. (1991). Individual differences in strategy use in second language reading and testing	
Purpose(s)	- to examine individual differences in strategy use by adult ESL learners engaged in two reading tasks: taking a standardized reading comprehension test and reading academic tests
Participants	Twenty-six Spanish speaking adult ESL
Instruments	DTLS (Descriptive Test of Language Skills RCT); TRP (Textbook Reading Profile)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. Students who used more strategies comprehended better. 2. No significant relationship between the amount of unique strategies and comprehension.
Block, E. (1992). See how they read: Comprehension monitoring of L1 and L2 readers	
Purpose(s)	- to illustrate the comprehension-monitoring process used by L1 and L2 readers of English as they read expository prose
Participants	Twenty-five college freshmen (16 proficient readers of English, 9 non-proficient readers of English)
Instruments	Think Aloud
Data Analysis Method(s)	Descriptive Statistics
Findings/Results	<ol style="list-style-type: none"> 1. Less proficient readers used local strategies. 2. More proficient readers relied on global strategies.
Brantmeier, C. (2000). The relationship between readers' gender, passage content, comprehension and strategy use in reading Spanish as a second language	
Purpose(s)	-to investigate the relationship between readers' gender, passage content, comprehension and strategy use in reading Spanish as a second language
Participants	Seventy-eight native English readers of Spanish (29 men and 49

	women) from an intermediate level Hispanic culture course
Instruments	Reading Strategy Use Questionnaire; Written Recall Comprehension Tasks
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; T-tests
Findings/Results	<ol style="list-style-type: none"> 1. Males and females use almost the same number of global and local strategies. 2. There is a gender-related difference in reading comprehension, but no gender-related difference in strategic behavior.
Sen, H. S. (2009). The relationship between the use of metacognitive strategies and reading comprehension	
Purpose(s)	-to detect the differences (in terms of finding the main idea, guessing the end of the text, achievement scores) between the reading comprehension skills of students who learnt how to use metacognitive strategies (MTS) and those who continued using traditional educational methods
Participants	228 Turkish individuals (222 students who were in the 5th grade of primary school, and 6 teachers)
Instruments	RCT(Reading Comprehension Test); MSAS (MTS Awareness Scale); Teacher Observation Form (TOF)
Data Analysis Method(s)	Descriptive Statistics; T-tests
Findings/Results	<ol style="list-style-type: none"> 1. No statistically significant difference was found between the pretest scores of the experimental group and the control group students. 2. A statistically significant increase was recorded in the RCT scores of the experimental group students who learned how to find the main idea and to guess the end of the text with the help of metacognitive strategies (MTS) when compared with those of the control group students who continued with traditional training

Kök, İ. (2010). The relationship between students' reading comprehension achievement and their attitudes towards learning English and their abilities to use reading strategies with regard to hemispheric dominance	
Purpose(s)	-to determine the effects of the language curricula designed in compliance with the principles of representational systems on the students' reading comprehension achievement and their attitudes towards learning English with regard to brain dominance and reading strategies
Participants	40 students (14 female, 26 male) from a university preparatory class in the Spring Term of the 2008-2009 Academic Year
Instruments	Pretest; Posttest; Reading Strategies Scale; Brain Dominance Inventory; Attitude Scale; Vocabulary Test; Reading Comprehension Test
Data Analysis Method(s)	Descriptive Statistics; T-test; KR-20 Reliability test
Findings/Results	No statistically significant difference between reading comprehension achievements but there was statistically significant difference between the attitudes of the experimental and the control group students in favor of the experimental group both in left and right brain dominant students.
Cesur, M. O. (2011). Can language learning strategies predict Turkish university prep class students' achievement in reading comprehension?	
Purpose(s)	-to explain and predict the relation between their language learning strategies (LLS) and achievement in reading comprehension in foreign language
Participants	368 Turkish university prep class students from eight universities in
Instruments	Oxford's (1990) SILL; ELT(The English Language Test)
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient

Findings/Results	LLS such as cognitive strategies (CGS), memory strategies (MS), and compensation strategies (CPS) predict and have a direct and significant influence on RP in a foreign language.
Zare, P., and Noordin, N. (2011). The relationship between language learning strategy use and reading comprehension achievement among Iranian undergraduate EFL learners	
Purpose(s)	-to determine the relationship between language learning strategy (LLS) use and reading performance (RP)
Participants	148 Iranian undergraduate EFL students
Instruments	Oxford' (1990) SILL; RCT
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient; Multiple Regression Analysis
Findings/Results	<ol style="list-style-type: none"> 1. The overall use of LLS had a strong positive correlation with RP. 2. MTS was found to be the best predictor of RP.
Ma, R., and Lie, J., Z. (2012). The relationship between reading strategies and reading proficiency	
Purpose(s)	-to investigate the relationship between reading strategy use and reading performances
Participants	186 non-English major university students from North University of China
Instruments	Reading Strategy Use Questionnaire; RCT
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. Cognitive strategy was the most frequently used one, while metacognitive strategy was the least frequently used one. 2. Meta-cognitive and cognitive strategies were positively correlated with reading performance, while negative correlation was found between social strategies and reading performance.

Qin, X., Q. (2013). An analysis of the correlation between English reading strategies and English reading proficiency of Art major	
Purpose(s)	- to investigate the relationship between participants' reading strategy use and their reading proficiency
Participants	122 non-English major university students from Guangxi University of Technology
Instruments	Reading Strategy Use Questionnaire; CET-3
Data Analysis Method(s)	Descriptive Statistics; Pearson Correlation Coefficient
Findings/Results	<ol style="list-style-type: none"> 1. Overall, the participants' reading strategies were slightly positive correlated with their reading proficiency. 2. Cognitive and affective strategies were found significantly correlated with reading proficiency.

From the above table, selected studies into the relationship between reading strategies and reading performances can be concluded that:

1. The participants were all university/college students and adults except one research study by Sen (2009).
2. The purposes of the research studies were more or less to investigate the relationship between participants' reading strategy use and their reading performance.
3. The Reading Strategy Questionnaire/Strategy Inventory for Language Learning and related tests of reading were used in all the research studies except one (Block, 1992).
4. With regard to data analysis methods, Pearson correlation coefficients and multiple linear regression analyses were employed in the majority of studies. Pearson correlation coefficients were utilized to analyze the relationship between reading strategies/language learning strategies and reading performances; and multiple linear regression analyses were employed to test the predictors of reading performances.

5. The findings of the research studies concluded in summary that:

1) Reading strategies (RS) had positive correlations with reading performance (RP) and some individual types of RS (e.g., metacognitive strategies) were found to have direct influence on achievement in RP (Zare & Noordin, 2011; Cesur, 2011; Ma & Lie, 2012; Qin, 2013);

2) Students who used more strategies comprehended better, but no significant relationship between the number of unique strategies and comprehension performance was identified (Anderson, 1991);

3) More proficient readers relied on global strategies and less proficient ones used local strategies (Block, 1992);

4) Lower proficiency level students used more bottom-up processing strategies and advanced level ones used more top-down strategies (Carrell, 1989); and

5) There was no significant difference between male and female participants in the number of strategies used, but there was a gender-related difference in reading comprehension (Brantmeier, 2000).

2.3 Summary

In this chapter, the researcher provided an overall picture of the literature of the theoretical background and previous studies relating to multiple intelligences, thinking styles, and reading strategies. It began by introducing the definitions and theories on multiple intelligences, thinking styles, and reading strategies. It followed with a review of the applications of multiple intelligences, thinking styles, and reading strategies in the field of education. A discussion of the interrelationships between multiple intelligences, thinking styles, and reading strategies followed. Subsequently,

relationships between the participants' reading performance and multiple intelligences, thinking styles, and/or reading strategies were briefly summarized in tables on the basis of presenting the purposes of the investigation, target populations, research instruments, data analysis methods and results/findings. The next chapter will concentrate on the research methods and materials of the present study.



CHAPTER 3

RESEARCH METHODS AND MATERIALS

This chapter describes the research methods and materials to be employed in this study. Nine sections are included in this chapter: Section **3.1** is about the research design; Section **3.2** is the description of participants; Section **3.3** illustrates the conceptual framework of the study; Section **3.4** presents the research instruments; Section **3.5** demonstrates the data collection procedures; Section **3.6** addresses ethical issues in data collection; Section **3.7** presents the data analysis methods; Section **3.8** discusses the pilot study for the three online questionnaires; and, lastly, Section **3.9** presents a summary of this chapter.

3.1 Research Design

The present study was a quantitative research study. A correlational (non-experimental) research design was employed. As Creswell (2012) states, “Correlational designs provide an opportunity for you to predict scores and explain the relationship among variables. In correlational research designs, investigators use the correlation statistical test to describe and measure the degree of association (or relationship) between two or more variables or sets of scores” (p.338). Creswell (2012) also illustrates the characteristics of a correlational design as follows:

- The investigators correlate two or more variables.
- The researchers collect data at one point in time.

- The investigator analyzes all participants as a single group.
- The researcher obtains at least two scores for each individual in the group—one for each variable.
- The researcher reports the use of the correlation statistical test (or an extension of it) in the data analysis.
- The researcher makes interpretations or draws conclusions from the statistical test results.

As mentioned in 1.3 in Chapter one, the main purpose of the present study was to investigate the relationships between Chinese English Major EFL undergraduates' multiple intelligences, thinking styles, reading strategies and their reading performances. The first objective aimed to investigate the relationships between/among the three independent variables, namely participants' multiple intelligences, thinking styles, and reading strategies. The second objective aimed to examine the extent to which the independent variables predict the dependent variable—participants' reading performance. In the present study, a correlational research design was employed because the study is in line with Creswell's (2012) illustration of the characteristics of a correlational research design. Accordingly, and specifically because the research was non-experimental in design, there was no hypothesis being tested in the study. In that sense, the study was empirical in spirit.

3.2 Participants

Three hundred and four English major EFL learners at Kaili University, Kaili, Guizhou, China, participated in the study. They were foreign language learners of English (EFL learners). The participants in this study were between 18 and 20 years of age, most of them had been learning English as a foreign language in Chinese

schools for an average of seven years, first in junior and senior high school and then in university. Participants consisted of the entire body of students in the second academic year of the English program and consisted of six intact EFL classes. All students volunteered in the present study. According to the curriculum, all students are required to take a reading course in the first two years of university study.

All participants were contacted by E-mail by the researcher, the Email addresses were provided by the four teachers in charge of the six classes. Students were required to take the Reading Comprehension Test (RCT). The participants were requested to answer the three online questionnaires voluntarily.

3.3 Conceptual Framework of the Study

The conceptual framework presented below offers a means for examining the relationships between variables in the present study.

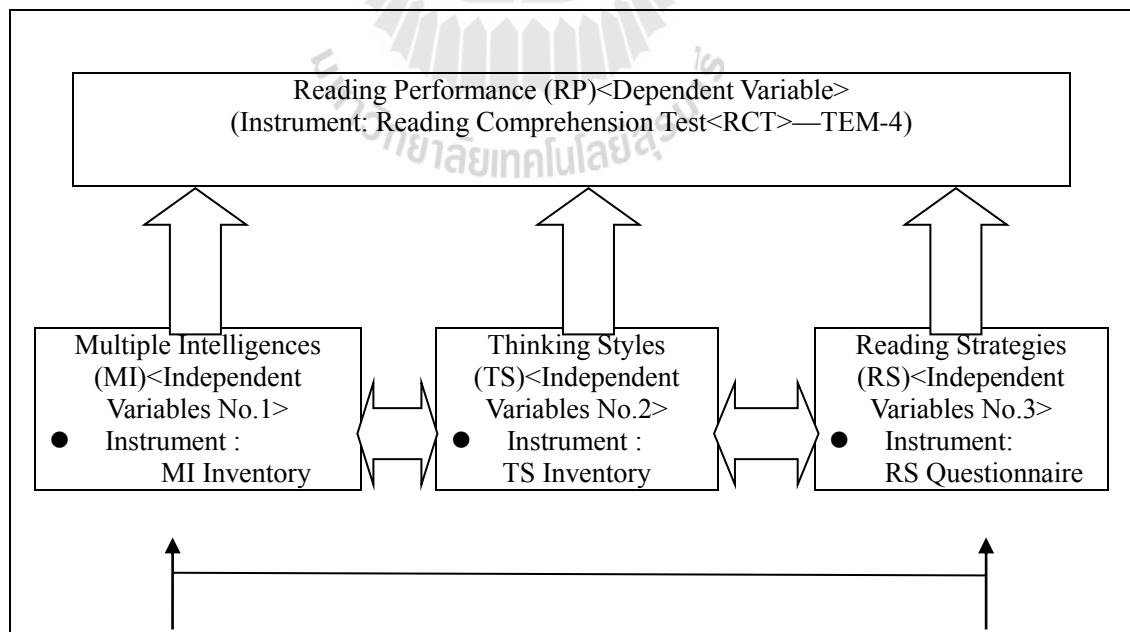


Figure 3.1 The Conceptual Framework of the Study

In order to examine the relationship between the participants' reading performance and their multiple intelligences, thinking styles and reading strategies, multiple intelligences, thinking styles, and reading strategies were identified as independent variables and reading performance as the dependent variable. To investigate whether participants' multiple intelligences, thinking styles, and reading performances were significantly influenced by gender and ethnicity, gender and ethnicity were identified as independent variables while multiple intelligences, thinking styles and reading strategies as dependent variables.

3.4 Research Instruments

The instruments used to elicit information for this study involved three online questionnaires and one test: the questionnaires included the Multiple Intelligences Inventory, the Thinking Styles Inventory, and the Reading Strategy Questionnaire; the Reading Comprehension Test was adopted from TEM-4 as used in the Chinese system. For convenience and to avoid misunderstandings, the three questionnaires were all translated into Chinese. The items on the three online questionnaires all involved 5-point rating scales (Likert Scale) ranging from "never or almost never true of me" to "always or almost always true of me". All the instruments were described in detail below.

3.4.1 Questionnaires

Questionnaires are any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers (Brown, 2001, p.6). The questionnaire can be designed and used to collect vast quantities of data from a variety of respondents. They have a number of benefits over other forms of data

collection: they are usually inexpensive to administer; very little training is needed to develop them; and they can be analyzed quickly and easily once completed (Wilkinson & Birmingham, 2003). Moreover, Dörnyei (2003) illustrates the advantages of using questionnaires:

The main attraction of questionnaires is their unprecedented efficiency in terms of (a) researcher time, (b) researcher effort, and (c) financial resources. By administering a questionnaire to a group of people, one can collect a huge amount of information in less than an hour, and the personal investment required will be a fraction of what would have been needed for, say, interviewing the same number of people. Furthermore, if the questionnaire is well constructed, processing the data can also be fast and relatively straightforward, especially by using some modern computer software. These cost-benefit considerations are very important, particularly for all those who are doing research in addition to having a full-time job. (Dörnyei, 2003, p. 9)

There are two types of questions in a questionnaire: open questions and closed questions. Broadly speaking, most questions are either 'open' or 'closed'. A *closed* question is one in which the respondents are offered a choice of alternative replies; *Open* or free-response questions are not followed by any kind of choice, and the answers have to be recorded in full (Oppenheim, 1992). In the present study, closed questions were employed in the questionnaires as the purpose of the study was to examine the correlations between the variables as measured by standardized tests, not to investigate the participants' opinions or attitudes.

Many questionnaires are now designed to be completed online, via Internet. They are inexpensive to produce and, if carefully developed and designed, can be

automatically coded upon receipt by a specially designed analysis tool (Wilkinson & Birmingham, 2003). Online questionnaires used in this study have more advantages than a general written questionnaire. First of all, using online questionnaires not only saves time and money, but reduces human error in data entry and coding (Fleming & Bowden, 2009). Secondly, online questionnaires can provide a superior questionnaire interface compared to onsite surveys, as it is possible to make them more friendly and attractive, thus encouraging higher response rates. (<http://www.restore.ac.uk/orm/questionnaires/quesads.htm>). Further, responses from online questionnaires can be automatically exported to spreadsheets, databases or statistical packages. Finally, data can be collected continuously, regardless of time of day and day of week, and without geographical limitation (Manfreda, 2001; Madge, 2006).

3.4.1.1 Multiple Intelligences Inventory

The Multiple Intelligences Inventory, which was developed by McKenzie (1999), consists of 90 Likert-type statements related to the nine intelligences set forth by Gardner (1999_a, 1999_b). Previous studies (Al-Balhan, 2006; Razmjoo, 2008; Razmjoo, et al., 2009; Hajhashenmi & Wong, 2010) showed that its overall internal consistency ranged from 0.85 to 0.90, which was an acceptable and high index of reliability.

As mentioned in 2.1.1.4.2, the present study adopted McKenzie's (1999) Multiple Intelligences Inventory (see **Appendix A-1**) for the following reasons: first, the inventory is based on the latest forms of Gardner's intelligence types (nine forms of intelligence). Secondly, many studies have confirmed its validity

and reliability in the context of adult or undergraduate participants. Finally, the Multiple Intelligences Inventory is available online for free.

3.4.1.2 The Thinking Styles Inventory

The Thinking Styles Inventory (Sternberg & Wagner, 1992), a self-report test consisting of 65 items, was used to evaluate student participants' thinking styles. The inventory has 13 scales with five items on each scale. These 13 scales correspond to the 13 thinking styles described in Sternberg's (1997) theory of mental self-government. The Thinking Styles Inventory has been used to investigate students' thinking styles with Chinese respondents in a few studies (e.g., Zhang & Sachs, 1997; Zhang & Sternberg, 2000; Zhang, 2001_b). Findings revealed satisfying internal-consistency reliabilities and validity data (Lam, 2000).

As mentioned in 2.1.3.4, the present study adopted Sternberg and Wagner's (1992) Thinking Styles Inventory (see **Appendix A-2**) to investigate the Chinese English Major EFL undergraduates' thinking styles (TS) profiles/scores. The reason for this is that validity of the inventory has been demonstrated in many studies; the other is that many studies using the inventory involved undergraduate students in China.

3.4.1.3 The Reading Strategies Questionnaire

As mentioned in 2.1.5.2, based on Oxford (1990), O'Malley and Chamot (1990), Cohen and Chi (2001), and Sheorey and Mokhtari's (2001) taxonomies of language learning strategies/reading strategies, the present study adapted Ho's (2007) Reading Strategy Questionnaire to investigate the participants' use of reading strategies. The Reading Strategy Questionnaire consists of only four categories of 30 items (see **Appendix A-3**), including 18 cognitive strategies, five

metacognitive strategies, five compensation strategies, and two social strategies. The reason why the research adapted the only four-category Reading Strategy Questionnaire based on Ho (2007) was as follow: 1) the category of affective strategies is for general language learning; 2) memory strategies is one of the subcategories of cognitive strategies. Cohen's (2002) definition confirms uniting memory and cognitive strategies into one group marked as cognitive as well as Ellis and Sinclair (1989) who provide an overview of particular cognitive strategies, where memory strategies such as grouping, imagery, directed physical response and visual reinforcement are listed only under the term of cognitive strategies; and 3) Ho's (2007) study was conducted in Chinese context.

3.4.1.4 Validity and Reliability Check

The validity and reliability of the data collection instruments are very important to their overall measurement qualities. Since the questionnaire depends on the readability of the statements and the actual wordings used in the items, piloting the questionnaire is a very important step in the questionnaire construction (Dörnyei, 2010) to obtain information about reliability and validity of the instrument. As mentioned above, to avoid misunderstanding and confusion, all of the questionnaire items in English were translated into Chinese. In the present study, the validity and reliability of the questionnaires were checked as follows:

3.4.1.4.1 Content Validity Check

First, to check whether the questionnaire items could measure what they were designed for, the Chinese versions together with the evaluation form for content validity check were sent to three experts. These experts were all full professors and academically qualified. The experts assessed the relevance of each

item in relation to the purpose of the questionnaire and the appropriateness of the content areas, and then checked the evaluation form by using Item-Objective Congruence Index (IOC) as a validation method for the relevancy of the content and the objective of the questionnaire. The evaluation form used a 3-point scale (1 = relevant, 0 = uncertain, -1 = irrelevant).

Next, the questionnaires were adjusted according to the experts' advice and the results of the IOC index for each item and question by item analysis (IAS). According to Booncherd (1974), an acceptable value should be higher or equal to 0.5 (≥ 0.5). The result of all the items in the three questionnaires were 0.94 (see **Appendix D**). In other words, all the items in the questionnaires were acceptable for the present study. The result of the item analysis from the IOC revealed that there were 21 items out of 185 items in the three questionnaires that needed improving and/or revising. The researcher improved and/or revised the items/questions according to the three experts' opinions and suggestions.

Finally, a pilot study was conducted. The three online questionnaires were tried out with thirty undergraduate students in the School of Foreign Languages at Kaili University.

3.4.1.4.2 Reliability Check for the Questionnaire

In order to determine the internal consistency of all 185 items of the three online questionnaires, Cronbach's Alpha (α) Coefficient, the most appropriate reliability index for reliability checking, was used to check the internal consistency of the questionnaire items by analyzing the data from the pilot study. According to Devellis (1991), the questionnaire has good reliability if the alpha value is at least equal to 0.70 ($\alpha \geq 0.70$). As statistical results in the pilot study

showed, the results of the three online questionnaires were .883, .840, and .800, which were acceptable for the main study.

3.4.2 Test--Reading Comprehension Test

A Reading Comprehension Test (see **Appendix B** and **Table 3.1**), which was the reading comprehension section of a retired Test for English Majors (2006) Grade Four (TEM-4) (See **Appendix C**), was used to collect the participants' reading scores.

Table 3.1 Framework Structure of Test for English Majors Grade Four

No.	Test Items	Format	No. of Items	Percentage of scoring (%)	Time (min.)
I	Dictation	-----	1	15	15
II	Listening Comprehension A. Conversations B. Passages C. News Broadcast	Multiple Choice	10 10 10	15	20
III	Cloze	Multiple Choice	20	10	15
IV	Grammar & Vocabulary	Multiple Choice	30	15	15
V	Reading Comprehension	Multiple Choice	20	20	25
VI	Writing A. Composition B. Note-Writing		1 1	15 10	35 10
Total			103	100	135

3.5 Data Collection Procedures

3.5.1 The Three Online Questionnaires

After completing the design of the three questionnaires and having their validity checked by three experts from Kaili University and Guizhou Normal College, the researcher contacted a network company—Dalink (<http://t.qq.com/da-link>) to help upload the online questionnaires. With the help of the technician of the company, the researcher

was permitted to conduct a survey online free of charge. With the help of the teachers in charge of the six classes, the 304 undergraduate students responded to the questions online by going to the given website: <http://www.data100.net/survey.asp?id=10603>. The data were subsequently downloaded after the respondents had finished answering the questionnaires and the invalid data were deleted from the database.

3.5.2 Reading Comprehension Test

To determine the reading comprehension of the participants, a retired Reading Comprehension Test (RCT) was administered. In order to ensure the validity and the reliability of the test, the RCT was conducted as one of the sections of “Intensive Reading” for the mid-term test paper with the 304 undergraduate students from the six classes on May 10, 2013. The examinees were required to finish the section in the last 25 minutes of the session. The data were saved to an Excel file on the researcher’s computer.

3.6 Ethical Issues in Data Collection

Data collection requires researchers to respect the participants and the sites for research. Many ethical issues arise during this stage of the research (Creswell, 2008).

In order not to put participants at risk and to respect the target populations in the process of data collection, the researcher tried to take the least possible number of measurements so as to avoid ethical problems. The principal measure taken was to send a message attached to the online questionnaires by E-mail. The message was to acknowledge that the participants’ rights had been protected during data collection. The message included the following elements, most of which were adopted from Creswell (2002):

- The participants have the right to participate voluntarily and to withdraw at any time, so that the individual is not being coerced into participation.
- The participants know the purpose of the study, so that individuals understand the nature of the research and its likely impact on them.
- The participants know the procedures of the study, so that individuals can reasonably expect what to anticipate in the research.
- The participants have the right to ask questions, obtain a copy of the results, and have their privacy respected.
- The benefits of the study that will accrue to the individual.

3.7 Data Analysis Methods

SPSS (Statistical Package for the Social Sciences) 16.0 was utilized to analyze the data collected in the study. The following calculations were performed.

3.7.1 Descriptive Statistics and One-Way ANOVA

Descriptive statistics were used to calculate and analyze the overall picture of participants' performance on the Reading Comprehension Test and the scores of multiple intelligences, thinking styles, and reading strategies, e.g., mean, standard deviation, etc.

The One-Way ANOVA procedure produces a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. It was used to test whether the learners' multiple intelligences, thinking styles, and reading strategies were significantly different in terms of ethnicity.

3.7.2 Independent-Sample T-test

The Independent-Samples T-test procedure compares means for two groups. In the present study, it was used to test whether the participants' multiple intelligences, thinking styles, and reading strategies were significantly different in terms of their gender.

3.7.3 Pearson Correlation Coefficient (r)

A correlation is a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently (Creswell, 2011, p.338). Correlation is a technique for investigating the relationship between two quantitative, continuous variables. Pearson's correlation coefficient (r) is a measure of the strength of the association between the two variables. In the present study, Pearson's Correlation coefficient (r) was used to test 1) the interrelationship between the independent variables—participants' multiple intelligences, thinking styles, and reading strategies; and 2) the relationship between the three independent variables and dependent variables—multiple intelligences/thinking styles/reading strategies and reading performance.

3.7.4 Multiple Regression Analysis

Multiple regression analysis is an advanced statistical technique that uses more than one predictor, or independent variable, to examine the effects on a single outcome, or dependent variable. In the present study, multiple regression analysis was used to analyze the relationship between independent and dependent variables, more specifically, it was used to test whether the participants' reading performance can be predicted by their multiple intelligences, thinking styles, and/or reading strategies.

3.8 Pilot Study

A pilot, or feasibility study, is a small experiment designed to test logistics and gather information prior to a larger study, in order to improve the latter's quality and efficiency (Lancaster & Williamson, 2004). A pilot study can reveal deficiencies in the design of a proposed experiment or procedure and these can then be addressed before time and resources are expended on large scale studies.

In order to determine the time necessary for the respondents to complete the three online questionnaires and to see whether there were any unclear statements for them, a pilot study was conducted with the same group of students (N=30) at Kaili University, Guizhou, China. While doing that, Cronbach's alpha reliability coefficient was .883 for the Multiple Intelligences Inventory, .840 for the Thinking Styles Inventory, and .800 for the Reading Strategies Questionnaire, these were very high figures, and were therefore acceptable. This result indicated that the instruments used can be considered as reliable tools for the purposes of the study.

3.9 Summary

In sum, this chapter discussed the research design and methodology employed in the present study. Three online written questionnaires and one test were used to investigate the relationships between the participants' scores of multiple intelligences, thinking styles, reading strategies and their reading performances. The data analyses for the questionnaires and tests were conducted using SPSS. At the end of this chapter, a pilot study relating to the three online questionnaires was described. In the next chapter, the analyses and results of the present study will be presented in detail.

CHAPTER 4

DATA ANALYSIS AND RESULTS

This chapter presents the results of the main study. The research findings are presented in response to the five research questions identified in Chapter One. The results presented in this chapter cover five sections: Section 4.1 presents the results of Cronbach's alphas coefficient calculations for the three online questionnaires; Section 4.2 provides a detailed description of the participants' background information; Section 4.3 illustrates the results of the Reading Comprehension Test; and Section 4.4 presents the results in relation to the five research questions which involved Independent-One Sample T-test, One-Way ANOVA, Pearson' Correlation, and Enter Multiple Regression method. The data were all analyzed with **SPSS 16.0 for Windows** (Statistical Package for the Social Sciences); and lastly, Section 4.5 provides a summary of this chapter.

4.1 Results of Cronbach's Alphas Coefficients for Online Questionnaires

As **Table 4.1** shows, Cronbach's alphas coefficients (α) for the three online questionnaires, namely the Multiple Intelligences Inventory (90 items), the Thinking Styles Inventory (65 items), and the Reading Strategy Questionnaire (30 items), were 0.882 ($\alpha = .882$), 0.938 ($\alpha = .938$), and 0.859 ($\alpha = .859$) respectively. According to Devellis (2003), "...below .60, [is] unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable;

between .80 and .90, very good...”(pp.95-96). Thus, the three online questionnaires were found to be highly reliable in the present study.

Table 4.1 Cronbach's Alphas for the Three Online Questionnaires

Reliability Statistics			
	N of Valid Cases	Cronbach's Alpha	N of Items
Multiple Intelligences Inventory	213	.882	90
Thinking Styles Inventory	213	.938	65
Reading Strategy Questionnaire	213	.859	30

4.2 Description of Participants

As mentioned in 3.2 in Chapter Three, 304 students from six intact classes in Kaili University, Guizhou, China, participated in the study. Following is a description of participants in the Reading Comprehension Test (RCT) and the three online questionnaires.

4.2.1 Participants' Ethnic Origin and Gender in Taking the Reading Comprehension Test

Table 4.2.1 presents background information on the participants in the Reading Comprehension Test (RCT) conducted on May 10, 2013. The participants were required to take the RCT and to complete it in approximately 30 minutes. Three hundred and four students participated in the test. As anticipated, a majority of the participants were females (N=206), while the number of males was 98 (N=98). With regard to ethnicity, Chinese Han accounted for the majority with 130 participants (N=130), while the number of Miao, Dong, and other ten ethnic groups (Bouyi, Man, Menggu, Bai, Shui, Gelao, Tujia, Qiang, Hui, and Li) was 65 (N=65), 33 (N=33), and 76 (N=76) respectively. The final data utilized for analyzing in the study were based

on the valid data from the online questionnaires.

Table 4.2.1 Participants' Ethnic Origin and Gender in Taking the Reading Comprehension Test

		Gender		Total
		Male	Female	
Ethnicity	Chinese Han	35	95	130
	Miao	28	37	65
	Dong	13	20	33
	Other minorities	22	54	76
Total		98	206	304

4.2.2 Participants' Ethnic Origin and Gender for the Three Questionnaires

As mentioned in 3.5.1 in Chapter Three, the participants responded to the questions online by going to the following website:

<http://www.data100.net/survey.asp?id=10603>. The participants were required to finish responding to the questionnaires in two months (June 5 to August 5, 2013). It took about 50 minutes to complete the three online questionnaires. Ideally speaking, three hundred and four students should have responded to the online questionnaires. However, due to unreliable Internet access, only 245 of the participants successfully responded to the questionnaires online. After the online survey, the data were exported and saved in a data folder from the online database. In the end, 213 valid questionnaire data were collected because some of the respondents failed to produce their full personal information or there were duplicate entries from some respondents. The results of the participants' background information were presented in **Table 4.2.2** below.

Table 4.2.2 Participants' Ethnic Origin and Gender for the Three Online Questionnaires

		Gender		
		Male	Female	Total
Ethnicity	Chinese Han	22	71	93
	Miao	24	31	55
	Dong	10	17	27
	Other minorities	10	28	38
Total		66	147	213

Like the participants in the Reading Comprehension Test (RCT), **Table 4.2.2** shows the background information of the participants responding to the three online questionnaires. The majority of the participants were females (N=147), while the number of the males was 66 (N=66). Regarding the participants' ethnicity, Chinese Han still accounted for the majority with 93 (N=93), while the number of Miao, Dong, and other ten ethnic groups was 55 (N=55), 27 (N=27), and 38 (N=38) respectively.

4.3 Results of the Reading Comprehension Test

Table 4.3 Descriptive Statistics for Reading Comprehension Test

	N	Min	Max	Mean	SD
Reading Performance	213	3	17	11.08	3.40
Valid N (listwise)	213				

Note. N = Number of participants; Min = Minimum; Max = Maximum; SD = Std. Deviation

Table 4.3 presents the overall results of the Reading Comprehension Test (RCT). The minimum and maximum of scores of the participants were three and 17.

The mean scores of the RCT was 11.08 ($M=11.08$) out of 20 and the standard deviation was 3.40 ($SD=3.40$). As **Figure 4.1** shows, the scores are in the form of a pseudo-normal curve.

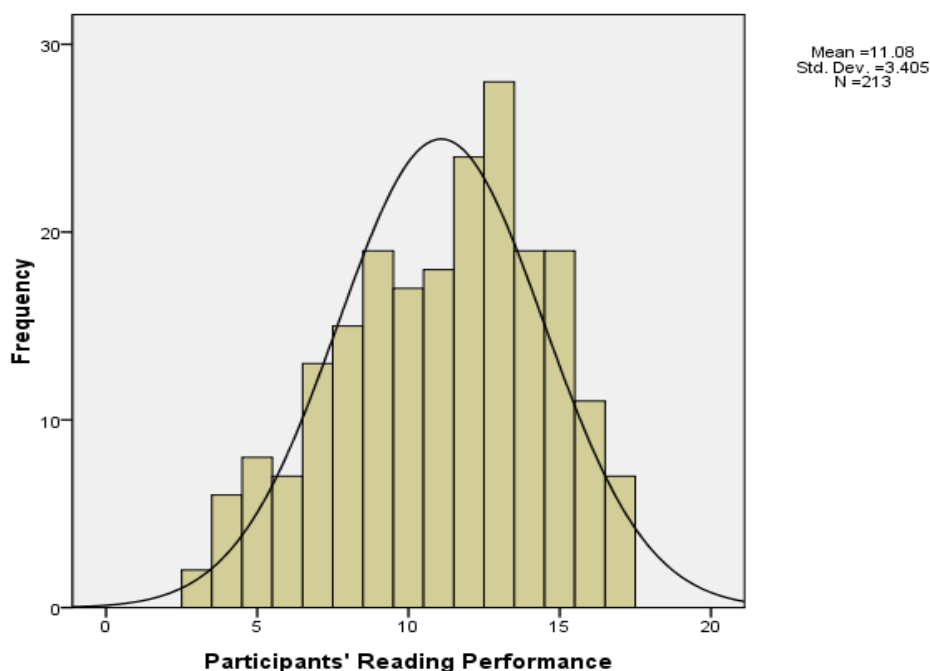


Figure 4.1 Participant's Scores on the Reading Comprehension Test

4.4 Results in Relation to Research Questions

The following results were directly related to the five research questions mentioned in Chapter One.

4.4.1 Results in Relation to Research Question 1

This section is concerned with the findings relating to the first research question mentioned in 1.4 in Chapter One, namely “What are the overall profiles of the Chinese English major EFL learners’ multiple intelligences, thinking styles, and reading strategies? Are there any significant differences in terms of learners’ gender and ethnicity?” In an attempt to answer this question, the results of description of the

participants' scores of the Multiple Intelligences Inventory (MII), the Thinking Styles Inventory (TSI), and the Reading Strategy Questionnaire (RSQ) were firstly reported. Next, we reported the results of Independent Samples Test for the gender with multiple intelligences, thinking styles, and reading strategies. After that, the results of One-Way ANOVA analyses for the different ethnic groups with multiple intelligences, thinking styles, and reading strategies are reported respectively.

4.4.1.1 The Degree of Participants' Response to Online

Questionnaires

To gain the overall level or degree of multiple intelligences, thinking styles, and reading strategy use, a cumulative value was calculated from a total of 185 questions on the three online questionnaires. The degree of participants' responses was given based on the following Likert Scales:

1 = Never or almost never true of me

2 = Usually not true of me

3 = Somewhat true of me

4 = Usually true of me

5 = Always or almost true of me

This cumulative value was then grouped into three levels: the average scores of 3.34-5.00 on the Likert scale were defined as "high degree"; average scores of 1.67-3.33 were defined as "moderate degree"; and average scores defined as "low degree" were 1.00-1.66.

4.4.1.2 Results of Descriptive Statistics for Three Online

Questionnaires

The mean and standard deviation scores of the participants' responses

for the nine individual types of multiple intelligences, the 13 individual types of thinking styles, and the four individual types of reading strategies are provided below.

4.4.1.2.1 Descriptive Statistics for Multiple Intelligences

Table 4.4.1.2.1 Descriptive Statistics for Multiple Intelligences

	N	Min	Max	Mean	SD	Level
Linguistic	213	2.50	4.80	3.78	.48	High
Logical	213	2.40	4.60	3.72	.42	High
Interpersonal	213	2.10	4.80	3.65	.58	High
Bodily/kinesthetic	213	2.00	4.90	3.56	.60	High
Musical	213	2.10	4.50	3.42	.57	High
Existential	213	1.60	4.50	3.39	.51	High
Intrapersonal	213	2.40	4.50	3.37	.42	High
Naturalistic	213	2.10	4.40	3.33	.46	Moderate
Spatial/Visual	213	1.90	4.40	3.26	.53	Moderate

Note. N = Number of participants; Min = Minimum; Max = Maximum; SD = Std. Deviation

Table 4.4.1.2.1 presents the descriptive statistics for participants' profiles/scores for the nine individual types of multiple intelligences. The individual types of multiple intelligences scores reported by the participants were above average. The average scores by participants are in order of magnitude. They are: linguistic intelligence (M=3.78, SD=.48), logical intelligence (M=3.72, SD=.42), interpersonal intelligence (M=3.65, SD=.58), bodily-kinesthetic intelligence (M=3.56, SD=.60), musical intelligence (M=3.42, SD=.57), existential intelligence (M=3.39, SD=.51), intrapersonal intelligence (M=3.37, SD=.42), naturalistic intelligence (M=3.33, SD=.46), and spatial/visual intelligence (M=3.26, SD=.53). It could be observed from the table, the participants scored high in linguistic, logical, bodily-kinesthetic,

musical, existential, and intrapersonal intelligences, while they scored moderately in naturalistic and visual/spatial intelligences.

4.4.1.2.2 Descriptive Statistics for Thinking Styles

Table 4.4.1.2.2 Descriptive Statistics for Thinking Styles¹

	N	Min	Max	Mean	SD	Level
Executive	213	1.60	5.00	3.57	.57	High
Hierarchic	213	1.60	5.00	3.48	.63	High
External	213	2.00	5.00	3.47	.62	High
Legislative	213	1.80	5.00	3.45	.58	High
Liberal	213	1.40	5.00	3.38	.66	High
Judicial	213	1.60	5.00	3.18	.57	Moderate
Local	213	1.80	5.00	3.14	.52	Moderate
Global	213	1.80	5.00	3.12	.56	Moderate
Anarchic	213	1.60	5.00	3.10	.54	Moderate
Oligarchic	213	1.20	5.00	2.96	.56	Moderate
Monarchic	213	1.80	5.00	2.94	.53	Moderate
Internal	213	1.20	5.00	2.90	.60	Moderate
Conservative	213	1.80	5.00	2.75	.38	Moderate

Note. N = Number of participants; Min = Minimum; Max = Maximum; SD = Std. Deviation

Table 4.4.1.2.2 shows the descriptive statistics for participants' profiles/scores in 13 individual types of thinking styles. The average scores by participants are presented in order of magnitude. They are: executive style (M=3.57, SD=.57), followed by hierarchic style (M=3.48, SD=.63), external style (M=3.47, SD=.62), legislative style (M=3.45 SD=.58), liberal style (M=3.38, SD=.66), judicial

¹ Legislative—being creative; judicial—evaluative of other people or products; hierarchical—prioritizing one's tasks; global—focusing on the holistic picture; liberal—taking a new approach to tasks; executive—implementing tasks with given orders; local—focusing on details; monarchic—working on one task at a time; conservative—using traditional approaches to tasks; anarchic—working on whatever tasks that come along; oligarchic—working on multiple tasks with no priority; internal—working on one's own; external—working with others

style (M=3.18, SD=.57), local style (M=3.14, SD=.52), global style (M=3.12, SD=.56), anarchic style (M=3.10, SD=.54), oligarchic style (M=2.96, SD=.56), monarchic style (M=2.94, SD=.53), internal style (M=2.90, SD=.60), and conservative style (M=2.75, SD=.38). It could be seen that the participants' scores in executive, hierarchic, external, legislative style and liberal styles were relatively high, while they were moderate in the other seven individual types of thinking styles.

4.4.1.2.3 Descriptive Statistics for Reading Strategies

Table 4.4.1.2.3 Descriptive Statistics for Reading Strategies

	N	Min	Max	Mean	SD	Level
Cognitive Strategies	213	2.28	5.00	3.50	.42	High
Compensation Strategies	213	1.40	5.00	3.41	.61	High
Social Strategies	213	1.50	5.00	3.37	.66	High
Metacognitive Strategies	213	1.00	5.00	3.27	.67	Moderate

Note. N = Number of participants; Min = Minimum; Max = Maximum; SD = Std. Deviation

As shown in **Table 4.4.1.2.3** below, the results of the descriptive statistics for reading strategies indicated that the most frequently used reading strategy types among participants were cognitive strategies (M=3.50, SD=.42), followed by compensation strategies (M=3.41, SD=.61), social strategies (M=3.37, SD=.66), and metacognitive strategies (M=3.27, SD=.67) respectively. The results revealed the participants reported high use of cognitive, compensation, and social strategies, while they reported moderate use of metacognitive strategies. Among the four individual types of reading strategies, the participants reported using cognitive strategies the most and metacognitive strategies the least.

4.4.1.3 Results of Independent Sample T-Tests for Gender

Differences in Multiple Intelligences, Thinking Styles, and Reading

Strategies

To test whether there were any significant gender differences between the participants' scores on the profiles of multiple intelligences, thinking styles, and reading strategies, three independent-sample t-tests were computed.

4.4.1.3.1 T-Tests for Gender Differences in Multiple Intelligences

As shown in Table 4.4.1.3.1 below, the males reported higher scores in all individual types of multiple intelligences than the females except linguistic intelligence (see **Appendix E**). However, among the nine individual types of multiple intelligences, only bodily/kinesthetic intelligence was found to have significant difference between males ($M=3.72$, $SD=.57$) and females ($M=3.48$, $SD=.59$) with t -test value of 2.681 and p -value of .008 ($t = 2.681$, $p = .008 < .01$).

Table 4.4.1.3.1 T-test for Gender Differences in Multiple Intelligences

	Gender	N	Mean	SD	t	Sig.(2-tailed)
Naturalistic	male	66	3.36	.51	.553	.581
	female	147	3.32	.44		
Musical	male	66	3.51	.58	1.598	.111
	female	147	3.37	.56		
Logical	male	66	3.75	.47	.738	.462
	female	147	3.70	.40		
Existential	male	66	3.48	.50	1.673	.096
	female	147	3.35	.51		
Interpersonal	male	66	3.66	.59	.213	.832
	female	147	3.64	.57		
Bodily/ kinesthetic	male	66	3.72	.57	2.681	<u>.008</u>
	female	147	3.48	.59		
Linguistic	male	66	3.73	.48	-1.037	.301
	female	147	3.80	.48		
Intrapersonal	male	66	3.40	.43	.591	.555
	female	147	3.36	.42		
Spatial/Visual	male	66	3.31	.48	.934	.352
	female	147	3.24	.55		

Note. N = Number of participants; SD = Std. Deviation; t = t-test value.

4.4.1.3.2 T-Test for Gender Differences in Thinking Styles

As shown in **Table 4.4.1.3.2** below, with regard to the 13 individual types of thinking styles, only two were found to have significant gender difference. There was a significant difference in the scores for males ($M=3.25$, $SD=.60$) and females ($M=3.07$, $SD=.53$) on global style with t -test value of 2.186 and p -value of .030 ($t = 2.186$, $p = .030 < .05$). There was a significant difference in the scores for males ($M=3.60$, $SD=.54$) and females ($M=3.41$, $SD=.65$) on external style

with t -test value of 2.058 and p -value of .041 ($t = 2.058, p = .041 < .05$). However, there were no significant differences between the male and female participants on the other eleven types of thinking styles even though the males scored higher than females on all individual types of thinking styles except judicial style (see **Appendix E**).



Table 4.4.1.3.2 T-test for Gender Differences in Thinking Styles²

	Gender	N	Mean	SD	t	Sig.(2-tailed)
Legislative	male	66	3.53	.57	1.351	.178
	female	147	3.42	.59		
Executive	male	66	3.65	.53	1.282	.201
	female	147	3.54	.59		
Judicial	male	66	3.16	.51	-.384	.702
	female	147	3.19	.59		
Monarchic	male	66	3.00	.52	1.037	.301
	female	147	2.92	.54		
Hierarchic	male	66	3.53	.55	.767	.444
	female	147	3.46	.67		
Oligarchic	male	66	3.07	.53	1.924	.056
	female	147	2.91	.57		
Anarchic	male	66	3.18	.56	1.427	.155
	female	147	3.07	.54		
Global	male	66	3.25	.60	2.186	<u>.030</u>
	female	147	3.07	.53		
Local	male	66	3.21	.45	1.280	.202
	female	147	3.11	.55		
Internal	male	66	2.99	.61	1.514	.132
	female	147	2.86	.59		
External	male	66	3.60	.54	2.058	<u>.041</u>
	female	147	3.41	.65		
Liberal	male	66	3.46	.64	1.106	.270
	female	147	3.35	.67		
Conservative	male	66	2.76	.42	.200	.841
	female	147	2.75	.37		

Note. N = Number of participants; SD = Std. Deviation; t = t-test value.

²Legislative—being creative; judicial—evaluative of other people or products; hierarchical—prioritizing one’s tasks; global—focusing on the holistic picture; liberal—taking a new approach to tasks; executive—implementing tasks with given orders; local—focusing on details; monarchic—working on one task at a time; conservative—using traditional approaches to tasks; anarchic—working on whatever tasks that come along; oligarchic—working on multiple tasks with no priority; internal—working on one’s own; external—working with others

4.4.1.3.3 T-Test for Gender Differences in Reading Strategies

As illustrated in **Table 4.4.1.3.3** below, in respect of the individual types of reading strategies, no significant gender difference was identified in the scores on all four types of reading strategy use even though the males seemed to score slightly higher than the females (see **Appendix E**).

Table 4.4.1.3.3 T-test for Gender Differences in Reading Strategies

	Gender	N	Mean	SD	t	Sig.(2-tailed)
Cognitive	male	66	3.57	.38	1.574	.117
	female	147	3.46	.43		
Compensation	male	66	3.58	.60	.927	.355
	female	147	3.39	.61		
Social	male	66	3.38	.64	.123	.902
	female	147	3.37	.67		
Metacognitive Strategies	male	66	3.34	.64	1.029	.305
	female	147	3.24	.68		

Note. N = Number of participants; SD = Std. Deviation; t = t-test value.

4.4.1.4 The Results of One-Way ANOVA for Ethnic Differences in Multiple Intelligences, Thinking Styles, and Reading Strategies

To determine whether there existed any significant differences between the different ethnic groups in relation to multiple intelligences, thinking styles, and reading strategies, three One-Way Analysis of Variance (ANOVA) analyses were performed.

4.4.1.4.1 One-Way ANOVA for Ethnic Differences in Multiple Intelligences

As **Table 4.4.1.4.1a** shows, among the nine individual types of multiple intelligences, only intrapersonal intelligence was found to show a difference between male and female participants ($F = 11.101, p = .001 < .01$).

**Table 4.4.1.4.1a One-Way ANOVA for Ethnic Differences in Multiple
Intelligences**

	Ethnicity	N	Mean	SD	F	p(Sig.)
Naturalistic	Chinese Han	93	3.36	.47	.308	.820
	Miao	55	3.30	.34		
	Dong	27	3.36	.52		
	Other minorities	38	3.29	.55		
	Total	213	3.33	.46		
Musical	Chinese Han	93	3.41	.53	2.432	.066
	Miao	55	3.28	.63		
	Dong	27	3.49	.51		
	Other minorities	38	3.58	.55		
	Total	213	3.42	.57		
Logical	Chinese Han	93	3.73	.44	.964	.411
	Miao	55	3.64	.41		
	Dong	27	3.78	.38		
	Other minorities	38	3.76	.41		
	Total	213	3.72	.42		
Existential	Chinese Han	93	3.34	.50	.851	.468
	Miao	55	3.39	.52		
	Dong	27	3.51	.43		
	Other minorities	38	3.42	.58		
	Total	213	3.39	.51		
Interpersonal	Chinese Han	93	3.76	.53	2.279	.081
	Miao	55	3.62	.62		
	Dong	27	3.52	.60		
	Other minorities	38	3.52	.57		
	Total	213	3.65	.58		
Bodily/kinesthetic	Chinese Han	93	3.55	.61	.321	.810
	Miao	55	3.50	.59		
	Dong	27	3.64	.51		
	Other minorities	38	3.58	.66		
	Total	213	3.56	.60		
Linguistic	Chinese Han	93	3.77	.49	1.051	.371
	Miao	55	3.72	.46		
	Dong	27	3.80	.51		
	Other minorities	38	3.89	.44		

Intrapersonal	Total	213	3.78	.48	11.101	.000**
	Chinese Han	93	3.24	.32		
	Miao	55	3.59	.52		
	Dong	27	3.51	.33		
	Other minorities	38	3.27	.39		
	Total	213	3.37	.42		
Spatial/Visual	Chinese Han	93	3.23	.52	.587	.624
	Miao	55	3.22	.54		
	Dong	27	3.37	.43		
	Other minorities	38	3.30	.60		
	Total	213	3.26	.53		

Note. N = Number of participants; SD = Std. Deviation; F = F-value; p = p- value.

To further examine which groups were different between different ethnic groups in the intrapersonal intelligences, a Multiple Comparisons test using the Tukey Post Hoc criterion for significance was conducted. What **Table 4.4.1.3.1b** illustrated was just intrapersonal intelligence, the other types of multiple intelligences were removed (see **Appendix E**).

Table 4.4.1.4.1b Multiple Comparisons Test for Ethnic Differences in Multiple Intelligences (Intrapersonal Intelligence)

Dependent Variable	(I) Ethnicity	(J) Ethnicity	MD (I-J)	Std. Error	Sig.
Intrapersonal Intelligence	Chinese Han	Miao	-.35517	.06785	.000**
		Dong	-.27180	.08719	.011*
		Other minorities	-.02804	.07679	.983
	Miao	Chinese Han	.35517	.06785	.000**
		Dong	.08337	.09373	.810
		Other minorities	.32713	.08414	.001**
	Dong	Chinese Han	.27180	.08719	.011*
		Miao	-.08337	.09373	.810
		Other minorities	.24376	.10039	.075
	Other minorities	Chinese Han	.02804	.07679	.983
		Miao	-.32713	.08414	.001**
		Dong	-.24376	.10039	.075

Note.*.The mean difference is significant at the 0.05 level;

**..The mean difference is significant at the 0.01 level; MD = Mean Difference

Table 4.4.1.4.1b illustrated the significant difference for the one individual type of multiple intelligences—intrapersonal intelligence. The results of the Multiple Comparisons Test revealed that Chinese Han were found to be significantly different from Miao and Dong on the mean of interpersonal intelligence, the p-value are .001 ($p=.001 < .01$) and .011 ($p=.011 < .05$). The mean scores of Chinese Han ($M=3.24$, $SD=.32$) on intrapersonal intelligences were significantly lower than these of the Miao ($M=3.59$, $SD=.52$) and the Dong ($M = 3.51$, $SD = .33$). Moreover, the Miao group was found to have statistically significant difference from the other ten minorities. The mean scores of the Miao group on intrapersonal intelligence were significantly higher than those of the other 10 minority groups ($M = 3.27$, $SD = .39$).

4.4.1.4.2 One-Way ANOVA for Ethnic Differences in Thinking Styles

Table 4.4.1.4.2a One-Way ANOVA for Ethnic Differences in Thinking Styles

	Ethnicity	N	Mean	SD	F	p(Sig.)
Legislative	Chinese Han	93	3.37	.59	1.062	.366
	Miao	55	3.53	.59		
	Dong	27	3.52	.50		
	Other minorities	38	3.48	.61		
	Total	213	3.45	.58		
Executive	Chinese Han	93	3.51	.54	.977	.404
	Miao	55	3.63	.56		
	Dong	27	3.69	.64		
	Other minorities	38	3.55	.64		
	Total	213	3.57	.57		
Judicial	Chinese Han	93	3.12	.55	1.966	.120
	Miao	55	3.25	.58		
	Dong	27	3.37	.55		
	Other minorities	38	3.10	.57		
	Total	213	3.18	.57		
Monarchic	Chinese Han	93	2.88	.52	.959	.413
	Miao	55	2.99	.58		

	Dong	27	3.04	.59		
	Other minorities	38	2.97	.44		
	Total	213	2.94	.53		
Hierarchic	Chinese Han	93	3.36	.63	2.440	.065
	Miao	55	3.62	.57		
	Dong	27	3.63	.57		
	Other minorities	38	3.48	.73		
	Total	213	3.48	.63		
Oligarchic	Chinese Han	93	2.86	.54	3.359	<u>.020*</u>
	Miao	55	3.10	.56		
	Dong	27	3.13	.57		
	Other minorities	38	2.86	.56		
	Total	213	2.96	.56		
Anarchic	Chinese Han	93	3.00	.52	3.660	<u>.013*</u>
	Miao	55	3.28	.57		
	Dong	27	3.20	.60		
	Other minorities	38	3.04	.47		
	Total	213	3.10	.54		
Global	Chinese Han	93	3.09	.56	.933	.426
	Miao	55	3.08	.53		
	Dong	27	3.28	.59		
	Other minorities	38	3.15	.58		
	Total	213	3.12	.56		
Local	Chinese Han	93	3.07	.46	1.412	.240
	Miao	55	3.21	.52		
	Dong	27	3.28	.62		
	Other minorities	38	3.13	.58		
	Total	213	3.14	.52		
Internal	Chinese Han	93	2.77	.53	3.630	<u>.014*</u>
	Miao	55	3.08	.68		
	Dong	27	3.02	.65		
	Other minorities	38	2.85	.55		
	Total	213	2.90	.60		
External	Chinese Han	93	3.44	.63	.204	.894
	Miao	55	3.46	.60		
	Dong	27	3.50	.62		
	Other minorities	38	3.53	.66		
	Total	213	3.47	.62		
Liberal	Chinese Han	93	3.33	.66	.983	.402
	Miao	55	3.40	.57		
	Dong	27	3.57	.71		
	Other minorities	38	3.34	.78		
	Total	213	3.38	.66		

Conservative	Chinese Han	93	2.67	.39	3.730	<u>.012*</u>
	Miao	55	2.82	.41		
	Dong	27	2.91	.31		
	Other minorities	38	2.76	.32		
	Total	213	2.75	.38		

Note. N = Number of participants; SD = Std. Deviation; F = F-value; p = p- value.

As **Table 4.4.1.4.2a** above shows, there were significant ethnic differences in the scores of four out of the 13 individual types of thinking styles: oligarchic style ($F = 3.359, p = .020 < .05$), anarchic style ($F = 3.660, p = .013 < .05$), internal style ($F = 3.630, p = .014 < .05$), and conservative style ($F = 3.730, p = .012 < .05$).

To further test which groups were different among different ethnic groups in the four individual types of thinking styles mentioned above, a Multiple Comparisons test using the Tukey Post Hoc criterion for significance was conducted. **Table 4.4.1.4.2b** illustrates the four individual types of thinking styles, the other nine types of thinking styles were removed because there were no significant differences (see **Appendix F**).

Table 4.4.1.4.2b Multiple Comparisons Test for Ethnic Differences in the Four Individual Types of Thinking Styles

Dependent Variable	(I)	(J)	MD	Std. Error	Sig.
	Ethnicity	Ethnicity	(I-J)		
Oligarchic Style	Chinese Han	Miao	-.23664	.09439	.062
		Dong	-.26452	.12131	.132
		Other minorities	.00566	.10684	1.000
	Miao	Chinese Han	.23664	.09439	.062
		Dong	-.02788	.13040	.997
		Other minorities	.24230	.11706	.166
	Dong	Chinese Han	.26452	.12131	.132
		Miao	.02788	.13040	.997
		Other minorities	.27018	.13967	.217
	Other minorities	Chinese Han	-.00566	.10684	1.000
		Miao	-.24230	.11706	.166
		Dong	-.27018	.13967	.217
Anarchic Style	Chinese Han	Miao	-.28364	.09166	<u>.012*</u>
		Dong	-.20741	.11780	.295
		Other minorities	-.04737	.10375	.968
	Miao	Chinese Han	.28364	.09166	<u>.012*</u>
		Dong	.07623	.12663	.931
		Other minorities	.23627	.11367	.164
	Dong	Chinese Han	.20741	.11780	.295
		Miao	-.07623	.12663	.931
		Other minorities	.16004	.13563	.640
	Other minorities	Chinese Han	.04737	.10375	.968
		Miao	-.23627	.11367	.164
		Dong	-.16004	.13563	.640
Internal Style	Chinese Han	Miao	-.31093	.10139	<u>.013*</u>
		Dong	-.25329	.13031	.213
		Other minorities	-.08155	.11476	.893

	Miao	Chinese Han	.31093	.10139	.013*
		Dong	.05764	.14007	.976
		Other minorities	.22938	.12574	.265
	Dong	Chinese Han	.25329	.13031	.213
		Miao	-.05764	.14007	.976
		Other minorities	.17173	.15003	.662
	Other minorities	Chinese Han	.08155	.11476	.893
		Miao	-.22938	.12574	.265
		Dong	-.17173	.15003	.662
Conservative Style	Chinese Han	Miao	-.15085	.06488	.096
		Dong	-.24755	.08339	.017*
		Other minorities	-.09745	.07344	.547
	Miao	Chinese Han	.15085	.06488	.096
		Dong	-.09670	.08963	.703
		Other minorities	.05340	.08046	.911
	Dong	Chinese Han	.24755	.08339	.017*
		Miao	.09670	.08963	.703
		Other minorities	.15010	.09601	.402
	Other minorities	Chinese Han	.09745	.07344	.547
		Miao	-.05340	.08046	.911
		Dong	-.15010	.09601	.402

Note. N = Number of participants; SD = Std. Deviation; F = F-value; p = p- value.

As **Table 4.4.1.4.2a** shows, among the 13 individual types of thinking styles, only four were found to have statistically significant differences across the four different ethnic groups, namely oligarchic style, anarchic style, internal style, and conservative style; however, when they were computed by the Tukey Post Hoc criterion (see **Table 4.4.1.4.2b**), only three of them displayed significant differences. Oligarchic style was not found to show any significant difference among different ethnic groups. Chinese Han and Miao group were found to have significantly different

scores from the mean of anarchic style, $p=.012 < .05$. The mean scores of Chinese Han ($M=2.86$, $SD=.54$) on anarchic style were significantly lower than the Miao group ($M=3.10$, $SD=.56$). Similarly, Chinese Han and Miao were found to have significant difference in internal style as well. The mean scores of Chinese Han ($M = 2.77$, $SD = .53$) were significantly lower than these of the Miao group ($M = 3.08$, $SD = .68$). Logically, Chinese Han were also found to have significant differences from Dong with a p -value of $.017$ ($p = .017 < .05$) on conservative style. The mean scores of Chinese Han ($M = 2.67$, $SD = .39$) were significantly lower than these of the Dong group ($M = 2.91$, $SD = .31$).

4.4.1.4.3 One-Way ANOVA for Ethnic Differences in Reading Strategies

Table 4.4.1.4.3 shows the results of a One-Way ANOVA analysis for ethnic differences in reading strategy scores. It can be seen that there were no significant differences in scores among the four ethnic groups tested. Therefore, it was not necessary to conduct a Multiple Comparisons Test in order to test which groups were different in reading strategy use.

Table 4.4.1.4.3 One-Way ANOVA for Ethnic Differences in Reading Strategies

	Ethnicity	N	Mean	SD	F	p(Sig.)
Cognitive	Chinese Han	93	3.43	.38	1.565	.199
	Miao	55	3.56	.46		
	Dong	27	3.58	.33		
	Other minorities	38	3.53	.49		
	Total	213	3.50	.42		
Compensation	Chinese Han	93	3.39	.59	.246	.864
	Miao	55	3.39	.61		
	Dong	27	3.45	.56		
	Other minorities	38	3.48	.70		
	Total	213	3.41	.61		
Social	Chinese Han	93	3.32	.65	.376	.770
	Miao	55	3.41	.61		
	Dong	27	3.42	.68		
	Other minorities	38	3.42	.75		
	Total	213	3.37	.66		
Metacognitive	Chinese Han	93	3.22	.69	.324	.808
	Miao	55	3.32	.63		
	Dong	27	3.33	.54		
	Other minorities	38	3.29	.74		
	Total	213	3.27	.67		

Note. N = Number of participants; SD = Std. Deviation; F = F-value; p = p- value.

4.4.2 Results in Relation to Research Question 2

This section is concerned with the research findings relating to the second research question mentioned in 1.4 in Chapter One, namely “What are the relationships between Chinese English Major EFL learners’ multiple intelligences and thinking styles?” In order to answer this question, a Pearson correlation calculation

was utilized to test the relationship between the participants' scores on each individual type of multiple intelligences and thinking styles.

4.4.2.1 Criterion for Pearson's Correlation Coefficient (r)

Guilford (1973) set a criterion for the significance of Pearson's correlation coefficient (r), according to Guilford, $r < 0.20$ = Negligible Relationship; $0.20 < r < 0.40$ = Low Relationship; $0.41 < r < 0.70$ = Moderate Relationship, $0.71 < r < 0.90$ = High Relationship; and $r > 0.90$ = Very High Relationship. Judgments on the degree of correlations in the present study were based on Guilford's recommendation.

4.4.2.2 Results of Relationship between Multiple Intelligences and Thinking Styles

Table 4.4.2.2 presents the results of Pearson correlation calculation between the nine individual types of multiple intelligences and the thirteen individual types of thinking styles.



Table 4.4.2.2 Pearson Correlation Results of Multiple Intelligences and Thinking Styles³

	LGS	EXS	JDS	MNS	HRS	OGS	ANS	GLS	LCS	ITS	ETS	LBS	CSS
NTI	.407**	.443**	.423**	.224**	.447**	.228**	.330**	.303**	.310**	.197**	.538**	.486**	.106
MSI	.293**	.359**	.197**	.078	.256**	.141*	.217**	.169*	.203**	.083	.361**	.226**	.150*
LMI	.281**	.254**	.244**	.061	.316**	.155*	.158*	.055	.191**	.122	.299**	.264**	.081
ESI	.467**	.535**	.438**	.187**	.479**	.219**	.255**	.243**	.368**	.176*	.430**	.440**	.135*
InteI	.281**	.205**	.197**	.069	.104	.190**	.155*	.091	.015	.033	.260**	.203**	.035
BKI	.475**	.477**	.382**	.206**	.473**	.331**	.333**	.271**	.305**	.181**	.567**	.494**	.141*
LGI	.116	.181**	.112	-.018	.113	.000	.089	.072	-.021	.034	.094	.142*	-.059
IntrI	.050	-.012	.117	-.026	.087	.087	.049	.071	.084	.137*	-.060	.081	-.017
SVI	.511**	.505**	.404**	.351**	.534**	.291**	.357**	.403**	.429**	.302**	.465**	.504**	.188**

Note.*The correlation is significant at the 0.05 level (2-tailed); **. The correlation is significant at the 0.01 level(2-tailed); NTI = Naturalistic Intelligence; MSI = Musical Intelligence; LMI = Logical Intelligence; ESI = Existential Intelligence; InteI = Interpersonal Intelligence; BKI = Bodily/kinesthetic Intelligence; LGI = Logical Intelligence; IntrI = Intrapersonal Intelligence; SVI = Spatial Intelligence; LGS = Legislative Style; EXS = Executive Style; JDS = Judicial Style; MNS =Monarchic Style; HRS = Hierarchic Style; OGS = Oligarchic Style; ANS = Anarchic Style; GLS = Global Style; LCS = Local Style; ITS = Internal Style; ETS = External Style; LBS = Liberal Style; CSS =Conservative Style.

From **Table 4.4.2.2** above, we can observe that almost all the individual types of multiple intelligences correlated significantly with all individual types of thinking styles. The highest positive correlation to exist was between bodily/kinesthetic intelligence and external style ($r = .567, p < .01$); while the lowest

³ Legislative—being creative; judicial—evaluative of other people or products; hierarchical—prioritizing one’s tasks; global—focusing on the holistic picture; liberal—taking a new approach to tasks; executive—implementing tasks with given orders; local—focusing on details; monarchic—working on one task at a time; conservative—using traditional approaches to tasks; anarchic—working on whatever tasks that come along; oligarchic—working on multiple tasks with no priority; internal—working on one’s own; external—working with others

positive correlation was found between existential intelligence and conservative style ($r = .135, p < .05$). Naturalistic intelligence was moderately or low correlated with all the individual types of thinking styles except for the conservative style. Musical intelligence was found to have a low or negligible positive correlation with all types of thinking styles except for monarchic and internal styles. Logical intelligence also showed a low or negligible positive correlation with all types of thinking styles except for monarchic, global, and internal styles. Existential intelligence was found to have moderate or low positive correlations with all types of thinking styles except for internal and conservative styles. Bodily/kinesthetic intelligence was moderately or low correlated with all types of thinking styles except for internal and conservative styles. Interpersonal intelligence showed low or negligible correlation with all types of thinking styles. Interestingly, linguistic intelligence did not seem to have correlations with any types of thinking styles except executive and liberal styles. Intrapersonal intelligence was also found not to have any correlations with individual types of thinking styles except for internal style. Spatial intelligence showed moderate correlations with individual types of thinking styles except for conservative style.

4.4.3 Results in Relation to Research Question 3

This section is concerned with the research findings relating to the third research question mentioned in 1.4 in Chapter One, namely “What are the relationships between the Chinese English Major EFL learners’ multiple intelligences and reading strategy use?” In an attempt to answer this question, the same process and statistical techniques as for Research Question 2 were employed to calculate the correlations between multiple intelligences and reading strategies.

Table 4.4.3 presents the results of Pearson correlation calculations between the

nine individual types of multiple intelligences and the four individual types of reading strategies.

Table 4.4.3 Results of Pearson Correlation between Multiple Intelligences and Reading Strategies

	NTI	MSI	LMI	ESI	IntelI	BKI	LGI	IntrI	SVI
CGS	.290**	.293**	.186**	.301**	.069	.336**	.046	.039	.364**
CPS	.389**	.325**	.251**	.435**	.144*	.363**	.043	-.006	.514**
SCS	.221**	.162*	.227**	.315**	.060	.340**	.034	.019	.307**
MTS	.365**	.299**	.288**	.345**	.188**	.436**	.116	.100	.426**

Note.*The correlation is significant at the 0.05 level (2-tailed); **. The correlation is significant at the 0.01 level (2-tailed); NTI = Naturalistic Intelligence; MSI = Musical Intelligence; LMI = Logical Intelligence; ESI = Existential Intelligence; IntelI = Interpersonal Intelligence; BKI = Bodily/kinesthetic Intelligence; LGI = Logical Intelligence; IntrI = Intrapersonal Intelligence; SVI = Spatial Intelligence; CGS = Cognitive Strategies; CPS = Compensation Strategies; SCS = Social Strategies; MTS = Metacognitive Strategies.

As **Table 4.4.3** shows, among the nine individual types of multiple intelligences, linguistic and intrapersonal intelligences did not significantly correlate with any types of reading strategy use. Naturalistic, existential, bodily/kinesthetic, and spatial intelligences were found to have moderate correlations with all types of reading strategies. Musical and logical intelligences showed low or negligible correlations with all types of reading strategies. There were negligible or no correlations between interpersonal intelligence and all types of reading strategies. The highest positive correlation was between spatial/visual intelligence and compensation strategies ($r = .514, p < .01$); while the lowest positive correlation was found between interpersonal intelligence and compensation strategies ($r = .144, p < .05$).

4.4.4 Results in Relation to Research Question 4

This section is concerned with the research findings relating to the fourth research question mentioned in 1.4 in Chapter One, namely “What are the relationships between the Chinese English Major EFL learners’ thinking styles and reading strategies?” In an attempt to answer this question, the same process and statistical techniques as for Research Questions 2 and 3 were employed to calculate the correlation between thinking styles and reading strategies.

Table 4.4.4 Pearson Correlation Results between Thinking Styles⁴ and Reading Strategies

	Cognitive	Compensation	Social	Metacognitive
Legislative	.383**	.516**	.261**	.472**
Executive	.414**	.557**	.308**	.442**
Judicial	.403**	.481**	.258**	.405**
Monarchic	.417**	.333**	.198**	.222**
Hierarchic	.448**	.524**	.338**	.434**
Oligarchic	.389**	.275**	.236**	.283**
Anarchic	.401**	.343**	.211**	.298**
Global	.361**	.458**	.215**	.272**
Local	.447**	.361**	.316**	.294**
Internal	.402**	.305**	.172*	.214**
External	.284**	.461**	.270**	.465**
Liberal	.409**	.471**	.347**	.523**
Conservative	.305**	.213**	.099	.196**

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

⁴ Legislative—being creative; judicial—evaluative of other people or products; hierarchical—prioritizing one’s tasks; global—focusing on the holistic picture; liberal—taking a new approach to tasks; executive—implementing tasks with given orders; local—focusing on details; monarchic—working on one task at a time; conservative—using traditional approaches to tasks; anarchic—working on whatever tasks that come along; oligarchic—working on multiple tasks with no priority; internal—working on one’s own; external—working with others

Table 4.4.4 presents the results of Pearson correlation calculation between the thirteen individual types of thinking styles and the four sub-variables of reading strategies.

It was observed that almost all four types of reading strategies correlated significantly with all individual types of thinking styles. The highest positive correlation was found to be between compensation strategies and executive style ($r = .557, p < .01$), while the lowest positive correlation was between social strategies and internal style ($r = .172, p < .05$). There was no significant correlation between social strategies and conservative style ($r = .099, p > .05$). Cognitive, compensation, and metacognitive strategies had moderate or low, positive correlations with each type of thinking styles. Low or negligible positive correlations were discovered between social strategies and the individual types of thinking styles except conservative style.

4.4.5 Results in Relation to Research Question 5

This section is concerned with the research findings relating to the fifth research question as mentioned in 1.4 in Chapter One, namely “To what extent can the Chinese English major EFL learners’ reading performance be predicted from their multiple intelligences, thinking styles, and reading strategies?” In an attempt to answer this question, firstly a Pearson correlation calculation was utilized to examine whether the three independent variables—multiple intelligences, thinking styles and reading strategies correlated with the dependent variable—reading performance, and then, an enter multiple regressions method was conducted to test whether and to what extent the learners’ reading performance could be predicted by their reported scores of multiple intelligences, thinking styles, and reading strategies.

4.4.5.1 Results of Pearson Correlation Calculation between Multiple Intelligences, Thinking Styles, Reading Strategies, and Reading Performance

To examine whether a multiple regressions analysis could be performed to determine whether the learners' reading performance could be predicted by their reported scores of multiple intelligences, thinking styles and reading strategy use, Pearson correlation was utilized to test the relationship between multiple intelligences, thinking styles, reading strategies, and reading performance respectively.

Table 4.4.5.1a Pearson Correlation Results between Multiple Intelligences and Reading Performance

	NTI	MSI	LMI	ESI	InteI	BKI	LGI	IntrI	SVI
RP	.289**	.392**	.473**	.238**	.201**	.276**	.203**	.028	.312**

Note. **. The correlation is significant at the 0.05 level (2-tailed); RP = Reading Performance; NTI = Naturalistic Intelligence; MSI = Musical Intelligence; LMI = Logical Intelligence; ESI = Existential Intelligence; InteI = Interpersonal Intelligence; BKI = Bodily/kinesthetic Intelligence; LGI = Logical Intelligence; IntrI = Intrapersonal Intelligence; SVI = Spatial Intelligence

Table 4.4.5.1a presents the results of Pearson correlations between the nine individual types of multiple intelligences and reading performance.

It was discovered that the nine individual types of multiple intelligences correlated significantly with reading performance except for intrapersonal intelligence. The highest positive correlation with reading performance was logical intelligence ($r = .473, p < .01$), while the lowest was interpersonal intelligence ($r = .201, p < .01$).

Table 4.4.5.1b Pearson Correlation Results between Thinking Styles and Reading Performance

	LGS	EXS	JDS	MNS	HRS	OGS	ANS	GLS	LCS	ITS	ETS	LBS	CSS
RP	.361**	.398**	.313**	.153*	.347**	.168*	.183**	.186**	.233**	.134	.331**	.369**	.112

Note.*The correlation is significant at the 0.05 level (2-tailed); **. The correlation is significant at the 0.05 level (2-tailed); RP = Reading Performance; LGS = Legislative Style; EXS =Executive Style; JDS = Judicial Style; MNS =Monarchic Style; HRS = Hierarchic Style; OGS = Oligarchic Style; ANS = Anarchic Style; GLS = Global Style; LCS = Local Style; ITS = Internal Style; ETS = External Style; LBS = Liberal Style; CSS =Conservative Style.

Table 4.4.5.1b demonstrates the results of Pearson's correlation coefficient between thinking styles and reading performance. The results revealed that 11 out of 13 individual types of thinking styles were found to correlate positively with reading performance. However, internal and conservative styles could not be found to have significant correlation with reading performance. The highest correlation with reading performance was executive style ($r = .398, p < .01$), and the lowest was monarchic style ($r = .153, p < .05$).

Table 4.4.5.1c Pearson Correlation Results between Reading Strategies and Reading Performance

	Cognitive	Compensation	Social	Metacognitive
Reading Performance	.221**	.367**	.208**	.553**

Note. **. The correlation is significant at the 0.05 level (2-tailed)

The results of **Table 4.4.5.1c** show that all the individual types of reading strategy were positively correlated with reading proficiency. Metacognitive strategies show the highest correlation with reading proficiency ($r=.553, p=.000 < .001$), and social strategies show the lowest ($r=.208, p=.002 < .01$).

As demonstrated above, among the 26 individual types (subvariables) of multiple intelligences, thinking styles, and reading strategies, only three of them, namely intrapersonal intelligence, internal style and conservative style were not found to have correlation with reading performance. The Pearson's correlation coefficient ranges from .153 to .553, which is at moderate or low level. According to Hatch and Lazaraton (1991), "a correlation in the .30s or lower may appear weak, but in educational research such a correlation might be very important" (p.442). Consequently, a series of multiple regression analyses could be performed to test whether reading performance could be predicted by the 23 individual types of multiple intelligences, thinking styles, and reading strategies.

4.4.5.2 Results of Multiple Regressions for Multiple Intelligences, Thinking Styles, Reading Strategies and Reading Performance

As mentioned in 4.4.5.1 above, to analyze whether the learners' reading performance could be predicted by multiple intelligences, thinking styles and reading strategies, an enter multiple regression analysis was performed individually to identify the relationships between the 23 individual types of multiple intelligences, thinking styles, and reading performance.

4.4.5.2.1 Regression for Multiple Intelligences and Reading Performance

An Enter multiple regression analysis was conducted to examine how well the eight types of multiple intelligences predicted reading performance.

Table 4.4.5.2.1a Results of ANOVA for Multiple Intelligences and Reading**Performance**

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	769.814	8	96.227	11.630	.000 ^a
	Residual	1687.829	204	8.274		
	Total	2457.643	212			

a. Predictors: (Constant), Spatial/Visual Intelligence, Linguistic Intelligence, Interpersonal Intelligence, Logical Intelligence, Musical Intelligence, Existential Intelligence, Naturalistic Intelligence, Bodily-kinesthetic Intelligence

b. Dependent Variable: Reading Performance

Table 4.4.5.2.1b Summary of Coefficients of Multiple Regressions for Multiple Intelligences and Reading Performance

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-9.043	2.552		-3.544	.000
	Naturalistic Intelligence	.615	.567	.084	1.085	.279
	Musical Intelligence	.956	.421	.160	2.274	.024
	Logical Intelligence	2.848	.548	.356	5.201	.000
	Existential Intelligence	-.148	.515	-.022	-.288	.774
	Interpersonal Intelligence	.506	.362	.086	1.397	.164
	Bodily-kinesthetic Intelligence	-.427	.465	-.075	-.919	.359
	Linguistic Intelligence	-.028	.424	-.004	-.066	.947
	Spatial/Visual Intelligence	1.370	.478	.214	2.869	.005

a. Dependent Variable: Reading Performance

Table 4.4.5.2.1c Results of Model Summary for Multiple Intelligences and Reading Performance

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560 ^a	.313	.286	2.876

- a. Predictors: (Constant), Spatial/Visual Intelligence, Interpersonal Intelligence, Linguistic Intelligence, Logical Intelligence, Musical Intelligence, Naturalistic Intelligence, Existential Intelligence, Bodily-kinesthetic Intelligence
 b. Dependent Variable: Reading Performance

Table 4.4.5.2.1a, b, and c show the results of multiple linear regression analyses for multiple intelligences and reading performance. Based on the results in **Table 4.4.5.2a**, the overall model with eight predictors of multiple intelligences has successfully explained the variation in reading performance ($F = 11.630$; $df = 8$; $p = .001 < .01$).

From **Table 4.4.5.2.1b**, musical intelligence was found to have a significant positive influence on reading performance ($t = 2.274$; $p = .024 < .05$; $B = +.956$). Logical intelligence had a significant positive influence on reading performance ($t = 5.201$; $p = .001 < .01$; $B = +2.848$). Spatial/visual intelligence was found to have a significant positive influence on reading performance ($t = 2.869$; $p = .005 < .01$; $B = +1.370$).

The regression equation for predicting reading performance is as follows:

$$\text{Predicted Reading Performance} = -9.043 + 0.615 \text{ Naturalistic Intelligence} + 0.956 \text{ Musical Intelligence} + 2.848 \text{ Logical Intelligence} - 0.148 \text{ Existential Intelligence} + 0.506 \text{ Interpersonal Intelligence} - 0.427 \text{ Bodily-kinesthetic Intelligence} - 0.028 \text{ Linguistic Intelligence} + 1.370 \text{ Spatial/Visual Intelligence}$$

As **Table 4.4.5.2.1c** shows, the multiple correlation coefficient (R) was .560 ($R = .560$). The proportion of explained variance as measured by R square for the above regression equation is .313 ($R^2 = .560$). In other words, 31.3 % of the variance in Reading Performance is explained by the eight intelligences. The standardized beta values in **Table 4.4.5.2.1b** seemed to indicate logical intelligence ($\beta = .356$) as the best predictor of reading performance, followed by spatial/visual intelligence ($\beta = .214$) and musical intelligence ($\beta = .160$). The other five individual types of multiple intelligences were found not to predict reading performance though they are all positively correlated with reading performance.

4.4.5.2.2 Regression for Thinking Styles and Reading Performance

An Enter multiple regression analysis was conducted to examine how well the eleven types of thinking styles predicted reading performance.

Table 4.4.5.2.2a Results of ANOVA for Thinking Styles and Reading Performance

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	537.692	11	48.881	5.117	.000 ^a
	Residual	1919.951	201	9.552		
	Total	2457.643	212			

a. Predictors: (Constant), Liberal Style, Monarchic Style, External Style, Oligarchic Style, Hierarchic Style, Local Style, Global Style, Judicial Style, Executive Style, Anarchic Style, Legislative Style

b. Dependent Variable: Reading Performance

Table 4.4.5.2.2b Summary of Coefficients of Enter Multiple Regression for Thinking Styles⁵ and Reading Performance

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.214	1.691		.718	.473
	Legislative Style	.549	.582	.095	.943	.347
	Executive Style	1.219	.581	.208	2.099	.037
	Judicial Style	.322	.559	.054	.576	.565
	Monarchic Style	-.565	.561	-.089	-1.008	.315
	Hierarchic Style	.432	.495	.081	.873	.384
	Oligarchic Style	.098	.538	.016	.182	.855
	Anarchic Style	-.730	.604	-.118	-1.208	.229
	Global Style	.190	.526	.031	.361	.718
	Local Style	-.027	.541	-.004	-.050	.960
	External Style	.455	.439	.084	1.036	.301
	Liberal Style	.778	.491	.153	1.585	.115

a. Dependent Variable: Reading Performance

Table 4.4.5.2.2c Results of Model Summary for Thinking Styles and Reading Performance

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.468 ^a	.219	.176	3.091

a. Predictors: (Constant), Liberal Style, Monarchic Style, External Style, Oligarchic Style, Hierarchic Style, Local Style, Global Style, Judicial Style, Executive Style, Anarchic Style, Legislative Style

b. Dependent Variable: Reading Performance

⁵ Legislative—being creative; judicial—evaluative of other people or products; hierarchical—prioritizing one's tasks; global—focusing on the holistic picture; liberal—taking a new approach to tasks; executive—implementing tasks with given orders; local—focusing on details; monarchic—working on one task at a time; anarchic—working on whatever tasks that come along; oligarchic—working on multiple tasks with no priority; external—working with others

Tables 4.4.5.2.2a, b, and c show the results of multiple linear regression analyses for thinking styles and reading performance. Based on the results in **Table 4.4.5.2.2a**, the overall model with eleven predictors of thinking styles has successfully explained the variation in reading performance ($F = 5.117$; $df = 11$; $p = .001 < .01$).

From **Table 4.4.5.2.2b**, the executive style was discovered to have a significant positive influence on reading performance ($t = 2.099$; $p = .037 < .05$; $B = +1.219$).

The regression equation for predicting reading performance is as follows:

$$\begin{aligned} \text{Predicted Reading Performance} = & 1.214 + 0.549 \text{ Legislative Style} \\ & + 1.219 \text{ Executive Style} + 0.322 \text{ Judicial Style} - 0.565 \text{ Monarchic} \\ & \text{Style} + 0.432 \text{ Hierarchic Style} - 0.098 \text{ Oligarchic Style} - 0.730 \\ & \text{Anarchic Style} + 0.190 \text{ Global Style} - 0.027 \text{ Local Style} + 0.455 \\ & \text{External Style} + 0.778 \text{ Liberal Style} \end{aligned}$$

As **Table 4.4.5.2.2c** shows, the multiple correlation coefficient (R) was .468 ($R = .468$). The proportion of explained variance as measured by R square for the above regression equation is .219 ($R^2 = .219$). In other words, only 21.9 % of the variance in Reading Performance is explained by the eleven thinking styles. The standardized beta values in **Table 4.4.5.2.2b** seemed to indicate only executive style ($\beta = .208$) as a predictor of reading performance. The other ten individual types of thinking styles were found not to predict reading performance though they are all positively correlated with reading performance.

4.4.5.2.3 Regression for Reading Strategies and Reading Performance

An Enter multiple regression analysis was conducted to examine how well the four types of reading strategies predicted reading performance.

Table 4.4.5.2.3a Results of ANOVA for Reading Strategies and Reading

Performance

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	767.776	4	191.944	23.626	.000 ^a
	Residual	1689.867	208	8.124		
	Total	2457.643	212			

a. Predictors: (Constant), Metacognitive Strategies, Cognitive Strategies, Social Strategies, Compensation Strategies

b. Dependent Variable: Reading Performance

Table 4.4.5.2.3b Summary of Coefficients of Multiple Regressions for Reading Strategies and Reading Performance

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.619	1.717		.943	.347
	Cognitive Strategies	-.191	.556	-.024	-.344	.731
	Compensation Strategies	.564	.407	.101	1.386	.167
	Social Strategies	-.114	.336	-.022	-.339	.735
	Metacognitive Strategies	2.620	.373	.516	7.024	.000

a. Dependent Variable: student's reading test scores

Table 4.4.5.2.3c Regression Analysis Model Summary for Reading Strategies and Reading Performance

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.559 ^a	.312	.299	2.850

- a. Predictors: (Constant), Metacognitive Strategies, Cognitive Strategies, Social Strategies, Compensation Strategies
 b. Dependent Variable: Reading Performance

Tables 4.4.5.2.3a, b, and c show the results of multiple linear regression analysis for reading strategies and reading performance. Based on the results in Table 4.4.5.2.3a, the overall model with four predictors of reading strategies has successfully explained the variation in reading performance ($F = 23.626$; $df = 4$; $p = .001 < .01$).

From Tables 4.4.5.2.3b, only metacognitive strategies was found to have a significant positive influence on reading performance ($t = 7.024$; $p = .001 < .01$; $B = +2.620$).

The regression equation for predicting reading performance is as follows:

$$\text{Predicted Reading Performance} = 1.619 - 0.191 \text{ Cognitive Strategies} + 0.564 \text{ Compensation Strategies} - 0.114 \text{ Social Strategies} + 2.620 \text{ Metacognitive Strategies}$$

As Table 4.4.5.2.3c shows, the multiple correlation coefficient (R) was .559 ($R = .559$). The proportion of explained variance as measured by R square for the above regression equation is .312 ($R^2 = .312$). In other words, 31.2 % of the variance in Reading Performance is explained by the four individual types of reading strategies. The standardized beta values in Table 4.4.5.2.3b seemed to indicate only

metacognitive strategies ($\beta = .516$) as a predictor of reading performance. The other three individual types of reading strategies were found not to predict reading performance though they are all positively correlated with reading performance.

4.5 Summary

This chapter has presented the data analyses and results related to the five research questions. The results of reliability of the three online questionnaires were reported first, followed by the analysis of participants' background information, the analysis of the results of the Reading Comprehension Test, and the results in relation to the five research questions. The data were analyzed using SPSS through descriptive statistics (including means, standard deviations, etc.); independent-samples t-test, one-way ANOVA, Pearson correlation as well as multiple enter regressions method. The next chapter will discuss the results and research findings in detail.

CHAPTER 5

DISCUSSION OF RESEARCH FINDINGS

This chapter discusses the research findings of the present study which were reported in Chapter Four. Based on the results of the data analysis, the researcher will develop the discussion to match the sequence of research questions identified in Chapter One.

The chapter is divided into five sections. Section **5.1** deals with the reliability results for the three online questionnaires. Section **5.2** deals with the background information of the participants by looking at gender and ethnicity. Section **5.3** deals with the results of the Reading Comprehension Test. Section **5.4** deals with the analysis and discussion of the major findings based on the five research questions, namely 1) What are the overall profiles of the Chinese English Major EFL Learners' multiple intelligences, thinking styles, and reading strategies? Are there any significant differences in terms of learners' gender and ethnicity? 2) What are the relationships between the Chinese English Major EFL learners' multiple intelligences and thinking styles? 3) What are the relationships between the Chinese English Major EFL learners' multiple intelligences and reading strategies use? 4) What are the relationships between the Chinese English Major EFL learners' thinking styles and reading strategies use? and 5) To what extent can the Chinese English Major EFL learners' reading performance be predicted from their multiple intelligences, thinking styles, and reading strategies? Lastly, Section **5.5** presents a summary of this chapter.

5.1 Reliability

The Alpha coefficient was developed by Lee Cronbach (1951) to provide a measure of the internal consistency of a test or scale. It is expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test (Tavakol & Dennick, 2011). The results of the Scale test for reliability with SPSS showed that Cronbach's alpha (α) for the three online questionnaires, namely the Multiple Intelligences Inventory (90 items), the Thinking Styles Inventory (65 items), and the Reading Strategy Questionnaire (30 items) gave α scores of 0.882, 0.938, and 0.859 respectively. This indicates a high reliability coefficient (r) for the questionnaires as well as the homogeneity of the items within the scales. The results revealed that the reliability of the three online questionnaires was considered “very good” (Cronbach, 1951; Bland & Altman, 1997; Devellis, 2003; Geoge & Mallery, 2003; Tavakol & Dennick, 2011). Thus, the results of the present study can be considered as reliable.

5.2 Participants

In this section, more detailed information on the participants in the present study will be provided. As mentioned in 3.2 in Chapter Three, 304 students from six intact classes in Kaili University participated in the study. This consisted of the entire population under examination. The following is an analysis of the performance of the participants in the Reading Comprehension Test (RCT) and the three online questionnaires, namely the Multiple Intelligences Inventory, the Thinking Styles Inventory, and the Reading Strategy Questionnaire.

As mentioned in 3.5.2 in Chapter Three, the Reading Comprehension Test (RCT) consisted of a retired TEM-4 (Test for English Majors-Grade Four) from 2006. It was utilized to evaluate the participants' reading proficiency. The RCT was administered as one of the sections of "Intensive Reading" for the mid-term test paper. Normally, the evaluation of a student's achievements in a course consists of two parts: formative assessment and summative assessment. Formative assessment is intertwined with the process of teaching, it happens continuously. Summative assessment happens at the end of a unit, chapter, or class and measures the students' level of learning at that specific moment in time. In Kaili University (KU), the evaluation of a student's achievements in a course consists of three parts: attendance and assignments, mid-term examination, and final examination. Like students in any other university, the students of KU care a great deal about the results of the examinations including mid-term which accounts for 20 percent of the scores in a core course. Therefore, no one is willing to risk a low score by missing the reading comprehension test and all students completed the test.

The majority of the participants were females (N=206), while the number of males was 95 (N=95). This distribution is very common for English majors as it is an accepted view that females are better than males at language learning. On the other hand, it is very common that the number of female students is larger than the number of male students in normal universities in China.

With regard to ethnicity, Chinese Han account for the majority with 130 (N=130), while the number of Miao, Dong, and other ten ethnic groups (Bouyi, Man, Menggu, Bai, Shui, Gelao, Tujia, Qiang, Hui, and Li) was 65(N=65), 33(N=33), and 76 (N=76) respectively. Because Kaili University is located in the capital city of

Qiandongnan Miao and Dong Autonomous Prefecture, there are twelve minority groups of students from other provinces such as Yunnan, Guangxi, Hunan, and Hainan, etc. besides Guizhou, which account for the majority of the participants (N=274). Accordingly, the Miao (N=65) and the Dong (N=33) account for the majority of the ethnic groups.

In the end, the same group of participants (N=213) that responded to the three online questionnaires was utilized for data analysis because all invalid data were removed.

Concerning the participants in the three online questionnaires, they all volunteered to participate in response to the 185 questions and provided their background information. With such a large number of questions, with the benefits of Internet and technology, an online survey was conducted to collect the data. The participants were required to respond to 185 questions relating to their preferences concerning multiple intelligences, thinking styles, and reading strategy use. Ideally speaking, three hundred and four students should have participated in the three online questionnaires. However, due to unreliable Internet access, only 245 of the participants successfully responded to the questionnaires online and, finally, 213 valid questionnaire data sets were collected. The reason for these results can be found in the following conditions: Kaili University is a newly-built local university in Guizhou province, China, and the Internet cannot connect to all parts of the campus so far including the students' dormitories and even some of the classroom buildings. Second, not every student can afford to buy a laptop, computer, or a smart phone to assist their learning. Consequently, while the reduction of final valid data was inevitable, the data collected was more than adequate.

5.3 Reading Comprehension Test

As reported in 4.3, the minimum and maximum scores of the participants were three and 17. The mean scores of the RCT was 11.08 ($M=11.08$) out of 20 and the standard deviation was 3.405 ($SD=3.405$). As **Figure 4.3** in Chapter Four shows, the results did not seem to produce a normal distribution curve even though the TEM-4 (Test for English Majors—Grade Four) can be regarded as an English proficiency test for English majors in China. This is the real situation of TEFL in China. Like other western areas of the country, the situation of TEFL in Guizhou is quite different from that of other regions in China. Because Kaili University (KU) is a newly-built and local ethnic university, KU is in a more difficult situation than other universities. With regard to TEM-4, reaching a national average score is an ideal objective. If one takes the results of the TEM-4 in 2011 as an example, the national average passing rate for the test was 53.17% (Examination Centre of MOE, 2011), but the students' passing rate in KU was less than 10%, which was much lower than the national average. Two possible reasons may explain this. One is that KU is newly-built and local. This is different from other provincial universities. There are more than 2000 universities and colleges in China. At the top of the pecking order are the key universities such as Peking University in Beijing, Fudan University in Shanghai, Sun Yat-sen University in Guangzhou, and so on. Below these are various provincial and local universities and colleges. Among them, there are also a large number of “normal” universities or colleges, which belong to teacher training universities or colleges. As a local university, KU was upgraded from a normal college named Qiandongnan Teachers' College for Nationalities in 2006. The students enrolled in KU are so-called “very average” or “under-achiever” students. They are not top

students. The other reason for this finding is that there are no suitable test training institutions in the university. There are many tests training institutions for TEM-4, CET-4 (College English Test-Grade Four), and CET-6 (College English Test-Grade 6) in many universities in China, but no suitable ones can be found in local universities so that the students lack effective test-taking strategies. Therefore, the test passing rates for either TEM-4/8 or CET-4/6 in local universities is relatively lower than that of other provincial universities. In this respect, the stakeholders involving administration, experts, and teachers are trying to seek suitable measures to change the current situation to improve TEFL in the newly-built and local universities and colleges.

5.4 Research Questions

This section discusses the findings and results directly related to the five research questions mentioned in Chapter One, namely 1) “What are the overall profiles of the Chinese English major EFL learners’ multiple intelligences, thinking styles, and reading strategies? Are there any significant differences in terms of learners’ gender and ethnicity?” 2) “What are the relationships between the Chinese English Major EFL learners’ multiple intelligences and thinking styles?” 3) “What are the relationships between the Chinese English Major EFL learners’ multiple intelligences and reading strategy use?” 4) “What are the relationships between the Chinese English Major EFL learners’ thinking styles and reading strategies?”, and 5) “To what extent can the Chinese English major EFL learners’ reading performance be predicted from their multiple intelligences, thinking styles, and reading strategies?”.

This section first summarizes the findings and results for each research question, and then discusses the related sections or parts of them respectively.

5.4.1 The Overall Profiles for Multiple Intelligences/Thinking Styles/Reading Strategies, Gender Differences, and Ethnicity Differences

What follows provides the results of the analysis relating to overall profiles of multiple intelligences/thinking styles/reading strategies, gender difference, and ethnicity difference based on Chapter Four and provides discussions about them respectively.

5.4.1.1 Multiple Intelligences

Individual multiple intelligences profiles may vary according to different cultural contexts. In the current study, the descriptive statistics results for participants' overall profiles/scores for the nine individual types of multiple intelligences revealed that the average scores by participants are, in order of magnitude (see **Figure 5.1**): linguistic intelligence ($M=3.78$, $SD=.48$), logical intelligence ($M=3.72$, $SD=.42$), interpersonal intelligence ($M=3.65$, $SD=.58$), bodily-kinesthetic intelligence ($M=3.56$, $SD=.60$), musical intelligence ($M=3.42$, $SD=.57$), existential intelligence ($M=3.39$, $SD=.51$), intrapersonal intelligence ($M=3.37$, $SD=.42$), naturalistic intelligence ($M=3.33$, $SD=.46$), and spatial/visual intelligence ($M=3.26$, $SD=.53$). This finding indicates that the individual types of multiple intelligences scores reported by the participants were above average in general.

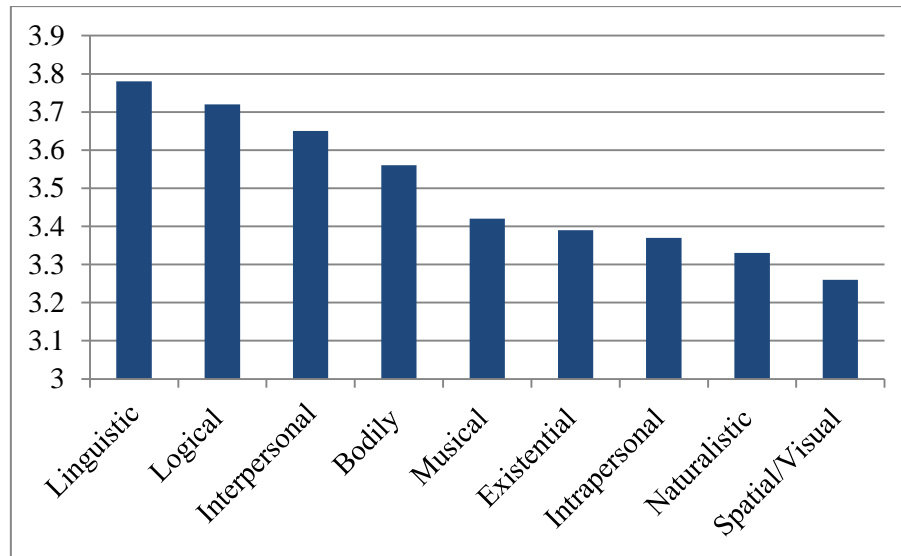


Figure 5.1 Participants' Profiles/Scores for Multiple Intelligences

It was also discovered that the participants' scores in linguistic, logical, bodily-kinesthetic, and musical intelligences were relatively higher, while they were lower in the other five individual types of multiple intelligences. Not surprisingly, linguistic intelligence ranks first among the nine individual types of multiple intelligences. This may be due to the participants all being English majors. Another finding is that logical, bodily-kinesthetic, and musical intelligences were relatively higher. That is, the participants have more strength in logical, bodily-kinesthetic, and musical intelligences. When reading an EFL text or passage, students have a high aptitude for reasoning, logic, and problem solving; furthermore, they tend to experience learning best through various kinds of movement, including mimicking, and role play. Moreover, they can concentrate on a reading text or passage while listening to music, or respond to music and learn best through songs, patterns, rhythms and musical expression.

These findings partially demonstrate the function of the right hemisphere in language learning of the human brain, which is responsible for rhythm, spatial awareness, colour, imagination, daydreaming, holistic awareness and dimension (Banich & Mack, 2003). An interesting finding showed that logical intelligence ranks second and spatial/visual intelligence ranks last, this is possibly due to the participants' educational background before entering a university, since 2003, both non-science-oriented and science-oriented candidates have been allowed to enroll as English majors. This is different from what used to happen in the past where only non-science-oriented candidates were allowed to enroll in English majors in a university or college.

These findings of the current study support the conclusions of studies carried out by Hao and Fu (2006) and Mahaidib (2011), where participants' scores on logical intelligence were higher than those of spatial/visual, musical, and bodily-kinesthetic intelligences. However, the findings of the study seem to contradict those of another study by Wu and Alrabah (2009), who reported that the Taiwanese freshman-level students' general profile was mainly visual, interpersonal, musical, linguistic, logical-mathematical, intrapersonal, kinesthetic, and lastly naturalistic, which is a very different order of multiple intelligences from those of the present study.

As discussed above, students' overall multiple intelligences profiles/scores reflected the function of human brain. According to McFarland (1981), the human brain can be divided into two hemispheres, which are commonly called left brain and right brain, and work differently from one another. The left side seems to operate logically and verbally, the other side functions in more spatial-intuitive mode. Budhietawan (2008) also suggests that left brain indicates logic, analytic, language,

sequence, and mathematics. So the left brain responds to stimuli which need criticizing skills, declaring, analyzing, explaining, discussing and judging. On the other hand, the right brain deals with rhythm, creativity, colour, imagination, and dimension. So the right brain functions if a person is drawing, pointing, playing, exercising, singing, and other motoric activities. In this sense, the findings of this study revealed that students showed greater strength in the left side of the brain. Theoretically, a person has double brain force, because s/he uses both sides of the brain's capacity. The two sides of the brain work together and function equally. Therefore, the training of the right side brain will help students be more "whole brained" in language learning. In this respect, teachers should focus more on teaching techniques which can connect both sides of the brain. In classroom teaching, teachers can organize or develop a variety of learning activities or tasks in training of students' right brain, such as incorporating more patterning, metaphors, analogies, role-playing, visuals, and motor activities. Furthermore, teachers can select teaching materials involving music/rhythm, pictures, dimension, imagination, and daydream, etc. when deciding teaching resources in listening or reading classroom.

In conclusion, each individual has different multiple intelligence profiles. Each individual type of multiple intelligences has different contribution to language learning. Making full use of individual strengths, multiple intelligences will help students improve their language learning.

5.4.1.2 Thinking Styles

Many factors may influence an individual's thinking styles profiles. Individual thinking style greatly affects how people analyze and approach problems, associate with others, organize, communicate, and lead (Harrison & Bramson, 1984).

Sternberg (1997) believes that some variables are likely to affect the development of thinking styles, such as parents, school, and age, etc. (pp.99-107). In the present study, the descriptive statistics resulting for participants' profiles/scores for the 13 individual types of thinking styles produced the following order of styles according to average scores (see **Figure 5.2**): executive style (M=3.57, SD=.57), followed by hierarchic style (M=3.48, SD=.63), external style (M=3.47, SD=.62), legislative style (M=3.45, SD=.58), liberal style (M=3.38, SD=.66), judicial style (M=3.18, SD=.57), local style (M=3.14, SD=.52), global style (M=3.12, SD=.56), anarchic style (M=3.10, SD=.54), oligarchic style (M=2.96, SD=.56), monarchic style (M=2.94, SD=.53), internal style (M=2.90, SD=.60), and conservative style (M=2.75, SD=.38). This finding revealed that the individual types of thinking styles scores reported by the participants were above average in general. The participants scored relatively higher in executive, hierarchic, and external styles, while scoring lower in monarchic, internal, and conservative styles. This finding provides support for the findings of the previous study by Wang (2010), who reported that the Chinese EFL undergraduate students showed more preference for legislative, executive, hierarchic, external, and liberal styles, while less preference for monarchic and conservative styles.

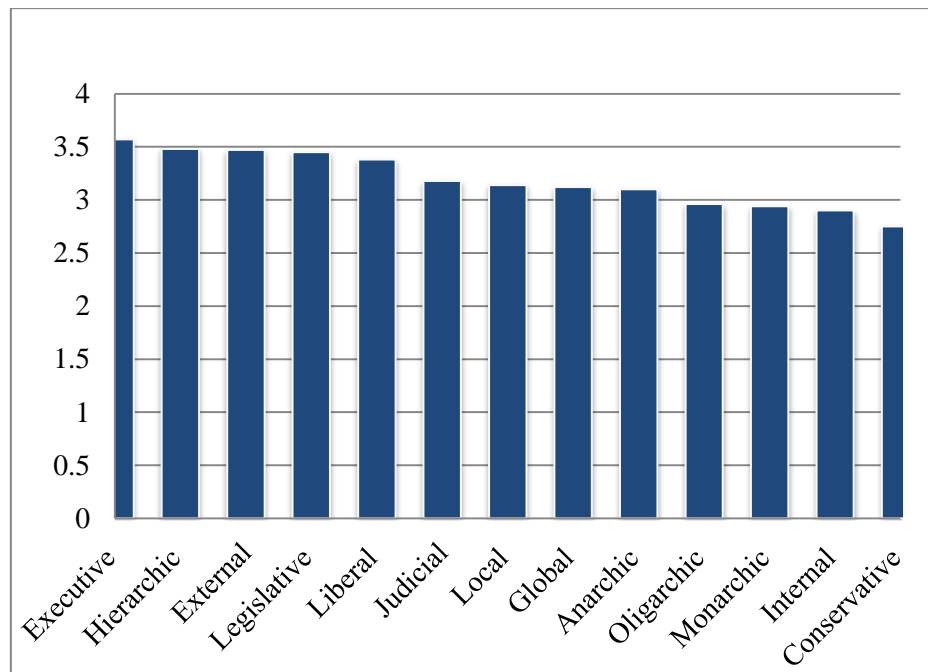


Figure 5.2 Participants' Profiles/Scores for Thinking Styles

According to Sternberg's (1997) five dimensions of mental self-government, in this study, the higher/highest style ranking in each dimension of the 13 thinking styles were as follows:

1. Function—Executive style;
2. Form—Hierarchic style;
3. Level—Local style;
4. Scope—External style;
5. Lean—Liberal style.

That is, in terms of mental self-government, the participants showed more executively in function, hierarchically in form, locally in level, externally in scope, and liberally in lean. These findings support the findings of studies carried out by Wang (2010), Bishop and Foster (2011), Zhu and Zhang (2011), and Khasawneh (2011). In this regard, four inferences can be concluded from the findings of the

study: first, students still tend to follow teachers' instructions both in and out of the classroom; they prefer to work on reading tasks with clear instructions and established guidelines. They did not tend to make comments and judge the performance of others. Second, the students had a very good hierarchic awareness. They had a deep sense of priority when faced with a number of reading tasks. Third, the students preferred to collaborate with others when working on reading tasks. Last, they showed preference for unfamiliar reading materials when performing reading tasks.

These findings reveal that students show great preference for the executive style. It can be inferred that students' creative ability needs improving. Thus, teachers or educators should pay more attention to the cultivation of students' creative ability. At present, students' creative ability is one of the most important objectives in talent cultivation in universities and colleges in China. Zhang and Sternberg (2005) reported that students who prefer creative and complex processing styles (e.g., legislative, judicial and hierarchic) tend to employ some complicated learning methods, while those who prefer executive and simplicity thinking styles tend to use the some simple methods in learning. Zhang (2002) categorized thinking styles into two types. The first type includes legislative, judicial, global, and liberal styles. And the second type includes executive, local, and conservative styles. According to Zhang (2002), "People who use first type of thinking styles tend to be norm challenging and risk taking, and those who use second type of thinking styles tend to be norm favoring and authority oriented." Researchers have also indicated that thinking styles contribute to students' academic achievement beyond what can be explained by abilities: Higher achieving students prefer hierarchical, judicial,

local, and conservative styles; Lower achieving students prefer executive style (Grigorenko & Sternberg, 1997; Zhang & Sternberg, 1998). In this regard, more emphasis should be put on the first type of thinking styles (including legislative, judicial, global, and liberal styles) to cultivate English major students' creative ability. For this reason, three aspects of EFL classroom practices should be strengthened in support of the four thinking styles: First is to guide students to learn how to observe in a variety of classroom activities; second is to stimulate students' imaginative ability in carrying out tasks; third is to encourage students to make comments on activities and presentations.

5.4.1.3 Reading Strategy Use

As presented in Chapter Two, many previous studies were conducted from a variety of aspects of reading strategies. In the present study, the descriptive statistics results of the participants' scores for the individual types of reading strategy use indicated that the most frequently used reading strategy types among participants were cognitive strategies ($M=3.50$, $SD=.42$), followed by compensation strategies ($M=3.41$), social strategies ($M=3.37$, $SD=.66$), and metacognitive strategies ($M=3.27$, $SD=.67$) respectively (see **Figure 5.3**).

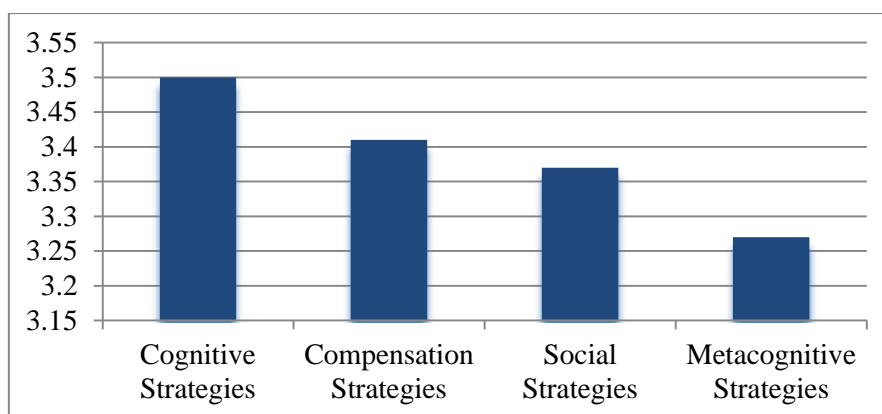


Figure 5.3 Participants' Profiles/Scores for Reading Strategies

This finding indicated that the frequency of the individual types of reading strategies reported by the participants was above average in general. Among the four individual types of reading strategies, the participants reported using cognitive strategies the most and metacognitive strategies the least. These findings were in agreement with Ma and Lie (2012) who also reported the most and least frequently used strategies were cognitive and metacognitive strategies respectively in their study. The findings of the study also partially support the studies conducted by Zhang and Pan (2010), Li and Wang (2011), and Naidu et al. (2013). The possible explanation may account for the findings of the present study. Reading comprehension is very much a cognitive process to the Chinese English major undergraduate students, which supports Piaget's Theory of Intellectual (cognitive) Development "...the formal operational stage is the final stage of cognitive development, and that continued intellectual development in adults depends on the accumulation of knowledge" (McLeod, 2009). Thus, the Chinese English major undergraduate students tend to use such strategies as making mind maps, associations, guessing, underling key words, and scanning, etc. when reading an English text.

It can be inferred from the findings that the training of English major students' metacognitive strategies needs improving. Metacognitive strategies are important for successful second or foreign language readers. Many researchers (Brown, 1980; Carrell, 1989; Carrell, Pharis, & Liberote, 1989; Garner & Alexander, 1989; Chamot & O'Malley, 1990; Dhieb-Henia, 2003) have indicated that metacognitive strategies have positive effects on the reading process. In this respect, the training of English major students' metacognitive strategies should be strengthened both in and out of the EFL reading classroom.

5.4.1.4 Gender Differences

As a nominal variable, gender is one of the most commonly used ones in a survey study. The following will discuss the participants' gender differences in multiple intelligences, thinking styles, and reading strategy use. As the results of Independent Sample T-tests show from 4.4.1.4 in Chapter Four, there was a significant gender difference in the scores on only three out of the 26 individual types of multiple intelligences, thinking styles, and reading strategy use, namely bodily/kinesthetic intelligence, global style and local style.

As regards multiple intelligences, even Gardner (2004) himself suspects that if intelligence-fair tests were developed, they would elicit differences across gender and other readily identifiable groups. In this study, the results revealed that only bodily/kinesthetic intelligence could be found to have significant difference between male ($M=3.72$, $SD=.57$) and female ($M=3.48$, $SD=.59$) students. The male students reported higher scores than the females. However, no gender differences could be found for the other eight individual types of multiple intelligences. This is in conformity with the psychological and personality traits of males and females.

Psychologically, it is agreed that the male students are more physically active than females in universities and/or in colleges. This finding partially supports the research of Barnard and Olivarez (2007), who found that there were no significant gender differences on the subscale level or from examining the total multiple intelligences score. They also reported that there were no significant gender differences in estimates of school valued intelligence scores as a total score composite of logical mathematical and linguistic intelligences. This finding also confirms Razmjoo's (2008) conclusion that there is no significant difference between Iranian males and females in using multiple intelligences in general and each type of intelligences in particular. In contrast, this finding is not exactly in the same line with those of other researchers who reported that significant gender differences do exist in the self-estimation of multiple intelligences (Furnham et al., 2002; Furnham & Akande, 2004; Furnham & Mottabu, 2004; Furnham & Chamorro-Premuzic, 2005).

With respect to thinking styles, Sternberg (1997) states that an important variable that is potentially relevant to the development of thinking styles is gender. Sternberg (1997) believes that males are more likely to be rewarded for a legislative, internal, liberal style, females for an executive or judicial, external, conservative style. According to this view, males and females are socialized in different ways, probably from the time they are born. In the present study, the findings of the participants' thinking styles profiles/scores revealed that the males seemed to be higher than the females except judicial style. However, only global ($t = 2.186$, $p < .05$) and external ($t = 2.085$, $p < .05$) styles were found to have significant differences between male and female students. In this regard, it can be concluded that the male students preferred to collaborate with others, and pay more attention to the

overall picture and issues and abstract ideas when facing with reading tasks.

With respect to reading strategies, gender is one of the most common variables identified by researchers. Interestingly, in the present study, no significant gender differences could be found for all four types of reading strategies even though the male students seemed to score slightly higher than the females. This finding provides evidence that gender differences do not account for difference in strategy use when reading a foreign or second language. The result also support the findings of the studies carried out by Young and Oxford (1997) and Brantmeier (2000), who reported no significant differences by gender in general reading strategy use while reading an L2 passage. In contrast, this finding of the study is not exactly in agreement with those of the previous researchers mentioned in Chapter two, who reported that females tend to be more active reading strategy users than males (Sheorey & Mokhtari, 2001, 2006; Poole, 2005, 2009; Sheorey & Baboczky, 2008). It can be concluded that the male and female students employ almost the same strategies when faced with problems in reading an English text or passage in Chinese EFL contexts.

In conclusion, there were no gender differences among the participants' profiles/scores in multiple intelligences, thinking styles, and reading strategies in general. However, there did exist some gender differences in some of the individual types of multiple intelligences, thinking styles, and reading strategies. Nevertheless, gender differences should not be neglected in an EFL or ESL classroom.

5.4.1.5 Ethnicity Differences

As one of the sub-variables of culture, ethnicity is another nominal variable which is often neglected by many researchers, especially in the field of research on multiple intelligences, thinking styles, and reading strategies. The reason

why it was utilized as one of the variables in the present study is that Kaili University is located in a minority area in Guizhou, China. In this study, we found some interesting and meaningful results. As presented in 4.3.1.4, an interesting finding is that there were significant ethnicity differences from only one individual type of multiple intelligences and four individual types of thinking styles, while no ethnicity differences could be found in reading strategy use. With regard to multiple intelligences, an important finding is that the Chinese Han were found to be significantly different from Miao and Dong in intrapersonal intelligence. The mean scores of Chinese Han ($M=3.24$, $SD=.32$) on intrapersonal intelligences were significantly lower than these of the Miao ($M=3.59$, $SD=.52$) and the Dong ($M = 3.51$, $SD = .33$). Another important finding is that the Miao group was also found to have statistically significant difference from the other ten minorities. The mean scores of the Miao group on intrapersonal intelligence were significantly higher than the other 10 minority groups ($M = 3.27$, $SD = .39$). That is, the Miao tend to be more intrapersonal than the other 10 minority groups in character. Two reasons may explain these findings. One is that the Miao and Dong groups only account for a small number of students in the university even though the Miao and the Dong account for 42% and 31% of population respectively in Qiandongnan Miao and Dong Autonomous Prefecture (NBS, 2011). The other is that the character of the Miao people tends to be frank, modest, and philosophical (Teng, 1996), which is identified to be more intrapersonal in character.

Regarding thinking styles, little previous studies can be found on ethnicity differences. As Sternberg (1997) states, some cultures are likely to be more rewarding of certain styles than those of others. In North Korea, for example, questioning the

government can result in imprisonment or worse, and so parents have a strong incentive to reward a conservative style and to punish a liberal one (Sternberg, 1997). The findings from the present study revealed that only three individual types were found to have statistically significant differences among the four different ethnic groups, namely, anarchic style, internal style, and conservative style. A significant finding is that Chinese Han and Miao were found to be significantly in anarchic style. The mean scores of Chinese Han ($M=2.86$, $SD=.54$) on anarchic style were significantly lower than the Miao group ($M=3.10$, $SD=.56$). That is, when reading English, the Miao students are more prone to working on whatever tasks that comes along than the Chinese Han. An interesting finding is that Chinese Han and Miao were found to have significant difference in internal style as well. The mean scores of Chinese Han ($M = 2.77$, $SD = .53$) were significantly lower than those of the Miao group ($M = 3.08$, $SD = .68$). In other words, the Miao are more internal in Character than Han. When reading an English text, they prefer working on their own. In this respect, the finding also supports the discussion above that the Miao are more intrapersonal in character than Han. Another interesting finding is that Chinese Han were also found having significant difference from Dong on conservative style. The mean scores of Chinese Han ($M = 2.67$, $SD = .39$) were significantly lower than these of the Dong group ($M = 2.91$, $SD = .31$). That is to say, the Dong are more conservative than Chinese Han in character, consequently, they prefer to use traditional approaches to reading tasks. Thus, it can be inferred from the findings of the current study that there do exist some ethnicity differences among different ethnic groups of students in thinking styles. Different ethnic groups of students may have different thinking styles just because of their unique characters.

In sum, ethnicity differences can be regarded as a variable in the research of learners' individual differences in some cases, in particular, in the Chinese EFL contexts in spite of the fact some researchers viewed that people of different ethnic and racial backgrounds did not have different profiles of multiple intelligences or thinking styles (Gardner, 2004).

5.4.2 Relationships between Multiple Intelligences and Thinking Styles

As mentioned from 2.2.1 in Chapter Two, no previous studies can be found into the relationships between multiple intelligences and thinking styles so far. In this study, the findings revealed that almost all the individual types of multiple intelligences correlated significantly with all individual types of thinking styles in general. Interestingly, the highest correlation to exist was between bodily/kinesthetic intelligence and external style ($r = .567, p < .01$). This means that students have strong preference for collaborative ventures with others and tend to experience learning best through various kinds of movement, including mimicking, dancing, and role play. Naturalistic intelligence was moderately or low correlated with all the individual types of thinking styles except for the conservative style. That is to say, students are philosophical in character do not prefer to work on tasks that allow them to adhere to the existing rules and procedures in performing tasks. Musical intelligence was found to have a low or negligible positive correlation with all types of thinking styles except for monarchic and internal styles. We can infer that students with strong strength in music intelligence show no preferences on working on tasks allow complete focus on one thing at a time and in independent tasks. Logical intelligence also showed a low or negligible positive correlation with all types of thinking styles except for monarchic, global, and internal styles. Existential intelligence was found to have

moderate or low positive correlations with all types of thinking styles except for internal and conservative styles. Bodily/kinesthetic intelligence was moderately or low correlated with all types of thinking styles except for internal and conservative styles. These indicate that students with strong logical, existential and bodily/kinesthetic intelligences do not prefer to work independently and perform tasks adhering to the existing rules and procedures. Interpersonal intelligence showed low or negligible correlation with all types of thinking styles. That is, interpersonal intelligence seems not to have anything in common with thinking styles. Interestingly, linguistic intelligence did not seem to have correlations with any types of thinking styles except executive and liberal styles. That is to say, linguistic intelligence has nothing in common with any other individual types of thinking styles except executive and liberal styles. Intrapersonal intelligence was also found not to have any correlations with individual types of thinking styles except for internal style. Spatial intelligence showed moderate correlations with individual types of thinking styles except for conservative style. This indicates that students with conservative style do not tend to think in pictures and mental images.

The finding that bodily/kinesthetic intelligence and external style shows the highest positive correlation also indicate that the more active they show in thinking styles, the more strength in bodily/kinesthetic intelligences the students have. Gardner (1999_b) described bodily/kinesthetic intelligence as the potential for using the whole body or parts of the body in problem-solving or the creation of products. That is to say, if one has strength in bodily/kinesthetic intelligence, he or she will tend to use the whole body or parts of the body in language learning. The use of Total Physical Response (TPR) method in EFL classroom may be regarded as a successful practice

of bodily/kinesthetic intelligence. According to Zhang and Sternberg (2005_b), a person with external style prefers working with others when learning. Hence, it can be inferred from the study that the more external in character one is, the more strength he or she has in bodily/kinesthetic intelligence when learning a foreign or second language.

5.4.3 Relationships between Multiple Intelligences and Reading Strategies

As presented from 4.4.3 in Chapter Four, the findings from the present study revealed that there were correlations between multiple intelligences and reading strategies in general. An interesting finding is that among the nine individual types of multiple intelligences, linguistic and intrapersonal intelligences did not significantly correlate with any types of reading strategies. That is, these two types of multiple intelligences and reading strategies are independent of each other with nothing in common in the process of learning. This particular finding does not support the work of Hafez (2010), who indicated that linguistic intelligence was the best predictor of reading strategies. The findings of the study revealed that naturalistic, existential, bodily/kinesthetic, and spatial intelligences were found to have moderate correlations with all types of reading strategies; Musical and logical intelligences showed low or negligible correlations with all types of reading strategies; There were negligible or no correlations between interpersonal intelligence and all types of reading strategies. These relatively high positive correlations can be regarded as an indication that multiple intelligences is of a rather cognitive nature (Akbari & Hosseini, 2008). The highest positive correlations was between spatial intelligence and compensation strategies ($r = .514, p < .01$), while the lowest negative correlations was found between interpersonal intelligence and compensation strategies ($r = .144, p < .05$).

These findings coincide with the findings of many previous studies which demonstrated that there were meaningful relationships between the participants' multiple intelligences and their use of reading strategies (Akbari & Hosseini, 2008; Arani & Mobarakeh, 2012; Li & Wang, 2012; Rahimi, Mirzaei & Heidari, 2012).

5.4.4 Relationships between Thinking Styles and Reading Strategies

As shown in 4.4.4 in Chapter Four, on the whole, almost all four types of reading strategies were significantly correlated with all individual types of thinking styles. The highest positive correlation was found to be between compensation strategies and executive style ($r = .557, p < .01$), while the lowest correlation was found between social strategies and internal style ($r = .172, p < .05$). There was no correlation between social strategies and conservative style ($r = .099, p > .05$). Cognitive, compensation, and metacognitive strategies had moderate or low, positive correlations with each type of thinking styles. Low or negligible positive correlations were discovered between social strategies and the individual types of thinking styles except conservative style. That is, thinking styles and reading strategies have much in common in the process of learning. In this view, these findings can neither confirm nor disconfirm the findings of prior research studies because no previous study can be found into the relationship between thinking styles and reading strategies.

5.4.5 The Interrelationships between Multiple Intelligences, Thinking Styles, and Reading Strategies

As discussed in the previous sections, in general, there are relatively moderate correlations between participants' multiple intelligences, thinking styles, and reading strategies. In this regards, it can be concluded that multiple intelligences, thinking styles, and reading strategies are all of a cognitive nature to some extent. In

the process of learning, students consciously or unconsciously use their own intelligences and preferred styles or learning strategies to identify problems, analyze and solve problems in order to achieve the learning objectives. To a great extent, the process of language learning can be regarded as the process of learners' cognitive development which involves the identification, analysis and solution of problems. Both multiple intelligences and reading strategies represent a potential ability, and thinking styles are the preference in solving problems in the process of reading. Thus, multiple intelligences, thinking styles, and reading strategies showed a high correlation in the present study.

Gardner (2011) provides "a reasonable set of factors to be considered in the study of human cognition" for identification of individual multiple intelligences. That is, to study multiple intelligences is to study human cognition. In this respect, the process of cognitive development can be regarded as the process of multiple intelligences. With regard to intelligences and styles, Gardner (2012) states:

Many individuals have pointed out that my list of intelligences resembles lists put out by researchers interested in learning styles, working styles, personality styles, human archetypes, and the like; and asked what is new in my formulation. Without question, there will be overlap between these lists, and I may well be trying to get at some of the same dimensions as those in the 'styles' world. (p.39)

Many researchers identified that the theory of multiple intelligences is seen as one of an array of competing explanations of human cognitive functioning (Dixon & McPhee, 2001). According to Sternberg (1997), thinking styles are a type of cognitive style in nature, which refers to one's habitual patterns or preferred ways of thinking while doing something. As Brantmeier (2002) states, in general terms, learner strategies

are the cognitive steps learners use to process second language input. These cognitive procedures include retrieving and storing new input. More specifically, reading strategies are the cognitive processes that readers employ in order to comprehend what they are working on in a reading task. This process may involve skimming, scanning, guessing, recognizing cognates and word families, reading for meaning, predicting, activating general knowledge, making inferences, following references, and separating main ideas from supporting ideas (Barnett, 1988).

Hence, to study the interrelationship between multiple intelligences, thinking styles, and reading strategies in Chinese EFL contexts will enrich the research into individual differences in SLA.

5.4.6 The Inventories of Multiple Intelligences and Thinking Styles

The Pearson correlation coefficients between multiple intelligences and thinking styles reveal that there do exist massive correlations between them. In this view, it seems that the inventories of multiple intelligences and thinking styles are measuring the same things, i.e., they are not very different from each other. The inventories of multiple intelligences and thinking styles were developed from Gardner's (1983) theory of multiple intelligences and Sternberg's (1997) theory of thinking styles respectively.

There have been different views on the number of different types of multiple intelligences since Gardner developed the seven types of multiple intelligences in 1983. As mentioned in Chapter two, Gardner (1983) established eight criteria for identification of a unique intelligence. Thus, he added the eighth and ninth types of multiple intelligences in 1997 and 1999. Gardner (2005) himself points out, "In future years, new proposed intelligences might be found to meet the criteria for

identification as a unique intelligence.” Accordingly, different inventories for different ages and based on different number of multiple intelligences were developed by many researchers (Shearer, 1996; McKenzie, 1999; Armstrong, 2009).

Similarly, the number of different types of thinking styles is not unique. According to Sternberg’s (1997) theory of mental self-government, there are 13 types of thinking styles that fall along five dimensions involving function, forms, levels, scopes, and leanings. Zhang (2002) categorized the 7 thinking styles into two types. The first type includes legislative, judicial, global, and liberal styles. And the second type includes executive, local, and conservative styles. In 2005, Zhang and Sternberg re-conceptualized the 13 thinking styles into three types: Type I, Type II, and Type III. Correspondingly, relating inventories for different ages of people were developed by researchers (Sternberg, 1992; Zhang & Sternberg, 1998).

The theories of multiple intelligences and thinking styles have been developing since they were applied in the field of education. This has resulted in a change in the number of categories/types of multiple intelligences and thinking styles.

5.4.7 The Extent to which Reading Performance can be Predicted by Multiple Intelligences, Thinking Styles, and Reading Strategies

As presented in 4.4.5.1 in Chapter Four, among the 26 individual types of multiple intelligences, thinking styles, and reading strategies, only three, namely intrapersonal intelligence, internal style and conservative style were not found to have correlations with reading performance. That is to say, multiple intelligences, thinking styles, and reading strategies can predict participants’ reading performance to different extents.

5.4.7.1 Multiple Intelligences and Reading Performance

As illustrated from 2.2.2.1 in Chapter two, a number of research studies were conducted on the effect of multiple intelligences on different aspects of language learning. In the present study, the major findings are that among the eight individual types of multiple intelligences, only three were discovered to predict reading performance significantly. An important finding is that the best predictor of reading performance is logical intelligence, $B = +2.848$, $\beta = .356$, $t(213) = 5.201$, $p < .01$; followed by spatial/visual intelligence, $B = +1.370$, $\beta = .214$, $t(213) = 2.869$, $p < .01$; and musical intelligence, $B = +.956$, $\beta = .160$, $t(213) = 2.274$, $p < .05$. In this respect, the current study's results confirm the findings of McMahan, Rose and Parks (2004) and Motalebzadeh and Manouchehri (2009), who concluded that logical/mathematical intelligence acts as a predictor of IELTS reading scores. These results also partially support the findings of Ahmadian and Jalilian (2012) that spatial/visual intelligence was regarded as a great role in determining performance in reading. The results are furthermore in line with the previous research of Fahim, Bagherka-zemi and Alemi (2010). In contrast, the findings do not confirm Razmjoo's (2008) conclusion that no relationship could be found between multiple intelligences and language proficiency. The findings are, however, not exactly in agreement with those of Hajhashemi and Eng's (2012) who reported that linguistic and bodily-kinesthetic intelligences serve as predictors of reading competency.

Hence, one may conclude that students with higher logical/mathematical, spatial/visual, and musical intelligence would perform better in second or foreign reading passages. In this respect, the training of students' logical/mathematical, spatial/visual, and musical intelligence may offer a possible way to improve second or

foreign language learning.

Another important finding is that the other six individual types of multiple intelligences, namely linguistic, bodily-kinesthetic, intrapersonal, interpersonal, naturalist, and existentialist were not found to predict reading performance. The results of the current study are consistent with the findings of Hajhashemi and Eng's (2012), which reported no significant correlation between multiple intelligence and reading scores of the participants.

It can be inferred that multiple intelligences as a predictor of English major students' reading performance are not significantly effective even though logical, spatial/visual, and musical intelligences can be predictors of their reading performance. This is possibly due to the influence of learners' motivation, attitudes towards culture and/or foreign languages, and so on, which maybe influence the realization of their potentials in solving problems when facing an English reading task.

From this point of view, as English majors, students should be trained on their logical, spatial/visual, and musical intelligences. Gardner (1993) believes that all of multiple intelligences can be enhanced through training and practice. Multiple intelligences thus belong to a group of instructional perspectives that focus on differences between learners and the need to recognize learner differences in teaching. For this reason, attention should be paid to the application of multiple intelligences to EFL classrooms. More importantly, an emphasis should be put on the training of EFL learners' strength on logical, spatial/visual, and musical intelligences so as to improve their reading performance.

5.4.7.2 Thinking Styles and Reading Performance

As presented in 2.2.2.2 in Chapter two, there have been some studies into the relationship between thinking styles and academic performance. However, no previous research studies were found relating to academic performance on reading. In the present study, the major finding is that only the executive style was discovered as significantly predicting reading performance, $B = +1.219$, $\beta = .208$, $t(213) = 2.099$, $p < .05$. The other 12 individual types of thinking styles were found to predict reading performance. In this regard, this finding can neither consistent nor inconsistent with the findings of previous studies. This result is in agreement with the real EFL situation in Chinese contexts.

This finding reveals that thinking styles as a predictor of English major students' reading performance are not exactly significantly effective although the executive style was found predicting their reading performance. Two reasons may possibly explain this result. One is that the educational system results in learners' learning patterns or styles that they prefer the executive style in EFL classroom. They are so-called "good learners" who tend to follow everything teachers instruct in classroom. They prefer to complete reading tasks with clear instructions and structure and established guideline when faced with an English text or passage. The other reason may be due to the EFL situations in China. In most cases, to the majority of EFL learners, to study English is to pass all kinds of examinations for a variety of purposes. They tend to study test-taking strategies by following some grammatical rules. In this view, the training of EFL learners' executive style seems to be more important. Sternberg (1997) believes that thinking styles can be trained in many ways. Besides the executive style, in fact, such styles as legislative, judicial, global, and

liberal should be trained to enhance the development of learners' creativity. Zhang and Sternberg (2005) claim that Type I styles (legislative, judicial, global, and liberal styles) tend to be more creativity generating and denote higher levels of cognitive complexity.

5.4.7.3 Reading Strategies and Reading Performance

As presented from 2.2.2.3 in Chapter Two, there were some studies on the relationship between reading strategies and reading performance in different contexts. In the current study, the major finding is that only metacognitive strategies could predict reading performance, $B = +2.620$, $\beta = .516$, $t(213) = 7.024$, $p < .01$; Considering the Beta values (β), cognitive, compensation, and social strategies could not predict reading performance. This finding was in agreement with the results of Zare and Noordin (2011) who found that metacognitive strategies provided the best predictor of reading proficiency. The finding furthermore supported the findings of the studies carried out by Cesur (2011), Ma and Lie (2012), and Qin (2013).

For this reason, metacognitive strategies should be taught and trained in EFL/ESL reading classroom. Oxford (1990) claims that learning strategies are teachable and can be trained:

Strategy training is most effective when students learn why and when specific strategies are important, how to use these strategies, and how to transfer them to new situations. Strategy training must also take into accounts learners' and teachers' attitudes towards learner self-direction, language learning, and the particular language and culture in question. (pp. 12-13)

In this view, reading strategies are also teachable and can be trained, also. Metacognitive strategies, in particular, should be taught and trained. To achieve this, EFL/ESL teachers can provide readers with various genres of texts (reading materials) to practice in time-on-task activities. Palincsar and Brown (1984) believed that four activities can aid in comprehension-fostering and comprehension-monitoring activities. These involve self-questioning, summarizing, clarifying, and predicting. Carrell, Pharis and Liberto (1989) and Lontas (1999) also offer practical ideas about metacognitive strategy training for ESL and second/foreign language readers.

5.4.7.4 The Training of Multiple Intelligences, Thinking Styles, and Reading Strategies

As discussed in the previous sections, multiple intelligences, thinking styles, and reading strategies are teachable and can be trained in different ways. In this respect, the choices of specific reading strategy will be influenced by learners' multiple intelligences and thinking styles. Therefore, to insure the effectiveness of the training of EFL learners' reading strategies, both multiple intelligences and thinking styles should be taken into account.

First, EFL teachers should study learners' individual differences on multiple intelligences and thinking styles. More specifically, EFL teachers should know more about EFL students' strengths on all types of multiple intelligences and their preferences on all types of thinking styles so that they can help students to achieve a perfect match when facing different reading tasks.

Second, effectively training EFL learners' reading strategies in a manner which correlates with their individual strengths on multiple intelligences and preference on thinking styles may help them improve their multiple intelligences and

transform thinking styles to improve their reading comprehension and English proficiency as well.

5.5 Summary

This chapter presented an analysis and discussions on the research findings related to the five research questions in the present study. Discussion of the reliability of the three online questionnaires was firstly presented. The next discussion involved the distribution of the participants' background information by gender and ethnicity, and the results of the Reading Comprehension Test. Following that, the main focus was on the analysis and discussion of the major findings of the five research questions. In the next chapter, a summary of the findings, pedagogical implications, limitations of the study as well as recommendations for further research will be presented.

CHAPTER 6

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

This chapter summarizes the study's major findings and provides implications and recommendations for pedagogy and research. It consists of four sections. Section **6.1** is a summary of the key findings as related to the five research questions that launched the study. Section **6.2** follows with pedagogical implications on integrating the theories of multiple intelligences, thinking styles, and reading strategies with practice in the curriculum development and design. Section **6.3** presents the limitations of the study. Lastly, Section **6.4** proposes some recommendations for future research.

6.1 Summary of the Major Findings

This study was to investigate the possible relationships between Chinese English Major EFL undergraduates' multiple intelligences, thinking styles, reading strategies and reading performance. In line with the results and discussions in the previous chapters, a brief summary of the major research findings is illustrated as follows.

1. The overall profiles of the Chinese English Major EFL undergraduate students' multiple intelligences, thinking styles, and reading strategies revealed that students scored highly on many multiple intelligences, thinking styles, and reading

strategies. These related high scores indicated that they were multi-talented in all areas. With respect to multiple intelligences, students' linguistic intelligence ranked the highest, followed by logical intelligence, interpersonal intelligence, bodily-kinesthetic intelligence, musical intelligence, existential intelligence, intrapersonal intelligence, naturalistic intelligence, and spatial/visual intelligence.

Regarding thinking styles, the executive style was reported highest by the students, followed by hierarchic style, external style, legislative style, liberal style, judicial style, local style, global style, anarchic style, oligarchic style, monarchic style, internal style, and conservative style.

In respect of reading strategies, the most frequently used strategies by students were cognitive strategies, followed by compensation strategies, social strategies, and metacognitive strategies.

With regard to gender, there were significant differences between male and female students on multiple intelligences and thinking styles, while no significant differences could be found between males and females on reading strategy use. Among the nine individual types of multiple intelligences, only bodily/kinesthetic intelligence was found to have significant difference between males and females, the male students scored higher than the females did. Only two out of the 13 individual types of thinking styles were found to have significant gender difference. Male students reported higher scores on global and external styles than female students. However, no significant gender difference was identified in the scores on all four types of reading strategy use.

Concerning ethnicity, not all the individual types of multiple intelligences, thinking styles, and reading strategies were found to have differences among the four

groups of participants. However, there were significant differences between Chinese Han, Miao, Dong, and other minority groups on some individual types of multiple intelligences, thinking styles, while no significant differences could be found on the frequency of reading strategy use. Chinese Han scored lower on anarchic style than Miao. Also, Chinese Han reported lower scores on intrapersonal style than Miao and Dong. Miao reported higher scores on this style than the other minority groups. Similarly, Chinese Han and Miao were found to have significant difference in internal style as well. Chinese Han scored significantly lower than Miao. On conservative style, Chinese Han scored significantly higher than Miao.

2. The Chinese English Major EFL learners' multiple intelligences closely correlated with their thinking styles in general. Almost all the individual types of multiple intelligences correlated significantly with all individual types of thinking styles. The highest correlation exist was between bodily/kinesthetic intelligence and external style. Naturalistic intelligence was moderately or low correlated with all the individual types of thinking styles except for the conservative style. Musical intelligence was found to have a low or negligible positive correlation with all types of thinking styles except for monarchic and internal styles. Logical intelligence also showed a low or negligible positive correlation with all types of thinking styles except for monarchic, global, and internal styles. Existential intelligence was found to have moderate or low positive correlations with all types of thinking styles except for internal and conservative styles. Bodily/kinesthetic intelligence was moderately or low correlated with all types of thinking styles except for internal and conservative styles. Interpersonal intelligence showed low or negligible correlation with all types of thinking styles. Interestingly, linguistic intelligence did not seem to have

correlations with any type of thinking styles except executive and liberal styles. Intrapersonal intelligence was also found not to have any correlation with individual types of thinking styles except for internal style. Spatial intelligence showed moderate correlations with individual types of thinking styles except for conservative style.

3. The Chinese English Major EFL learners' multiple intelligences significantly correlated with their reading strategy use. Among the nine individual types of multiple intelligences, linguistic and intrapersonal intelligences did not significantly correlate with any types of reading strategy use; Naturalistic, existential, bodily/kinesthetic, and spatial/visual intelligences were found to have moderate correlations with all types of reading strategies; Musical and logical intelligences showed low or negligible correlations with all types of reading strategies; There were negligible or no correlations between interpersonal intelligence and all types of reading strategies; The highest positive correlations was between spatial intelligence and compensation strategies; while the lowest negative correlations was found between interpersonal intelligence and compensation strategies.

4. The Chinese English Major EFL learners' thinking styles significantly correlated with their reading strategies. Almost all four types of reading strategies significantly correlated with all individual types of thinking styles. The highest positive correlation was found to be between compensation strategies and executive style, while the lowest correlation was between interpersonal intelligence and conservative style. No correlation could be found between social strategies and conservative style at all. Cognitive, compensation, and metacognitive strategies had moderate or low, positive correlations with each type of thinking styles. Low or negligible positive correlations were discovered between social strategies and the

individual types of thinking styles except conservative style.

5. The Chinese English major EFL learners' reading performance could be predicted from their multiple intelligences, thinking styles and reading strategies to some extent. Among the nine types of multiple intelligences, only three were discovered significantly predicting reading performance. The best predictor of reading performance is logical intelligence, followed by spatial/visual and musical intelligences. Among the 13 individual types of thinking styles, only executive style was discovered significantly predicting reading performance. In respect of the four individual types of reading strategies, only metacognitive was found significantly predicting reading performance.

In conclusion, multiple intelligences, thinking styles, and reading strategies are the three important variables in learners' individual differences. They partially overlap in some respects. They are of a cognitive nature to some extent. As their definitions go, both multiple intelligences and reading strategies are "the potential ability" (Rubin, 1987; Gardner, 1993); thinking styles are "...a preferred way of using the abilities one has" (Sternberg, 1997). Different people may have different profiles in different individual types of multiple intelligences, thinking styles, and reading strategies. The individuals may have more strength on a certain types of multiple intelligences and have preferences for certain types of thinking styles and reading strategies.

6.2 Pedagogical Implications

As mentioned above, this study aimed to investigate the possible relationships between Chinese English Major EFL undergraduate students' multiple

intelligences, thinking styles, reading strategies and reading performance. The research findings provide some significant pedagogical implications for stakeholders in second or foreign language teaching and learning, which include government departments, institutions, policy-makers, curriculum planners, instructors/teachers, parents, and students/learners.

6.2.1 Government Departments and Institutions

The findings of this study provide significant implications for educational government departments and institutions in China. Individual learner differences (IDs) is one of the important variables in second or foreign language teaching and learning, as well as a key factor in education in general. Government departments, institutions, and schools should take IDs into account in educational activities. To achieve this, the government departments may establish a specialized institution or agency to provide a platform for studying IDs such as multiple intelligences, thinking styles, and reading strategies/language learning strategies. The multiple intelligences approach has been implemented in such countries as USA, Australia, Canada, China, Denmark, Ireland, Holland, and so on (Gardner, 2006). Meanwhile, there have been many examples of successful implementation of multiple intelligences theory in educational programs around the world. Institutions may provide training programs for teacher training on the theories of multiple intelligences, thinking styles and reading strategies/language learning strategies so that they will have clear ideas on what the theories are and how to conduct trainings for students. Moreover, institutions may provide academic projects on the research of IDs. The American Educational

Research Association has had a special interest group (MI-SIG¹) dedicated to multiple intelligences research since 1999, where researchers have presented hundreds of papers providing validation of multiple intelligences in numerous educational contexts (Armstrong, 2009). In addition, the educational literature is replete with examples of individual schools and teachers who have shared in different ways their successes in implementing multiple intelligences theory (Greenhawk, 1997; Campbell & Dickinson, 1999).

6.2.2 Policy-makers and Curriculum Planners

The findings of this study also provide significant implications for policy-makers and curriculum planners for future curriculum reform in China. Policy-makers are the key factor in curriculum reform; they should be experts in education instead of officers in educational government. They are the only authority to determine the language policy in a country. They decide how to develop language benchmarks for schools. In this view, policy-makers should be more alert to the importance of individual learner difference (IDs). The findings of this study have provided some detailed information on Chinese English major EFL learners' strengths of multiple intelligences, their preferences of thinking styles and reading strategies to policy-makers and curriculum planners. In curriculum reform, policy-makers and curriculum planners should have clear ideas on how to integrate curricula with individual learner differences. They should concentrate more on the selections and the design of reading materials.

¹ MI-SIG hosts an online database of over 200 doctoral dissertation abstracts concerned with multiple intelligences that can be accessed at the following URL:
<http://209.216.233.245/aerami/dissertation.php>.

6.2.3 Instructors/Teachers

The results of this study provide significant implications for instructors/teachers in EFL reading classroom. On the one hand, the findings help EFL teachers recognize and have more awareness of the importance of EFL learners' individual differences in classroom teaching and how to instruct and guide learners to make good use of their multiple intelligences, thinking styles, and reading strategies to improve their reading comprehension/performance. On the other hand, EFL teachers should understand their own preferences of thinking styles. They may explore how to match their own thinking styles to their students' preferences in thinking styles. Teacher-student style match/mismatch has impact on students' academic achievements. The effects of style match/mismatch upon students' achievement vary as a function of academic discipline and subject matter (Zhang, 2006). Furthermore, teachers' roles in the EFL classroom should be changed from the traditional ones. In classroom, teachers should not only be instructors, but observers, guides, facilitators and helpers. Teachers should be creative designers in teaching activities so that students' individual strengths and creative abilities can be improved and cultivated. To achieve this, teachers should have a clear idea of the model of teaching they have in their mind and be able to draw upon a broad variety of disciplinary and interdisciplinary sources to create imaginative programs.

6.2.4 Parents

The results of this study also provide significant implications for parents in the education of children. Parents are the key factor in family education in general. Parental involvement in children's education from an early age has a significant effect on educational achievement, and continues to do so into adolescence and adulthood

(Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004). Thus, parents should understand their children's strengths of multiple intelligences and their preference of thinking styles so that they can conduct the training of their children on multiple intelligences, thinking styles in family by a variety of games, everyday life, and homework. In this respect, parents can focus on educational games to motivate their children to develop individual creativity. They can design different games and play with their children in daily life. In addition, parents can guide and encourage their children to play games online, and they can participate in the games as well. With the development of new technology and Internet, the use of online games in learning environments in education is an increasing trend. For school homework, parents can encourage their children to work in different methods and to express their own ideas in different ways.

6.2.5 Students/Learners

The findings of this study provide significant implications for EFL learners themselves as well. Understanding and self-awareness of the strengths of the EFL learners' own multiple intelligences, their preference of thinking styles and reading strategies/language learning strategies will also help them recognize the important value of individual differences and consciously improve them on English learning. On the one hand, students should learn the theories of multiple intelligences (MI), thinking styles (TS), and reading strategies (RS)/language learning strategies (LLS). On the other hand, with the existing inventories of MI, TS, and RS/LLS, students can test and check the strengths of their own MI, their preference of TS and RS/LLS so that they can consciously train themselves in a certain type of intelligence, thinking style, or reading strategy/language learning strategy to improve their language learning.

6.3 Limitations of the Study

The present study involved only undergraduate students majoring in English at Kaili University, Guizhou, which is a newly-built, ethnic and local university in China. So, the findings may not be generalizable to other groups of students or universities.

Another limitation is the instruments of the present study. The online survey resulted in a relatively low response rate of 69.7% of the participants, which could be due to the large number of question items. Anderson (1999) states that questionnaires should be limited to two or four pages unless the respondents are highly motivated, in which case up to sixteen pages are possible. Hence, reducing the length of questionnaires may help the researcher obtain better data.

6.4 Recommendations for Further Research

This study opened a number of avenues for further research on learners' individual differences both in China and other countries. Following are the four recommendations for further research related to the study findings.

First, further research should be conducted on a larger scale online survey on the relationship of learners' multiple intelligences, thinking styles, reading strategies / language learning strategies, and their academic performance. Further research should be conducted to expand the scale of the study to include all levels.

Second, a comparative study should be conducted on the relationship between learners' multiple intelligences, thinking styles, reading strategies/language learning strategies, and their academic performances in different cultural contexts in the further study. That may provide more evidence in further studying the theories of

multiple intelligences, thinking styles, and language learning strategies in general. These comparisons should be made between the participants from different academic years, with undergraduates in the same major, different majors, different countries, and so forth.

Third, a longitudinal study should also be conducted on the relationship between the learners' multiple intelligences, thinking styles, language learning strategies, and academic performance. The change and outcomes of the learners' profiles and performance may provide valuable evidence on the training of multiple intelligences, thing styles, and learning strategies.

Lastly, more studies should be conducted on the exploration of the development of the theories of multiple intelligences, thinking styles, and reading/learning strategies. This is likely to enrich the study of the development of cognitive learning theory.

To sum up, further research conducted in these and other closely related areas would provide a clearer understanding of individual differences and could potentially develop a more effective means for integrating of the multiple intelligences, thinking styles, and reading strategies/learning strategies into the reform of curricula both in L1 and L2 settings. The researcher intends to further explore other variables related to learners' individual differences both in L1 and L2 settings in order to evolve an educational system for learners of the future and the present.

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APPENDIX A

Multiple Intelligences Inventory (MII), Thinking Styles Inventory (TSI), and Reading Strategies Questionnaire (RSQ)

Instructions:

The following questionnaire is about multiple intelligences, thinking styles, reading strategies. It consists of two parts, the first part is about your personal information on ID, gender, nationality, age, etc. the second part is about the three questionnaires on multiple intelligences, thinking styles, and reading strategies. Please read every question/item carefully before you answer it. For the first part, please answer the three questions by filling in the blanks or click “√” in proper spaces; for the second part, please click “√” after each question according to your own situations.

Thank you for your cooperation!!! 😊😊😊

Part I: Personal Information

1. Your ID: _____
2. Your gender: Male Female
3. Your nationality: Han Miao Dong Other Minorities
3. Your age: _____

Part II: Questionnaire on Multiple Intelligences, Thinking Styles, and Reading Strategies

A-1 Multiple Intelligence Inventory (多元智能量表)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
1. Naturalist Intelligence(自然探索智能)					
1.1 I enjoy categorizing things by common traits. (我喜欢按照事物的共同特征对其进行分类。)					
1.2 Ecological issues are important to me. (生态问题对我来说很重要。)					
1.3 Classification helps me make sense of new data. (对事物的分类能帮助我弄清楚新的信息。)					
1.4 I enjoy working in a garden. (我喜欢在花园里工作。)					
1.5 I believe preserving our National Parks is important. (我认为保护国家公园很重要。)					
1.6 Putting things in hierarchies makes sense to me. (事物的层次结构对我很有帮助。)					
1.7 Animals are important in my life. (动物对我来说很重要。)					
1.8 My home has a recycling system in place. (我家里有回收利用装置。)					
1.9 I enjoy studying biology, botany and/or zoology. (我喜欢生物学, 包括植物学和动物学。)					
1.10 I pick up on subtle differences in meaning. (我懂得意义的细微差别。)					
2. Musical Intelligence(音乐智能)					
2.1 I easily pick up on patterns. (我容易了解模式。)					
2.2 I focus in on noise and sounds. (我能够在有噪音或者喧闹的环境下集中注意力。)					
2.3 Moving to a beat is easy for me. (打拍子对我来说很容易。)					

A-1 Multiple Intelligence Inventory (Contd.)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
2.4 I enjoy making music. (我喜欢创作音乐。)					
2.5 I respond to the cadence of poetry. (我会注意诗歌的韵律。)					
2.6 I remember things by putting them in a rhyme. (我会通过韵律来记东西。)					
2.7 Concentration is difficult for me if there is background noise. (如果没有背景音乐, 我很难集中注意力。)					
2.8 Listening to sounds in nature can be very relaxing. (听听自然的声音我会感觉很放松。)					
2.9 Musicals are more engaging to me than dramatic plays. (相对于戏剧, 我更喜欢音乐剧。)					
2.10 Remembering song lyrics is easy for me. (我很容易记住歌词。)					
3. Logical-mathematical Intelligence(逻辑数理智能)					
3.1 I am known for being neat and orderly. (大家都知道我很爱整洁。)					
3.2 Step-by-step directions are a big help. (按部就班对我很有帮助。)					
3.3 Problem solving comes easily to me. (我很容易解决难题。)					
3.4 I get easily frustrated with disorganized people. (我容易对那些没有组织的人感到失望。)					
3.5 I can complete calculations quickly in my head. (我能很快地进行心算。)					
3.6 Logic puzzles are fun. (我喜欢逻辑性的谜语。)					
3.7 I can't begin an assignment until I have all my "ducks in a row". (在我没安排好之前, 我不会从事新的任务。)					
3.8 Structure is a good thing. (组织结构很好。)					

A-1 Multiple Intelligence Inventory (Contd.)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
3.9 I enjoy troubleshooting something that isn't working properly. (我喜欢维修。)					
3.10 Things have to make sense to me or I am dissatisfied. (我要做的事情必须是有意义的，否则我会不高兴。)					
4. Existential Intelligence(生存智慧智能)					
4.1 It is important to see my role in the “big picture” of things. (自己在重要场合的角色/表现对我来说很重要。)					
4.2 I enjoy discussing questions about life. (我喜欢讨论关于生命的问题。)					
4.3 Religion is important to me. (宗教信仰对我来说很重要。)					
4.4 I enjoy viewing art work. (我喜欢观察书刊上的图片。)					
4.5 Relaxation and meditation exercises are rewarding to me. (放松和思考训练对我很有用。)					
4.6 I like traveling to visit inspiring places. (我喜欢到那些令人鼓舞的地方去旅游参观。)					
4.7 I enjoy reading philosophers. (我喜欢读哲学家的书。)					
4.8 Learning new things is easier when I see their real world application. (当我明白一件新东西的实际应用时，我容易学会。)					
4.9 I wonder if there are other forms of intelligent life in the universe. (我想知道宇宙间是否存在智能生命的其他形式。)					
4.10 It is important for me to feel connected to people, ideas and beliefs. (我觉得跟人、观念和信仰连接在一起很重要。)					
5. Interpersonal Intelligence(人际关系智能)					
5.1 I learn best interacting with others. (我会尽量与人交往。)					
5.2 I enjoy informal chat and serious discussion. (我喜欢非正式的聊天，也喜欢很严肃的讨论。)					

A-1 Multiple Intelligence Inventory (Contd.)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
5.3 The more the merrier. (人越多, 我越快乐。)					
5.4 I often serve as a leader among peers and colleagues. (在同行中我常常扮演领导角色。)					
5.5 I value relationships more than ideas or accomplishments. (与想法和成绩相比, 我更注重关系。)					
5.6 Study groups are very productive for me. (小组学习对我来说效果最佳。)					
5.7 I am a “team player”. (我是个团队合作者。)					
5.8 Friends are important to me. (朋友对我很重要。)					
5.9 I belong to more than three clubs or organizations. (我参加至少3个以上的社团或者组织。)					
5.10 I dislike working alone. (我不喜欢单独工作/学习。)					
6. Bodily-Kinesthetic Intelligence(身体智能)					
6.1 I learn by doing. (我喜欢通过动手学习东西。)					
6.2 I enjoy making things with my hands. (凡事我喜欢亲自动手。)					
6.3 Sports are a part of my life. (我喜欢运动/运动是我生活的一部分。)					
6.4 I use gestures and non-verbal cues when I communicate. (跟人交流时, 我会运用体态语言。)					
6.5 Demonstrating is better than explaining. (我认为动作示范比语言解释要好。)					
6.6 I love to dance. (我喜欢跳舞。)					
6.7 I like working with tools. (我喜欢借助工具学习/工作。)					

A-1 Multiple Intelligence Inventory (Contd.)

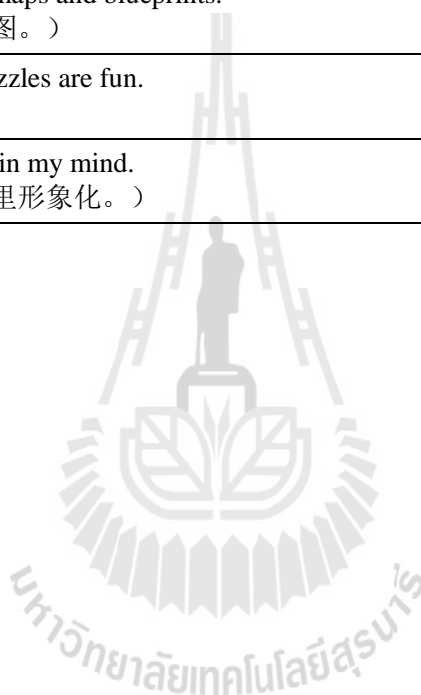
Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
6.8 Inactivity can make me more tired than being very busy. (我喜欢忙碌, 不活动会让我觉得更疲倦。)					
6.9 Hands-on activities are fun. (亲自实践的活动很有趣。)					
6.10 I live an active lifestyle. (我生活得很活跃。)					
7. Verbal/Linguistic Intelligence(语言智能)					
7.1 Foreign languages interest me. (我喜欢学习外语。)					
7.2 I enjoy reading books, magazines and web sites. (我喜欢看书、杂志和浏览网页。)					
7.3 I keep a journal. (我坚持看某一种期刊/杂志。)					
7.4 Word puzzles like crosswords or jumbles are enjoyable. (我很喜欢字谜游戏, 如横纵字谜等。)					
7.5 Taking notes helps me remember and understand. (做笔记能帮助我记忆和理解。)					
7.6 I faithfully contact friends through letters and/or e-mail. (我会坚持通过信件或者e-mail等跟朋友保持联系。)					
7.7 It is easy for me to explain my ideas to others. (我能够很容易的向别人表达/解释我观点和看法。)					
7.8 I write for pleasure. (我乐于写作。)					
7.9 Puns, anagrams and spoonerisms are fun. (我喜欢双关语、片语和首音互换。)					
7.10 I enjoy public speaking and participating in debates. (我喜欢演讲和参加辩论。)					
8. Intrapersonal Intelligence(内省智能)					
8.1 My attitude effects how I learn. (我的态度会影响我的学习。)					

A-1 Multiple Intelligence Inventory (Contd.)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
8.2 I like to be involved in causes that help others. (我喜欢帮助别人。)					
8.3 I am keenly aware of my moral beliefs. (我很清楚我的道德信仰。)					
8.4 I learn best when I have an emotional attachment to the subject. (当我对某一事物有情感依恋时, 学到的东西最多。)					
8.5 Fairness is important to me. (对我而言, 公平很重要。)					
8.6 Social justice issues interest me. (我很关注社会正义问题。)					
8.7 Working alone can be just as productive as working in a group. (小组合作和独立工作/学习的效果没什么区别。)					
8.8 I need to know why I should do something before I agree to do it. (在我同意做某件事情之前, 我需要知道理由。)					
8.9 When I believe in something I give more effort towards it. (我一旦认定某件事, 我会加倍努力去完成。)					
8.10 I am willing to protest or sign a petition to right a wrong. (我乐于主张或者接受纠正错误。)					
9. Visual/Spatial Intelligence(空间智能)					
9.1 Rearranging a room and redecorating are fun for me. (我喜欢重新整理和装饰房间。)					
9.2 I enjoy creating my own works of art. (我喜欢创作艺术作品。)					
9.3 I remember better using graphic organizers. (通过图解可以更好的增强我的记忆效果。)					
9.4 I enjoy all kinds of entertainment media. (我喜欢各种娱乐媒体。)					
9.5 Charts, graphs and tables help me interpret data. (图、图标和表格能够帮助我解读数据。)					
9.6 A music video can make me more interested in a song. (音乐视频会让我对歌曲更感兴趣。)					

A-1 Multiple Intelligence Inventory (Contd.)

Multiple Intelligences Inventory (多元智能量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
9.7 I can recall things as mental pictures. (我会将事物想象成心理画面来记忆。)					
9.8 I am good at reading maps and blueprints. (我擅长看地图和设计图。)					
9.9 Three dimensional puzzles are fun. (我喜欢3D游戏。)					
9.10 I can visualize ideas in my mind. (我能够将事物在大脑里形象化。)					



A-2 Thinking Styles Inventory (思维风格量表)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
1.1 When making decisions, I tend to rely on my own ideas and ways of doing things. (当需要做决策时, 我倾向于按照自己的想法和方式去做。)					
1.2 When discussing or writing down ideas, I follow formal rules of presentation. (当讨论或者书面表达各种想法时, 我遵循规范的语言表达规则。)					
1.3 When discussing or writing down ideas, I like criticizing others' ways of doing things. (当讨论或者书面表达各种想法时, 我喜欢批评他人的做事或方法。)					
1.4 When talking or writing about ideas, I stick to one main idea at a time. (无论是以口头还是书面形式表达思想, 我都坚持一次只围绕一个主题进行。)					
1.5 I like to set priorities for the things I need to do before I start doing them. (我喜欢在开始做事之前把需要处理的事情按先后次序排列好。)					
1.6 When I undertake some task, I am usually equally open to starting by working on any of several things. (当从事某项工作是, 我通常是随机的将要做的几件事情中的任何一件事情作为工作的开头。)					
1.7 When I have many things to do, I do whatever occurs to me first. (当有许多事情要做时, 我先想起哪件就做哪件。)					
1.8 I like situations or tasks in which I am not concerned with details. (我喜欢那些无需考虑细节的工作场合。)					
1.9 I prefer to deal with specific problems rather than with general questions. (我喜欢解决特殊性问题, 而不喜欢解决一般性问题。)					
1.10 I like to control all phases of a project, without having to consult others. (我喜欢对一项工作全面负责, 而不需要与其他人商讨。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
1.11 When starting a task, I like to brainstorm ideas with friends or peers. (当开始进行一项工作时, 我喜欢与朋友或同伴们一起出主意、想办法。)					
1.12 I enjoy working on projects that allow me to try novel ways of doing things. (我喜欢从事那些允许自己尝试新方法的工作。)					
1.13 I like to do things in ways that have been used in the past. (我喜欢采用过去一直使用的方法做事。)					
2.1 When faced with a problem, I use my own ideas and strategies to solve it. (面临一个问题是, 我用自己的想法和策略去解决它。)					
2.2 I am careful to use the proper method to solve any problem. (在解决任何问题时, 我都谨慎的选用适当的方法。)					
2.3 When faced with opposing ideas, I like to decide which is the right way to do something. (当面对各种相互对立的想法时, 我喜欢确定哪一种是做某件事情的正确方式或方法。)					
2.4 I like to deal with major issues or themes, rather than details or facts. (我喜欢处理核心问题, 而不喜欢处理细枝末节的东西。)					
2.5 In talking or writing down ideas, I like to have the issues organized in order of importance. (在谈论或书面表达各种想法时, 我喜欢将各项要点按照重要性程度排列好。)					
2.6 Usually when I have many things to do, I split my time and attention equally among them. (当有许多事情需要做时, 我通常会把我的时间和注意力平均分配到这些事情上去。)					
2.7 I can switch from one task to another easily, because all tasks seem to me to be equally important. (因为对我来说所有的工作都同等重要, 所以我可以很容易地从做一项工作转到做另一项工作。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
2.8 I care more about the general effect than about the details of a task I have to do. (我更关注我必须完成的工作的总体要求而不是工作的细节。)					
2.9 I prefer tasks dealing with a single, concrete problem, rather than general or multiple ones. (我喜欢处理具体的、单一的工作, 而不喜欢处理抽象的或多个问题的工作。)					
2.10 When trying to make a decision, I rely on my own judgment of the situation. (当试图做出一个决策时, 我依赖于自己对当前形势的判断。)					
2.11 I like to participate in activities where I can interact with others as a part of a team. (我喜欢参加那些可以作为集体中的一员与他人相互交流、相互协作的活动。)					
2.12 I like situations where I can try new ways of doing things. (我喜欢那些可以自己尝试用新方法做事的工作场合。)					
2.13 When I am in charge of something, I like to follow methods and ideas used in the past. (当我负责某项工作时, 我喜欢遵循过去曾经用过的方法和观念。)					
3.1 I like to play with my ideas and see how far they go. (我喜欢尝试自己的各种想法, 并且试图了解这些想法的可行性。)					
3.2 I like projects that have a clear structure and a set plan and goal. (我喜欢做那些思路清晰并具有明确的目标和计划的工作。)					
3.3 I like to check and rate opposing points of view or conflicting ideas. (我喜欢比较和评价各种对立的观点或相互冲突的想法。)					
3.4 When trying to finish a task, I tend to ignore problems that come up. (当努力完成一项工作时, 我倾向于忽略其中的新问题。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
3.5 Before starting a project, I like to know the things I have to do and in what order. (在开始一项工作之前, 我喜欢先了解必须要做哪些事情以及完成他们的先后顺序。)					
3.6 I try to have several things going on at once, so that I can shift back and forth between them. (我会试图同时进行几项工作以便于可以相互来回轮换。)					
3.7 When discussing or writing down ideas, I use whatever comes to mind. (当讨论或书面表达各种想法时, 我先想起什么就先说什么。)					
3.8 In doing a task, I like to see how what I do fits into the general picture. (当进行一项工作时, 我喜欢考虑一下我所做的事情将如何满足该项工作的总体要求。)					
3.9 I tend to break down a problem into many smaller ones that I can solve, without looking at the problem as a whole. (我倾向于将一个问题分解为许多可以解决的小问题, 从而无需从整体角度看待问题。)					
3.10 I prefer situations where I can carry out my own ideas, without relying on others. (我比较喜欢可以实施自己想法而无需依赖他人的工作场合。)					
3.11 I like projects in which I can work together with others. (我喜欢那些可以与他人合作来完成的工作。)					
3.12 I like to challenge old ideas or ways of doing things and to seek better ones. (我喜欢向旧的想法或做法提出挑战, 并寻求更好解决问题的方法。)					
3.13 I like tasks and problems that have fixed rules to follow in order to complete them. (我喜欢那些只要按固定规则去做就可以完成的工作/任务。)					
4.1 I like problems where I can try my own way of solving them. (我喜欢那些可以尝试用自己的方法去解决的问题。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
4.2 Before starting a task or project, I check to see what method or procedure should be used. (在开始一项工作之前, 我总是选择好将要采用的方法和程序。)					
4.3 I like projects where I can study and rate different views and ideas. (我喜欢从事那些可以研究和评价不同观点和想法的工作。)					
4.4 When trying to make a decision, I tend to see only one major factor. (当试图做出一个决策时, 我倾向于只考虑一种主要的因素。)					
4.5 In dealing with difficulties, I have a good sense of how important each of them is and what order to tackle them in. (在处理一堆难题时, 我能很好的判断出每个难题的重要程度, 以及处理这些难题的先后顺序。)					
4.6 Usually I do several things at once. (我通常同时做几件事情。)					
4.7 When trying to make a decision, I try to take all points of view into account. (当试图做出一个决策时, 我会尽力将所有的观点都考虑在内。)					
4.8 I tend to emphasize the general aspect of issues or the overall effect of a project. (我倾向于强调问题的总体方面或工作的总体要求。)					
4.9 I like to collect details or specific information for projects I work on. (我喜欢为我从事的工作搜集具体和详细的信息。)					
4.10 When discussing or writing down ideas, I only like to use my own ideas. (当讨论或书面表达各种想法时, 我只喜欢采用自己的想法。)					
4.11 I like situations where I interact with others and everyone works together. (我喜欢那些与他人沟通、交流并大家能合作的工作场合。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
4.12 When faced with a problem, I prefer to try new strategies or methods to solve it. (当遇到问题时, 我比较喜欢尝试新的解决问题的策略和方法。)					
4.13 I stick to standard rules or ways of doing things. (我坚持做事的标准规则和方法。)					
5.1 I like situation where I can use any my own ideas and ways of doing things. (我喜欢那些能用自己的方式和方法做事的工作场合。)					
5.2 I like situations in which my role or the way I participate is clearly defined. (我喜欢那种具有明确的角色分工或参与方式的场合。)					
5.3 When making a decision, I like to compare the opposing points of view. (当需要做决策时, 我喜欢对那些相互对立的观点进行比较。)					
5.4 I like to concentrate on one task at a time. (我喜欢每次都集中精力完成一项工作。)					
5.5 When there are many things to do, I have a clear sense or the order in which to do them. (当有许多事情要做时, 我能明确地判断出先做什么后做什么。)					
5.6 Usually when working on a project, I tend to view almost all aspects of it as equally important. (当开展一项工作时, 我通常倾向于把这项工作的每个方面都看得同等重要。)					
5.7 When there are many important things to do, I try to do as many as I can in whatever time I have. (如果有许多重要工作需要去做, 无论有多少时间我都会尽可能的去多做几件。)					
5.8 I like situations where I can focus on general issues, rather than on specifics. (我比较喜欢那些只需关注总体方面而不是细节问题的工作场合。)					

A-2 Thinking Styles Inventory (Contd.)

Thinking Styles Inventory (思维风格量表)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
5.9 I like problems where I need to pay attention to detail. (我喜欢需要注意细节的问题。)					
5.10 When faced with a problem, I like to work it out by myself. (当遇到问题时, 我喜欢自己一个人解决。)					
5.11 When working on a project, I like to share ideas and get input from other people. (当进行一项工作时, 我喜欢与他人共享自己的想法并了解他人的想法。)					
5.12 I like projects that allow me to look at situation from a new perspective. (我喜欢那些能允许自己从新的角度来看待问题的工作。)					
5.13 I like situations where the role I play is a traditional one. (我喜欢那些自己能充当传统角色的工作场合。)					

A-3 Reading Strategies Questionnaire
(阅读策略问卷)

Reading Strategies Questionnaire (阅读策略问卷)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
1. I visualize images and information when reading. (我脑海里会浮现阅读内容或信息的画面。)					
2. I read the text aloud. (我习惯读出声音。)					
3. I skim a text first to get the main idea and then go back and read it more carefully. (我先浏览文章、了解大意，再回头精读。)					
4. I read a story or dialogue several times until I understand it. (我会反复的阅读一篇文章，直到完全理解。)					
5. I pay attention to the organization of the text, especially headings and subheadings. (我会注意文章的结构，特别是标题和副标题。)					
6. I make ongoing summaries of the reading either in my mind or in the margins of the text. (我会在心中或者文章页边空白处，持续为所读文章做小结。)					
7. I find the meaning of an English word by dividing it into parts that I understand. (当阅读遇到生词时，我会把一个生词分解成几个我认识的部分，以便找出它的意义。)					
8. I try not to translate word-for-word when reading. (阅读时，我会避免逐字翻译。)					
9. I read English newspapers, magazines, or advertisement. (我经常阅读英文报纸、杂志或广告。)					
10. I scan to search for specific details. (我会浏览文章找出特定的细节。)					
11. I use resources to understand a written message, such as dictionaries, word lists, grammar books, or phrase books. (我会利用一些有用资源来帮助阅读，比如词典、单词表、语法书等。)					

A-3 Reading Strategies Questionnaire (Contd.)

Reading Strategies Questionnaire (阅读策略问卷)	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
12. I emphasize the major points through underlining, circling and so on. (当阅读遇到重点时, 我会做一些记号, 比如下划线或画圈等。)					
13. I analyze sentence structure. (我会分析句子结构。)					
14. I translate it from English to Chinese when reading a text. (阅读时, 我会把英文翻译成中文。)					
15. I make use of the questions listed in the back part of the text to understand the text. (我会利用文章后的题目来理解文章/带着问题阅读。)					
16. I stop to recall the points I have read if the text is long. (我读到较长的文章时, 会停下来, 回想读过的重点。)					
17. I use key words or phrases to understand the text. (我会利用关键词或短语来理解文章。)					
18. I make an inference with the text or the main idea. (我会利用文章内容或主旨做推论。)					
19. I try to find things to read for pleasure in English. (我会为了消遣而阅读英语文章。)					
20. I find reading material that is at or near my level. (我会选择适合自己程度的英语文章阅读。)					
21. I plan in advance how I am going to read the text, monitor to see how I am doing, and then check to see how much I understand. (我会事先计划如何阅读、再监督自己做得如何, 最后自我检测。)					
22. I look for opportunities to read as much as possible in English. (我会寻找机会多读英语文章。)					
23. I monitor the comprehension results. (我会监督自己是否理解文章。)					

A-3 Reading Strategies Questionnaire (Contd.)

<p style="text-align: center;">Reading Strategies Questionnaire (阅读策略问卷)</p>	Never true of me (完全不符合我)	Usually not true of me (不怎么符合我)	Somewhat true of me (有点符合我)	Usually true of me (比较符合我)	Always true of me (完全符合我)
24. I make predictions as to what will happen next. (我会预测文章后来可能出现的内容。)					
25. I guess the approximate meaning by using clues from the context of the reading material. (我会通过上下文来猜测句意)					
26. I read English without looking up every new word. (我不会一遇到生词就查词典。)					
27. I use general background knowledge to make guesses. (我会利用背景知识来猜测。)					
28. I skip unknown parts. (我会跳过不懂的地方。)					
29. If I do not understand something in English, I ask other people. (我遇到不懂的地方会请教他人。)					
30. I try to learn about the culture of English speakers. (我会设法了解英语国家的文化。)					

A-4 Samples of Online Questionnaires

I-1.1 I enjoy categorizing things by common traits. (我喜欢按照事物的共同特征对其进行分类。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)
- Usually true of me (比较符合我)
- Always or almost true of me (完全符合我)

I-1.2 Ecological issues are important to me. (我很关注生态问题。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)
- Usually true of me (比较符合我)
- Always or almost true of me (完全符合我)

I-1.3 Classification helps me make sense of new data. (对事物的分类能帮助我弄清楚新的信息。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)
- Usually true of me (比较符合我)
- Always or almost true of me (完全符合我)

II-1.1 When making decisions, I tend to rely on my own ideas and ways of doing things. (当需要做决策时,我倾向于按照自己的想法和方式去做。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)
- Usually true of me (比较符合我)
- Always or almost true of me (完全符合我)

II-1.2 When discussing or writing down ideas, I follow formal rules of presentation. (当讨论或者书面表达各种想法时,我遵循规范的语言表达规则。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)
- Usually true of me (比较符合我)
- Always or almost true of me (完全符合我)

II-1.3 When discussing or writing down ideas, I like criticizing others' ways of doing things. (当讨论或者书面表达各种想法时,我喜欢批评他人的做事方法。)

- Never or almost never true of me (完全不符合我)
- Usually not true of me (不怎么符合我)
- Somewhat true of me (有点符合我)

APPENDIX B

Reading Comprehension Test (RCT)

TEXT A

In the case of mobile phones, change is everything. Recent research indicates that the mobile phone is changing not only our culture, but our very bodies as well. First, let's talk about culture. The difference between the mobile phone and its parent, the fixed-line phone, you get whoever answers it.

This has several implications. The most common one, however, and perhaps the thing that has changed our culture forever, is the "meeting" influence. People no longer need to make firm plans about when and where to meet. Twenty years ago, a Friday night would need to be arranged in advance. You needed enough time to allow everyone to get from their place of work to the first meeting place. Now, however, a night out can be arranged on the run. It is no longer "see you there at 8", but "text me around 8 and we'll see where we all are".

Texting changes people as well. In their paper, "insights into the Social and Psychological Effects of SMS Text Messaging", two British researchers distinguished between two types of mobile phone users: the "talkers" and the "texters"-those who prefer voice to text message and those who prefer text to voice. They found that the mobile phone's individuality and privacy gave texters the ability to express a whole new outer personality. Texters were likely to report that their family would be surprised if they were to read their texts. This suggests that texting allowed texters to present a self-image that differed from the one familiar to those who knew them well.

Another scientist wrote of the changes that mobiles have brought to body language. There are two kinds that people use while speaking on the phone. There is the "speakeasy": the head is held high, in a self-confident way, chatting away. And there is the "spacemaker": these people focus on themselves and keep out other people.

Who can blame them? Phone meetings get cancelled or reformed and camera-phones intrude on people's privacy. So, it is understandable if your mobile makes you nervous. But perhaps you needn't worry so much. After all, it is good to talk.

1. When people plan to meet nowadays, they _____.
 - A. arrange the meeting place beforehand
 - B. postpone fixing the place till last minute
 - C. seldom care about when and where to meet
 - D. still love to work out detailed meeting plans.
2. According to the two British researchers, the social and psychological effect are mostly likely to be seen on _____.
 - A. TALKERS B. the "speakeasy" C. the "spacemaker" D. texters
3. We can infer from the passage that the texts sent by texters are _____.
 - A. quite revealing B. well written
 - C. unacceptable by others D. shocking to others
4. According to the passage, who is afraid of being heard while talking on the mobile?
 - A. talkers B. the speakeasy C. the spacemaker D. texters
5. An appropriate title for the passage might be
 - A. the SMS effect B. cultural implication of mobile use
 - C. change in the use of the mobile D. body language and the mobile phone!

TEXT B

Over the last 25 years, British society has changed a great deal-or at least many parts of it have. In some ways, however, very little has changed, particularly where attitudes are concerned. Ideas about social class-whether a person is “working-class” or “middle-class” -are one area in which changes have been extremely slow.

In the past, the working-class tended to be paid less than middle-class people, such as teachers and doctors. As a result of this and also of the fact that workers’ jobs were generally much less secure, distinct differences in life-styles and attitudes came into existence. The typical working man would collect his wages on Friday evening and then, it was widely believed, having given his wife her “housekeeping” , would go out and squander the rest on beer and betting.

The stereotype of what a middle-class man did with his money was perhaps nearer the truth. He was-and still is - inclined to take a longer-term view. Not only did he regard buying a house of these provide him and his family with security. Only in very few cases did workers have the opportunity (or the education and training) to make such long-term plans.

Nowadays, a great deal has changed. In a large number of cases factory workers earn as much, if not more, than their middle-class supervisors. Social security and laws to improve century, have made it less necessary than before to worry about “tomorrow” . Working-class people seem slowly to be losing the feeling of inferiority they had in the past. In fact there has been a growing tendency in the past few years for the middle-classes to feel slightly ashamed of their position.

The changes in both life-styles and attitudes are probably most easily seen amongst younger people. They generally tend to share very similar tastes in music and clothes, they spend their money in having a good time, and save for holidays or longer-term plans when necessary. There seems to be much less difference than in previous generations. Nevertheless, we still have a wide gap between the well-paid (whatever the type of job they may have) and the low-paid. As long as this gap exists, there will always be a possibility that new conflicts and jealousies will emerge, or rather that the old conflicts will re-appear, but between different groups.

6. Which of the following is seen as the cause of class differences in the past?
- A. Life style and occupation B. Attitude and income
C. Income and job security D. Job security and hobbies
7. The writer seems to suggest that the description of _____ is closer to truth?
- A. middle - class ways of spending money
B. working-class ways of spending the weekend
C. working-class drinking habits D. middle-class attitudes
8. According to the passage, which of the following is not a typical feature of the middle -class?
- A. desiring for security B. Making long term plans
C. having priorities in life D. saving money
9. Working -class people's sense of security increased as a result of all the following factors except for _____.
- A. better social security B. more job opportunities
C. higher living standard D. better legal protection.
10. Which of the following statement is incorrect?
- A. Changes are slowly taking place in all sectors of the British society.
B. The gap between working -class and middle- class young people is narrowing.
C. Different in income will remain but those in occupation will disappear.
D. Middle-class people may sometimes feel inferior to working-class people!

TEXT C

For several days I saw little of Mr. Rochester. In the morning he seemed much occupied with business, and in the afternoon gentlemen from the neighborhood called and sometimes stayed to dine with him. When his foot was well enough, he rode out a great deal.

During this time, all my knowledge of him was limited to occasional meetings about the house, when he would sometimes pass me coldly, and sometimes bow and smile. His changes of manner did not offend me, because I saw that I had nothing to do with the cause of them.

One evening, several days later, I was invited to talk to Mr. Rochester after dinner. He was sitting in his armchair, and looked not quite so severe, and much less gloomy. There was a smile on his lips, and his eyes were bright, probably with wine. As I was looking at him, he suddenly turned, and asked me, “do you think I’ m handsome, Miss Eyre?”

The answer somehow slipped from my tongue before I realized it: “No, sir.”

“ah, you really are unusual! You are a quiet, serious little person, but you can be almost rude.”

“Sir, I’ m sorry. I should have said that beauty doesn’t matter, or something like that,”

“no, you shouldn’t’ t! I see, you criticize my appearance, and then you stab me in the back! You have honesty and feeling. There are not many girls like you. But perhaps I go too fast. Perhaps you have awful faults to counterbalance your few good points.

I thought to myself that he might have too. He seemed to read my mind, and said quickly,” yes, you’re right. I have plenty of faults. I went the wrong way when I was twenty-one, and have never found the right path again. I might have been very different. I might have been as good as you, and perhaps wiser. I am not a bad man, take my word for it, but I have done wrong. It wasn’t my character, but circumstances which were to blame. Why do I tell you all this? Because you are the sort of person people tell their problems and secrets to, because you are sympathetic and give them hope.”

It seemed he had quite a lot to talk to me. He didn't seem to like to finish the talk quickly, as was the case for the first time.

"Don't be afraid of me, Miss Eyre." He continued. "You don't relax or laugh very much, perhaps because of the effect Lowood school has had on you. But in time you will be more natural with me, and laugh, and speak freely. You're like a bird in a cage. When you get out of the cage, you'll fly very high. Good night."

11. At the beginning Miss Eyre's impressions of Mr. Rochester were all except _____.
A. busy B. sociable C. friendly D. changeable
12. In "...and all my knowledge of him was limited to occasional meetings about the house, ..." , the word about means _____.
A. around B. on C. outside D. concerning.
13. Why did Mr. Rochester say " ..and the you stab me in the back!" the (7th para.)
A. because Jane had intended to kill him with a knife
B. because Jane had intended to be more critical.
C. because Jane had regretted having talked to him
D. because Jane had said something else to correct herself.
14. From what Mr. Rochester told Miss Eyre, we can conclude that he wanted to _____. A. tell her all his troubles B. tell her his life experience.
C. change her opinion of him D. change his circumstances
15. At the end of the passage, Mr. Rochester sounded _____.
A. rude B. cold C. friendly D. encouraging.

TEXT D

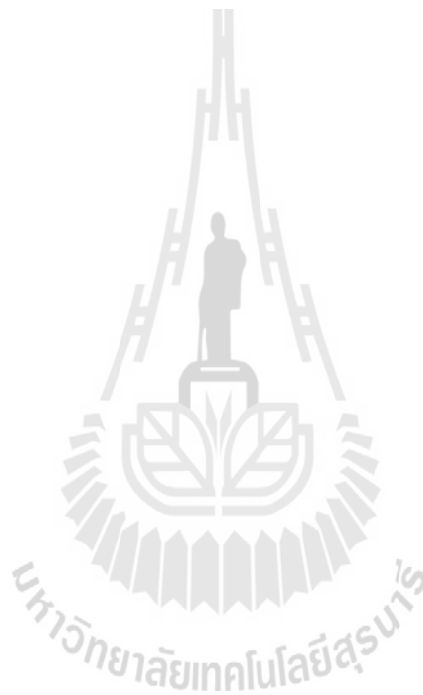
The ideal companion machine-the computer- would not only look, feel, and sound friendly but would also be programmed to behave in a pleasant manner. Those qualities that make interaction comfortable, and yet the machine would remain slightly unpredictable and therefore interesting. In its first encounter it might be somewhat hesitant, but as it came to know the user it would progress to a more relaxed and intimate style. The machine would not be a passive participant but would add its own suggestions, information, and opinions; it would sometimes take the initiative in developing or changing the topic and would have a personality of its own.

Friendships are not made in a day, and the computer would be more acceptable as a friend if it imitated the gradual changes that occur when one person is getting to know another. At an appropriate time it might also express the kind of affection that stimulates attachment and intimacy. The whole process would be accomplished in a subtle way to avoid giving an impression of over-familiarity that would be likely to produce irritation. After experiencing a wealth of powerful, well-timed friendship indicators, the user would be very likely to accept the computer as far more than a machine and might well come to regard it as a friend.

An artificial relationship of this type would provide many of the benefits that could continue from previous discussions. It would have a familiarity with the user's life as revealed in earlier contact, and it would be understanding and good-humored. The computers' own personality would be lively and impressive, and it would develop in response to that of the user. With features such as these, the machine might indeed become a very attractive social partner.

16. Which of the following is not a feature of the ideal companion machine?
- A. Active in communication B. Attractive in personality.
C. Enjoyable in performance D. Unpredictable in behavior
17. The computer would develop friendships with humans in a (n) _____ way.
- A. Quick B. unpredictable C. productive D. inconspicuous.
18. Which of the following aspects is not mentioned when the passage discusses the benefits of artificial relationships?
- A. Being able to pick up an interesting conversation.

- B. Being sensitive to earlier contact.
 - C. Being ready to learn about the person's life
 - D. Having a pleasant and adaptable personality
19. Throughout the passage, the author is _____ in his attitude toward the computer.
- A. favorable B. critical C. vague D. hesitant
20. Which might be the most appropriate title of the passage?
- A. Artificial relationships B. How to form intimate relationships
 - C. The affectionate machine D. Humans and computers



APPENDIX C

TEST FOR ENGLISH MAJORS (2012) GRADE FOUR

(TIME LIMIT: 135 MIN)

PART I DICTATION [15 MIN]

Listen to the following passage. Altogether the passage will be read to you four times. During the first reading, which will be done at normal speed, listen and try to understand the meaning. For the second and third readings, the passage will be read sentence by sentence, or phrase by phrase, with intervals of 15 seconds. The last reading will be done at normal speed again and during this time you should check your work. You will then be given 2 minutes to check through your work once more. Please write the whole passage on ANSWER SHEET ONE.

PART II LISTENING COMPREHENSION [20 MIN]

In Sections A, B and C you will hear everything ONCE ONLY. Listen carefully and then answer the questions that follow. Mark the best answer to each question on Answer Sheet Two.

SECTION A CONVERSATIONS

In this section you will hear several conversations. Listen to the conversations carefully and then answer the questions that follow.

Questions 1 to 3 are based on the following conversation. At the end of the conversation, you will be given 15 seconds to answer the questions. Now, listen to the conversation.

1. The Ethical Consumer Research Association will provide information to shoppers on ____.

A. product price. B. product quality. C. manufacturers. D. production methods.

2. According to the conversation, an ethical shopper should

- A. ask for others' advice before buying things.
- B. consider the worth of something to be bought.
- C. postpone buying things whenever possible.
- D. search for things that are less costly.

3. According to the conversation, ethical shoppers can be best described as

- A. shrewd. B. thrifty. C. extravagant. D. cautious.

Questions 4 to 7 are based on the following conversation. At the end of the conversation, you will be given 20 seconds to answer the questions. Now, listen to the conversation.

4. Which of the following statements is CORRECT about Mary?

- A. She is enjoying her language study.
- B. She is enjoying her management study.
- C. She is not feeling very well at the moment.
- D. She is not happy about her study pressure.

5. What does Mary think of the course initially?

- A. It is useful. B. It is difficult. C. It is challenging. D. It is interesting.

6. What is Mary's problem of living in a family house?

- A. She dislikes the food she eats. B. She is unable to sleep well.
- C. She has no chance to make friends. D. She finds the rent high.

7. Which of the following is Mr. Davies' advice?

- A. To try to make more friends. B. To try to change accommodation.
- C. To spend more time on English. D. To stop attending language classes.

Questions 8 to 10 are based on the following conversation. At the end of the conversation, you will be given 15 seconds to answer the questions. Now, listen to the conversation.

8. According to the conversation, the day is special because
- A. many people are surfing the net on that day.
 - B. it is an anniversary of the internet.
 - C. the net brought about no changes until that day.
 - D. big changes will take place on that day.
9. We learn from the conversation that people
- A. cannot live without the internet. B. cannot work without the internet.
 - C. all use the internet to keep in touch. D. have varied opinions about internet use.
10. At the end of the conversation, the speakers talk about
- A. the future of the internet. B. the type of office furniture.
 - C. when changes will come. D. how people will use the internet.

SECTION B PASSAGES

In this section, you will hear several passages. Listen to the passages carefully and then answer the questions that follow.

Questions 11 to 13 are based on the following passage. At the end of the passage, you will be given 15 seconds to answer the questions. Now, listen to the passage.

11. In order to open a bank account, you need to produce ___ in addition to your passport.
- A. a library card B. a registration form C. a telephone bill D. a receipt
12. Which of the following might NOT be included in the “utility bill”?
- A. Rent. B. Gas. C. Water. D. Telephone.
13. According to the passage, what can one do in the post office?
- A. Getting contact details. B. Obtaining tax forms.
 - C. Paying housing rents. D. Applying for loans.

Questions 14 to 17 are based on the following passage. At the end of the

passage, you will be given 20 seconds to answer the questions. Now, listen to the passage.

14. According to the passage, 'scheduling' means that you
- A. need to be efficient in work. B. plan your work properly.
C. try to finish work ahead of time. D. know how to work in teams.
15. According to the passage, one of the activities to relax could be
- A. protecting wild animals. B. spending time with your family.
C. learning how to read efficiently. D. learning how to do gardening.
16. One of the ways to reduce stress is to
- A. do better than anyone else. B. fulfill high ambitions in one's work.
C. work and have reasonable aims. D. start with a relatively low aim.
17. According to the passage, to reduce stress has something to do with the following EXCEPT
- A. one's position. B. one's interest. C. one's health. D. one's mood.

Questions 18 to 20 are based on the following passage. At the end of the passage, you will be given 15 seconds to answer the questions. Now, listen to the passage.

18. According to the passage, new words tend to come from
- A. world politics. B. advances in science. C. areas of life. D. all the above.
19. The passage explains the larger and richer vocabulary of English mainly from a viewpoint.
- A. historical B. cultural C. commercial D. colonial
20. According to the passage, which of the following statements best describes the English language?
- A. It is outdated in grammar. B. It accepts new words from science.
C. It has begun taking in new words. D. It tends to embrace new words.

SECTION C NEWS BROADCAST

In this section, you will hear several news items. Listen to them carefully and then answer the questions that follow.

Questions 21 and 22 are based ON the following news. At the end of the news item, you will be given 10 seconds to answer the questions. Now listen to the news.

21. Where was the marble statue found?
- A. Out in the sea. B. Inside a bath house.
C. On a cliff along the coast. D. On the coast outside Jerusalem.
22. Which of the following best describes the condition of the statue?
- A. It was incomplete. B. It was recent artwork.
C. It was fairly tall. D. It was in pieces.

Questions 23 and 24 are based on the following news. At the end of the news item, you will be given 10 seconds to answer the questions. Now, listen to the news.

23. The rescue efforts concentrated mainly on
- A. the U. S. -Canada border B. snow-stricken regions.
C. highways. D. city streets.
24. According to the news, the last group of people might have been stranded in their vehicles for more than ____ hours before being rescued.
- A. 24 B. 25 C. 40 D. 48

Questions 25 and 26 are based on the following news. At the end of the news item, you will be given 10 seconds to answer the questions. Now, listen to the news.

25. According to the 2006 anti-smoking restrictions, smoking was NOT allowed in ____
- A. offices. B. restaurants. C. bars. D. school playgrounds.
26. According to the news, which of the following groups reacts negatively to the new law?

- A. Television producers. B. Hotel owners.
C. Medical workers. D. Hospital management.

Questions 27 and 28 are based on the following news. At the end of the news item, you will be given 10 seconds to answer the questions. Now, listen to the news.

27. According to the news, who first discovered the fraud?
A. A client. B. A bank manager. C. The police. D. Bank headquarters.
28. When did the bank employee hand himself in?
A. A month before the fraud was discovered.
B. A day before the fraud was discovered.
C. A day after the police launched investigation.
D. A month after he transferred the money.

Question 29 is based on the following news. At the end of the news item, you will be given 5 seconds to answer the question. Now, listen to the news.

29. What is this news item mainly about?
A. How to open Hotmail accounts. B. How to retrieve missing e-mails.
C. New e-mail service by Microsoft. D. Problems and complaints about e-mails.

Question 30 is based on the following news. At the end of the news item, you will be given 5 seconds to answer the question. Now, listen to the news.

30. Compared with 2009, which of the following figures remained about the same in 2010?
A. Number of tickets sold. B. Box office revenues.
C. Attendance rate. D. Number of cinemas.

PART III CLOZE 【15 MIN】

Decide which of the choices given below would best complete the passage if inserted in the corresponding blanks. Mark the best choice for each blank on Answer Sheet Two.

The earthquake of 26th December 2004 resulted in one of the worst natural disasters in living memory. It was a (31) _____ underwater quake and occurred in the Indian Ocean. It (32) _____ coastlines, communities and brought death to many people.

Why do earthquakes happen?

The surface of the earth has not always looked as it does today; it is moving(33)_____ (although very slowly)and has done so for billions of years. This is one(34)_____ of earthquakes, when one section of the earth (tectonic plate)(35)_____ another. Scientists can predict where but not(36)_____ this might happen and the area between plates is called a fault line. On one fault line in Kobe, Japan in 1923 over 200,000 people were killed. (37)_____, earthquakes do not always happen on fault lines, (38)_____ is why they are so dangerous and (39)_____.

Where do volcanoes happen?

Volcanoes happen where the earth's(40)_____ is thin: lava, dust and gases(41)_____ from beneath the earth. They can rise into a huge cone shape like a mountain and erupt, (42)_____ they can be so violent(43)_____ they just explode directly from the earth with no warning. There are 1511(44)'_____' volcanoes in the world. This means that they may(45)_____ be dangerous. In 1985 the Colombian volcano Nevado del Ruiz erupted. The lava melted a glacier and sent tons of mud(46)_____ the town below. Twenty thousand people died. Natural disasters like volcanic eruptions are often unpredictable. We regularly do not know when they(47)_____ pen, or (48)_____ where they will happen. In the future, scientists may be able to watch and predict(49)_____ before they happen. This could(50)_____ many lives.

31. A. massive B. significant C. great D. grand
 32. A. changed B. converted C. destroyed D. transformed
 33. A. frequently B. continuously C. regularly D. periodically
 34. A. source B. reason C. movement D. cause
 35. A. collides with B. confronts with C. meets with D. faces with

36. A. how B. why C. when D. what
37. A. Generally B. However C. Similarly D. Anyway
38. A. that B. it C. this D. which
39. A. unpredictable B. unaccountable C. inevitable D. irresistible
40. A. surface B. appearance C. crust D. cover
41. A. flowed out B. burst out C. leaked out D. trickled out
42. A. or B. and C. nor D. but
43. A. like B. for C. as D. that
44. A. living B. active C. alive D. live
45. A. relatively B. hardly C. still D. gradually
46. A. down B. on C. across D. beyond
47. A. are to B. should C. must D. might
48. A. else B. even C. though D. whether
49. A. accidents B. incidents C. occasions D. events
50. A. rescue B. save C. preserve D. shelter

PART IV GRAMMAR & VOCABULARY 【15 MIN】

There are thirty sentences in this section. Beneath each sentence there are four words, phrases or statements marked A, B, C and D. Choose one word, phrase or statement that best completes the sentence. Mark your answers on Answer Sheet Two.

51. Which of the following sentences is INCORRECT?
- A. Twenty miles seems like a long walk to him.
- B. No one except his supporters agree with him.
- C. Neither Julia nor I were going to the party.
- D. Few students in my class are really lazy.

52. Which of the following determiners(限定词)can be placed before both singular count nouns and plural count nouns?
A. many a B. few C. such D. the next
53. Which of the following reflexive pronouns(反身代词)is used as an appositive(同位语)?
A. He promised himself rapid progress.
B. The manager herself will interview Mary.
C. I have nothing to say for myself.
D. They quarreled themselves red in the face.
54. My boss ordered that the legal documents _____ to him before lunch.
A. be sent B. were sent C. were to be sent D. must be sent
55. Which of the following sentences expresses WILLINGNESS?
A. By now she will be eating dinner. B. I shall never do that again.
C. My brother will help you with the luggage. D. You shall get a promotion.
56. Which of the following sentences is INCORRECT?
A. How strange feelings they are! B. How dare you speak to me like that!
C. What noise they are making! D. What a mess we are in!
57. Which of the italicized parts functions as a subject?
A. We never doubt that her brother is honest.
B. The problem is not who will go but who will stay.
C. You must give it back to whoever it belongs to.
D. It is clear that the crime was done deliberately.
58. Which of the italicized parts functions as an object?
A. He doesn't like the idea of my speaking at the meeting.
B. It is no use your pretending not to know the matter.
C. My parents strongly object to my going out alone at night.
D. Her falling into the river was the climax of the whole trip.

59. All the following sentences have an appositive EXCEPT
- A. She bought herself a pair of new shoes.
 - B. Only one problem still remains-the food.
 - C. My friends all understand and support me.
 - D. She liked her current job, teaching English.
60. Which of the following best explains the meaning of “Shall we buy the tickets first”?
- A. He said that we were going to buy the tickets first.
 - B. He requested that we buy the tickets first.
 - C. He suggested that we buy the tickets first.
 - D. He advised us to buy the tickets first.
61. Which of the following contains an adverbial clause of cause?
- A. I got a job as soon as I left university.
 - B. As there was no answer, I wrote again.
 - C. You must do the exercises as I show you.
 - D. Wealthy as he is, Mark is not a happy man.
62. Which of the following prepositional phrases can function as an adverbial?
- A. Are you sure of Simon's disappearance?
 - B. The man with a beard is talking to the manager.
 - C. Every precaution was taken against the failure of the plan.
 - D. Despite the rain, everyone enjoyed the trip.
63. A: Mother. you promised to take me out. B: Well _____
- A. so I did! B. so did I. C. so I do! D. so do I
64. Which of the following prepositional phrases is an adverbial of concession?
- A. They used the box for keeping treasures.
 - B. I stepped aside for her to get in first.
 - C. For all that he seems to dislike me, I still like him.
 - D. The parents bought a birthday cake for their son.

65. Which of the following sentences is INCORRECT?
- A. Poultry are very expensive in the city.
 - B. New machinery were introduced in the factory.
 - C. The police are investigating the murder case.
 - D. The militia were called out to rescue flood victims.
66. The girl cannot come to school today on account of the flu. The underlined part means ____.
- A. concerning
 - B. because of
 - C. as to
 - D. for
67. Mary and John are busy looking for a hotel for their wedding ____.
- A. meal
 - B. snack
 - C. refreshment
 - D. banquet
68. Mini-skirts first ____ in the 1960s.
- A. caught out
 - B. caught in
 - C. caught on
 - D. caught up
69. That outburst at the meeting was ____ of his bad temper.
- A. illustrative
 - B. explanatory
 - C. expository
 - D. revealing
70. The earthquake refugees are ____ for food and blankets.
- A. desirous
 - B. ambitious
 - C. seriously off
 - D. badly off
71. When Linda heard the good news she tried to sound casual, but her excitement was obvious. The underlined part means ____.
- A. uncaring
 - B. disinterested
 - C. without plan
 - D. without warning
72. Most Chinese people went to work by bike within living ____.
- A. mind
 - B. knowledge
 - C. memory
 - D. scope
73. The speaker was very good at ____ his ideas during the discussion.
- A. putting aside
 - B. putting across
 - C. putting back
 - D. putting off
74. The food is good at this hotel, but the ____ is poor; the waiters don't seem to be well trained.
- A. maintenance
 - B. repair
 - C. charge
 - D. service
75. Slavery was ____ in America in the 19th century.
- A. abolished
 - B. cancelled
 - C. abandoned
 - D. terminated

76. Mercifully, I was able to complete all I had to do within a few days. The underlined part means _____.
A. efficiently B. surprisingly C. fortunately D. shortly
77. The boys in the dorm _____ a coin to decide who would clean the floor.
A. held B. tossed C. put D. collected
78. The patterns of spoken language are _____ from those of writing.
A. distinct B. distinctive C. distinguished D. distinguishing
79. A(n)_____ shape has four straight sides at 90° to each other, two of which are much longer than the other two.
A. square B. oval C. oblong D. circular
80. I'd like to have a _____ word with his parents.
A. peaceful B. quiet C. silent D. personal

PART V READING COMPREHENSION 【25 MIN】

In this section there are four passages followed by questions or unfinished statements, each with four suggested answers marked A,B,C and D. Choose the one that you think is the best answer. Mark your answers on Answer Sheet Two.

TEXT A

Saying “thank you” is probably the first thing most of us learn to do in a foreign language. After all, we’re brought up to be polite, and it is important to make a good impression upon other people—especially across national divides.

So, what exactly are you supposed to say when “thank you” is only the 20th most popular way to express gratitude? According to a recent survey, 19 other ways of expressing appreciation finished ahead of “thank you” in a poll of 3,000 people.

Pollsters found almost half of those asked preferred the more informal “cheers”, while others liked to use such expressions as “ta”, “great” and “nice one”.

So, just what is the appropriate form of words to express your thanks?

Fortunately, the clue is in the language itself. “Cheers”, despite its popularity, is considered an informal way to say thank you—and this is a definite clue as to when you can best use it.

For instance, when going for a drink with friends, a smile and a “cheers” by way of thanks is not only appropriate to the situation, it is also culturally accurate.

“Ta”, originated from the Danish word “tak”, was the second-most popular expression of thanks, and is also commonly used in informal situations, along with phrases such as “nice one”, and “brilliant”. Interestingly, one word that didn’t make it into the top 20 was “thanks”. Thank you is shorter, more informal cousin.

“Thanks” can be useful, as it is able to bridge the divide between the formality of “thank you” and the downright relaxed “cheers”.

Certain words can double as an expression of thanks as well as delight. Again, the words themselves offer the clue as to when best to use them.

For example, words like “awesome”, “brilliant” and “you star” featured highly in the new poll and they can hint at both your pleasure at someone's action, as well as serving to express your thanks. If you are on the receiving end of a “new” thank you, you can respond with a simple “no problem”, or “sure”.

Of course, in certain circumstances, a simple wave, nod or smile may be appropriate. For instance, if a car driver slows down to let you cross the road, simply raising your hand in acknowledgement is enough to show that you appreciate the driver's consideration.

Sometimes, formality is necessary, and “thank you” is still the best choice in such situations.

But students should not worry about when exactly to use certain expressions.

Many people in Western countries are worried that good manners are in decline. People are tired of seeing their acts of kindness and service pass without comment. So don’t think that your “thank you” was clumsy or awkwardly

formal. The chances are, if you said “thank you”, you made someone’s day. You star.

81. We can tell from the results of the poll that
- A. people are unconcerned about politeness nowadays.
 - B. “thank you” remains the best expression of gratitude.
 - C. there is a variety of expressions of appreciation.
 - D. there are more formal expressions than informal ones.
82. Which word/phrase does NOT appear in the top 20?
- A. Cheers. B. Thanks. C. Brilliant. D. You star.
83. According to the passage, which is an appropriate response to “awesome” or “brilliant”?
- A. Thanks. B. Cheers. C. Nice one. D. Sure.
84. According to the passage, the way in which we express our gratitude depends on all the following EXCEPT
- A. gender. B. formality. C. culture. D. circumstance.
85. In the last paragraph the author encourages people to
- A. continue their acts of kindness. B. behave themselves well.
 - C. show their gratitude to others. D. stop worrying about bad manners.

TEXT B

From 2007 to 2010, American households lost \$11 trillion in real estate, savings, and stocks More than half of all U. S. workers either lost their jobs or were forced to take cuts in hours or pay during the recession. The worst may be behind them now, but the shocking losses of the past few years have reshaped nearly every facet of their lives—how they live, work, and spend—even the way they think about the future.

For Cindy, the recession began when her husband was relocated to Rhinelander, Wisconsin. by his company forcing the family to move in a hurry. The couple bought a new house but were unable to sell their two-bedroom home in Big

Lake, Minnesota. With two mortgages(抵押借款) and two young children to care for, Cindy couldn't imagine how to stretch her husband's paycheck to keep her family fed.

Then she stumbled upon an online community called Blotanical, a forum for gardeners, many with an interest in sustainability. "The more I read and discussed these practices, the more I realized this would help not only our budget but also our health," she says.

Cindy admits that before the recession, she was a city girl with no interest in growing her own dinner. "I grew flowers mostly—I didn't think about plants that weren't visually interesting." But to stretch her budget, she began putting in vegetables and fruit—everything from strawberry beds to apple trees—and as her first seedlings grew, her spirits lifted. She no longer thinks of gardening and making her own jams as just a money saver; they're a genuine pleasure. "It's brought us closer together as a family, too," she says. Her kids voluntarily pitch in with(主动帮助)the garden work, and the family cooks together instead of eating out. The food tastes better—it's fresher and organic—and the garden handily fulfills its original purpose: cost cutting. Now she spends about \$200 to \$300 a month on groceries. less than half of the \$650 a month that she used to lay out.

After discovering how resourceful she can be in tough times, Cindy is no longer easily discouraged. "It makes me feel proud to be able to say I made it myself," she says. "I feel accomplished, and I'm more confident about attempting things I've never done before. " Now she avoids convenience stores and has begun learning to knit, quilt, and make her own soap. "I don't think I would have ever begun this journey if it weren't for the recession," she says. "I have a feeling that from now on, it will affect my family's health and happiness for the better. "

86. We learn from the first paragraph that the recession
- A. affected Americans in certain occupations.
 - B. had great impact on Americans' work and life.
 - C. had only brought huge losses in savings and stocks.

- D. is over with some of the losses recovered.
87. What made the family's financial situation even worse was that they
- A. moved to Rhinelander in a hurry.
 - B. had two children to raise.
 - C. didn't know anyone in Rhinelander.
 - D. couldn't sell their home in Big Lake.
88. Which of the following statements is CORRECT?
- A. Cindy had seen the benefits of gardening in a different way.
 - B. Cindy had developed a hobby of gardening before the recession.
 - C. Cindy had already had a keen interest in sustainability.
 - D. Cindy had already planned to meet the gardeners.
89. In addition, Cindy views gardening as a genuine pleasure because gardening
- A. helped her cut living costs almost by half.
 - B. enabled her to make her own jams.
 - C. built up family ties and kids' enthusiasm.
 - D. enabled her to know more about plants.
90. What does Cindy think of the difficult times she has gone through?
- A. It gave the couple and their kids a tough lesson.
 - B. It gave her confidence and optimism.
 - C. It would come again and affect the family.
 - D. It left a lasting psychological impact on the family.

TEXT C

"I'm a little worried about my future," said Dustin Hoffman in *The Graduate*. He should be so lucky. All he had to worry about was whether to have an affair with Mrs Robinson. In the sixties, that was the sum total of post-graduation anxiety syndrome.

Hoffman's modern counterparts are not so fortunate. The Mrs Robinsons

aren't sitting around at home any more, seducing graduates. They are out in the workplace, doing the high-powered jobs the graduates want, but cannot get. For those fresh out of university, desperate for work but unable to get it, there is a big imbalance between supply and demand. And there is no narrowing of the gap in sight.

The latest unemployment figures show that 746,000 of 18-24 year-olds are unemployed— a record rate of 18 per cent. Many of those will have graduated this summer. They are not panicking yet, but as the job rejections mount up, they are beginning to feel alarmed.

Of course, it is easy to blame the Government and, in particular, the target that Labour has long trumpeted---50 per cent of school-leavers in higher education. That was not too smart. The Government has not only failed to meet its target—the actual figure is still closer to 40 per cent— but it has raised expectations to unrealistic levels.

Parents feel as badly let down as the young people themselves. Middle-class families see their graduate offspring on the dole(救济金)queue and wonder why they bothered paying school fees. Working-class families feel an even keener sense of disappointment. For many such families, getting a child into university was the fulfillment of a lifelong dream. It represented upward social and financial mobility. It was proof that they were living in a dynamic, economically successful country. That dream does not seem so rosy now.

Graduate unemployment is not, ultimately, a political problem ready to be solved. Job-creation schemes for graduates are very low down in ministerial in-trays. If David Cameron's Conservatives had a brilliant idea for guaranteeing every graduate a well-paid job, they would have unveiled it by now. It is a social problem, though a more deep-seated social problem than people perhaps realize.

91. The author begins with an episode from *The Graduate* in order to

- A. support the fact that more women are working now.

- B. show that few graduates started working right after graduation.
 C. demonstrate that there were much fewer graduates than now.
 D. emphasize the sharp contrast between now and then.
92. With regard to job opportunities for young graduates, the author sounds
 A. pessimistic. B. hopeful. C. indifferent. D. furious.
93. The author is ____ the Labour Government's target: 50% of school leavers in higher education.
 A. in favour of B. doubtful about C. strongly critical of D. mildly critical of
94. Which of the following statements about parents' feelings is CORRECT?
 A. Working—class parents feel just as disappointed.
 B. Parents and their children feel equally disappointed.
 C. Middle—class parents feel more disappointed.
 D. Parents feel more disappointed than their children.
95. Towards the end of the passage, the author implies that
 A. there will be job-creation schemes for graduates.
 B. graduate unemployment is more of a political issue.
 C. graduate unemployment is both a political and a social issue.
 D. the Conservatives are doing far from enough to solve the issue.

TEXT D

No matter how many times you have seen images of the golden mask of boyking Tutankhamen, come face to face with it in Egypt's Cairo museum, and you will suck in your breath.

It was on Nov 4, 1923, that British archaeologist Howard Carter stumbled on a stone at the base of the tomb of another pharaoh(法老)in Luxor that eventually led to a sealed doorway.

Then, on Nov 23, Carter found a second door and when he stuck his head through it, what he saw was to stun the world. Inside lay the great stone coffin, enclosing three chests of gilded wood.

A few months later, when a crane lifted its granite cover and one coffin after another was removed, Carter found a solid block of gold weighing 110kg. In it was the mummy(木乃伊) of the 19-year-old Tutankhamen, covered in gold with that splendid funeral mask. And all this lay buried for more than 3,000 years.

Months after my trip to Egypt, I can relive the rush of emotion I felt and sense the hush that descended on the crammed Cairo museum's Tutankhamen gallery.

Cairo, a dusty city of 20 million people, is a place where time seems to both stand still and rush into utter chaos. It is a place where the ancient and contemporary happily go along on parallel tracks.

Take the Great Pyramids of Giza, sitting on the western edge of the city. Even as the setting sun silhouettes these gigantic structures against the great desert expanse, a call for prayer floats over semi-finished apartment blocks filled with the activity of city life.

While careful planning for the afterlife may lie buried underground in Cairo, it is noise and confusion on the streets. Donkey carts battle for space with pedestrians and the only operative road rule is “might is right.” But it is a city that is full of life—from the small roadside restaurants to the coffee shops where men and women smoke the shisha(水烟壺).

Donkey carts piled high with flat-breads magically find their way in and out the maddening traffic; young women in long skirts and headscarves hold hands with young men in open collar shirts, while conversations dwell on Kuwait's chances at the soccer World Cup.

96. According to the context, “suck in your breath” means “feel a sense of _____”.

A. awe B. horror C. doubt D. delight

97. Which of the following statements about the discovery of the mummy is INCORRECT?

A. The mummy was first discovered by a British archaeologist.

B. The discovery of the mummy came as a surprise.

- C. The mummy was found lying right inside the stone coffin.
 D. The masked mummy was covered in gold.
98. Which word CANNOT be used to describe the city of Cairo?
 A. Crowdedness. B. Quiet. C. Noise. D. Confusion.
99. Which pair of words/phrases indicates contrast?
 A. Gigantic structure; great desert expanse
 B. A call for prayer; men and women with the shisha
 C. Chaos; maddening
 D. Coffee shops; pyramids
100. What is the author's attitude towards Cairo?
 A. Positive. B. Objective. C. Negative. D. Not clear

PART VI WRITING 【45 MIN】

SECTION A COMPOSITION [35 MIN]

The Dragon Boat Festival(端午节)is one of the important national festivals in China. Write on ANSWER SHEET THREE a composition of about 200 words on the following topic:

The Dragon Boat Festival

First, you should tell what you know about the festival.

Second, you should describe how you or other people usually observe the festival.

Marks will be awarded for content, organization, language and appropriateness. Failure to follow the instructions may result in a loss of marks.

SECTION B NOTE-WRITING [10 MIN]

Write on ANSWER SHEET THREE a note of about 50-60 words based on the following situation:

The winter vacation was over, and you came back by train yesterday. Your

friend (Michael or Lucy) went to the railway station to meet you and helped cleaning your dorm. Now, write him/her a note, expressing your gratitude and offering your help in return.

Marks will be awarded for content organization, language and appropriateness.

Key:

I. DICTATION

ECOTOURISM

Nowadays, many of us try to live in a way that will damage the environment as little as possible. We recycle our newspapers and bottles, we take public transport to get to work, we try to buy locally produced fruit and vegetables, and we want to take these attitudes on holiday with us. This is why alternative forms of tourism are becoming popular in the world. There are a lot of names for these new forms of tourism: responsible tourism, nature tourism, adventure tourism, educational tourism and more.

Although everyone may have a different definition, most people agree that these new forms of tourism should do the following: first, they should conserve the wildlife and culture of the area; second, they should benefit the local people; third, they should make a profit without destroying natural resources; and finally they should provide an experience that tourists want to pay for.

II LISTENING COMPREHENSION

1-5: CBBDA 6-10: CBBDA 11-15: CADBD

16-20: CADAD 21-25: DACDA 26-30: BACDB

III CLOZE

31-35: ACBDA 36-40: CBDAC 41-45: BADBC 46-50: ADBDB

IV GRAMMAR AND VOCABULARY

51-55: BCBAD 56-60: ADCAC 61-70: BDCAD

71-75: BCBDA 76-80: CBACB

V READING COMPREHENSION

81-85: CBDAC 86-90: BDACB 91-95: DADBB 96-100: ACBAB

APPENDIX D

Item Analysis (IAS) and Item-Objective Congruence

Index (IOC) Check of the Chinese Translation of the

Online Questionnaires

Items	Expert No. 1	Expert No. 2	Expert No. 3	Result
1.....	1	0	1	✓
2.....	1	1	1	✓
3.....	1	1	1	✓
4.....	1	1	1	✓
5.....	1	1	1	✓
6.....	0	0	0	X
7.....	1	1	1	✓
8.....	1	1	1	✓
9.....	1	1	1	✓
10.....	1	1	1	✓
11.....	0	0	1	X
12.....	1	1	1	✓
13.....	1	1	1	✓
14.....	1	0	1	✓
15.....	1	1	0	X
16.....	0	1	0	✓
17.....	1	0	1	✓
18.....	1	1	1	✓
19.....	-1	0	-1	X
20.....	1	1	1	✓
21.....	0	0	1	✓
22.....	1	1	1	✓
23.....	1	1	1	✓
24.....	1	0	1	✓
25.....	0	1	1	✓
26.....	1	1	1	✓
27.....	1	1	0	✓
28.....	0	1	1	✓
29.....	0	1	0	✓
30.....	1	1	1	✓
31.....	1	1	1	✓
32.....	1	1	0	✓

33.....	0	0	0	X
34.....	1	1	1	✓
35.....	1	1	1	✓
36.....	1	0	1	✓
37.....	1	1	1	✓
38.....	1	1	1	✓
39.....	1	0	0	X
40.....	1	1	1	✓
41.....	0	1	1	✓
42.....	1	1	1	✓
43.....	1	1	1	✓
44.....	0	0	0	X
45.....	1	1	1	✓
46.....	1	0	1	✓
47.....	1	1	1	✓
48.....	1	1	1	✓
49.....	1	1	1	✓
50.....	0	1	1	✓
51.....	1	1	1	✓
52.....	1	1	0	✓
53.....	1	1	1	✓
54.....	1	1	1	✓
55.....	0	0	0	X
56.....	1	1	1	✓
57.....	0	0	0	X
58.....	1	1	1	✓
59.....	1	0	1	✓
60.....	1	1	1	✓
61.....	1	1	1	✓
62.....	1	1	1	✓
63.....	1	1	1	✓
64.....	1	1	1	✓
65.....	1	1	1	✓
66.....	1	1	1	✓
67.....	1	1	1	✓
68.....	1	1	1	✓
69.....	0	0	1	X
70.....	1	1	1	✓
71.....	1	1	1	✓
72.....	1	1	1	✓
73.....	0	1	1	✓
74.....	1	1	0	✓
75.....	1	1	1	✓
76.....	1	1	1	✓
77.....	1	1	1	✓
78.....	1	1	1	✓

79.....	1	1	1	✓
80.....	1	1	1	✓
81.....	1	0	1	✓
82.....	1	1	1	✓
83.....	1	1	1	✓
84.....	1	1	1	✓
85.....	1	1	1	✓
86.....	1	1	1	✓
87.....	1	1	1	✓
88.....	1	0	1	✓
89.....	1	1	1	✓
90.....	1	1	1	✓
91.....	1	1	1	✓
92.....	1	1	1	✓
93.....	1	1	1	✓
94.....	1	0	1	✓
95.....	1	1	1	✓
96.....	0	1	0	X
97.....	1	1	1	✓
98.....	1	1	1	✓
99.....	1	1	1	✓
100.....	1	1	1	✓
101.....	0	0	0	X
102.....	1	1	1	✓
103.....	1	1	1	✓
104.....	1	1	1	✓
105.....	1	1	1	✓
106.....	0	1	1	✓
107.....	1	0	1	✓
108.....	1	1	1	✓
109.....	0	0	1	X
110.....	1	1	1	✓
111.....	1	0	0	X
112.....	1	1	1	✓
113.....	1	1	0	✓
114.....	1	1	1	✓
115.....	0	1	1	✓
116.....	1	1	1	✓
117.....	1	1	1	✓
118.....	1	1	1	✓
119.....	0	1	0	✓
120.....	1	1	1	✓
121.....	1	0	1	✓
122.....	1	1	0	✓
123.....	1	0	1	✓
124.....	1	1	1	✓

125.....	0	1	1	✓
126.....	1	0	1	✓
127.....	1	1	1	✓
128.....	1	1	1	✓
129.....	0	0	0	X
130.....	1	1	1	✓
131.....	0	1	1	✓
132.....	1	1	1	✓
133.....	1	1	1	✓
134.....	0	0	0	X
135.....	1	1	1	✓
136.....	1	0	1	✓
137.....	1	1	1	✓
138.....	1	1	1	✓
139.....	1	1	1	✓
140.....	0	1	1	✓
141.....	1	1	1	✓
142.....	1	1	0	✓
143.....	1	1	1	✓
144.....	1	1	1	✓
145.....	0	1	0	X
146.....	1	1	1	✓
147.....	0	0	0	X
148.....	1	1	1	✓
149.....	1	0	1	✓
150.....	1	1	1	✓
151.....	1	1	1	✓
152.....	1	1	1	✓
153.....	1	1	1	✓
154.....	1	1	1	✓
155.....	1	1	1	✓
156.....	1	1	1	✓
157.....	1	1	1	✓
158.....	1	1	1	✓
159.....	1	0	0	X
160.....	1	1	1	✓
161.....	1	1	1	✓
162.....	1	1	0	✓
163.....	1	1	1	✓
164.....	1	1	1	✓
165.....	0	1	0	X
166.....	1	1	1	✓
167.....	0	0	0	X
168.....	1	1	1	✓
169.....	1	0	1	✓
170.....	0	1	1	✓

171.....	1	0	1	✓
172.....	1	1	1	✓
173.....	1	1	1	✓
174.....	1	1	0	✓
175.....	1	1	1	✓
176.....	1	0	1	✓
177.....	1	1	1	✓
178.....	1	0	1	✓
179.....	1	1	1	✓
180.....	1	1	1	✓
181.....	1	0	1	✓
182.....	1	1	1	✓
183.....	1	1	1	✓
184.....	1	1	0	✓
185.....	1	1	1	✓
Total	176	172	174	167

- Notes: 1. "1" for the item is congruence with objective; 2. "-1" for the item is not congruence with objective; 3. "0" for the expert not sure

- **Result of IOC:**

$$(IOC = \Sigma R / N)$$

Item number: 185 $R=176+172+174=522$ (Scores from experts)

$N=3$ (Numbers of expert) $IOC=522/3=174$

Percentage: $174/185 \times 100\% = 94.05\%$

APPENDIX E

Output Independent Samples T-test (for Gender)

Group Statistics					
	student's gender	N	Mean	Std. Deviation	Std. Error Mean
Mean of Naturalistic Intelligence	male	66	3.3470	.45037	.05544
	female	147	3.3306	.47594	.03926
Mean of Musical Intelligence	male	66	3.3879	.57900	.07127
	female	147	3.4354	.56868	.04690
Mean of Logical Intelligence	male	66	3.6439	.37257	.04586
	female	147	3.7599	.44347	.03658
Mean of Existential Intelligence	male	66	3.3697	.48674	.05991
	female	147	3.4027	.52901	.04363
Mean of Interpersonal Intelligence	male	66	3.6303	.34012	.04187
	female	147	3.8061	.40548	.03344
Mean of Bodily-kinesthetic Intelligence	male	66	3.6045	.58162	.07159
	female	147	3.5429	.60974	.05029
Mean of Linguistic Intelligence	male	66	3.9727	.38572	.04748
	female	147	4.0218	.34033	.02807
Mean of Intrapersonal Intelligence	male	66	3.4712	.49108	.06045
	female	147	3.3306	.38794	.03200
Mean of Spatial/Visual Intelligence	male	66	3.2682	.54552	.06715
	female	147	3.2626	.52801	.04355
Mean of Legislative Style	male	66	3.4061	.55244	.06800
	female	147	3.4816	.60489	.04989
Mean of Executive Style	male	66	3.4576	.55444	.06825
	female	147	3.5170	.58933	.04861
Mean of Judicial Style	male	66	3.1667	.51151	.06296
	female	147	3.1905	.59878	.04939
Mean of Monarchic Style	male	66	2.9212	.54787	.06744
	female	147	2.9619	.53087	.04379
	female	147	2.9619	.53087	.04379
Mean of Hierarchic Style	male	66	3.4727	.55651	.06850
	female	147	3.4966	.67453	.05563
Mean of Oligarchic Style	male	66	3.0152	.51478	.06336
	female	147	2.9388	.58502	.04825
Mean of Anarchic Style	male	66	3.0909	.47352	.05829
	female	147	3.1156	.58094	.04792
Mean of Global Style	male	66	3.6000	.47198	.05810
	female	147	3.7714	.51338	.04234
Mean of Local Style	male	66	2.9061	.54374	.06693

	female	147	2.6748	.58296	.04808
Mean of Internal Style	male	66	3.0909	.84938	.10455
	female	147	2.8490	.77304	.06376
Mean of External Style	male	66	3.4364	.69981	.08614
	female	147	3.6803	.66566	.05490
Mean of Liberal Style	male	66	3.2667	.61901	.07620
	female	147	3.3061	.68057	.05613
Mean of Conservative Style	male	66	2.5636	.67474	.08305
	female	147	2.5102	.64114	.05288
Mean of Cognitive Strategies	male	66	3.5539	.42410	.05220
	female	147	3.4860	.42244	.03484
Mean of Compensation Strategies	male	66	3.3636	.58062	.07147
	female	147	3.4422	.62471	.05153
Mean of Social Strategies	male	66	3.4773	.61037	.07513
	female	147	3.3333	.68829	.05677
Mean of Metacognitive Strategies	male	66	3.3545	.60337	.07427
	female	147	3.2435	.69775	.05755



Independent Samples Test

		LTfor EV		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CID	
									Lower	Upper
Mean of	EVA	.141	.708	.236	211	.814	.01636	.06938	-.12040	.15311
Naturalistic Intelligence	EVNA			.241	131.775	.810	.01636	.06793	-.11801	.15073
Mean of Musical Intelligence	EVA	.502	.479	-.561	211	.576	-.04750	.08473	-.21453	.11954
	EVNA			-.557	123.210	.579	-.04750	.08532	-.21638	.12139
Mean of Logical Intelligence	EVA	3.394	.067	-1.850	211	.066	-.11592	.06266	-.23945	.00760
	EVNA			-1.976	147.437	.050	-.11592	.05866	-.23185	.00000
Mean of Existential Intelligence	EVA	.466	.496	-.432	211	.666	-.03302	.07651	-.18384	.11780
	EVNA			-.446	135.288	.657	-.03302	.07412	-.17960	.11355
Mean of Interpersonal Intelligence	EVA	.998	.319	-3.070	211	.002	-.17582	.05727	-.28872	-.06292
	EVNA			-3.281	147.655	.001	-.17582	.05358	-.28171	-.06993
Mean of Bodily-kinesthetic Intelligence	EVA	.157	.692	.692	211	.489	.06169	.08908	-.11392	.23729
	EVNA			.705	130.795	.482	.06169	.08749	-.11139	.23477
Mean of Linguistic Intelligence	EVA	.694	.406	-.933	211	.352	-.04904	.05259	-.15271	.05463
	EVNA			-.889	112.272	.376	-.04904	.05516	-.15832	.06024
Mean of Intrapersonal Intelligence	EVA	8.000	.005	2.246	211	.026	.14060	.06259	.01722	.26398
	EVNA			2.056	102.929	.042	.14060	.06839	.00496	.27624
Mean of Spatial/Visual Intelligence	EVA	.176	.675	.071	211	.944	.00560	.07904	-.15022	.16141
	EVNA			.070	121.603	.944	.00560	.08003	-.15284	.16404
Mean of Legislative Style	EVA	1.418	.235	-.866	211	.388	-.07557	.08731	-.24768	.09653
	EVNA			-.896	136.236	.372	-.07557	.08434	-.24236	.09121
Mean of Executive Style	EVA	1.020	.314	-.693	211	.489	-.05943	.08576	-.22849	.10963
	EVNA			-.709	132.492	.479	-.05943	.08379	-.22516	.10630
Mean of Judicial Style	EVA	1.050	.307	-.280	211	.780	-.02381	.08495	-.19126	.14365
	EVNA			-.298	145.130	.766	-.02381	.08002	-.18197	.13435

Mean of Monarchic Style	EVA	.176	.675	-.512	211	.609	-.04069	.07944	-.19730	.11591
	EVNA			-.506	121.723	.614	-.04069	.08041	-.19987	.11848
Mean of Hierarchic Style	EVA	1.417	.235	-.252	211	.802	-.02387	.09490	-.21095	.16321
	EVNA			-.271	149.977	.787	-.02387	.08825	-.19824	.15050
Mean of Oligarchic Style	EVA	2.807	.095	.913	211	.362	.07638	.08361	-.08845	.24120
	EVNA			.959	141.115	.339	.07638	.07965	-.08108	.23383
Mean of Anarchic Style	EVA	3.866	.051	-.303	211	.762	-.02474	.08151	-.18541	.13593
	EVNA			-.328	151.695	.743	-.02474	.07545	-.17381	.12434
Mean of Global Style	EVA	1.223	.270	-2.309	211	.022	-.17143	.07423	-.31776	-.02510
	EVNA			-2.385	135.388	.018	-.17143	.07189	-.31360	-.02926
Mean of Local Style	EVA	.563	.454	2.732	211	.007	.23123	.08463	.06440	.39806
	EVNA			2.806	133.565	.006	.23123	.08241	.06823	.39423
Mean of Internal Style	EVA	.256	.613	2.048	211	.042	.24193	.11814	.00904	.47482
	EVNA			1.976	115.240	.051	.24193	.12246	-.00063	.48449
Mean of External Style	EVA	.011	.917	-2.434	211	.016	-.24391	.10022	-.44146	-.04635
	EVNA			-2.388	119.739	.019	-.24391	.10215	-.44616	-.04166
Mean of Liberal Style	EVA	.741	.390	-.402	211	.688	-.03946	.09812	-.23288	.15397
	EVNA			-.417	136.765	.677	-.03946	.09464	-.22660	.14769
Mean of Conservative Style	EVA	.289	.591	.553	211	.581	.05343	.09656	-.13691	.24377
	EVNA			.543	119.628	.588	.05343	.09846	-.14152	.24838
Mean of Cognitive Strategies	EVA	.020	.888	1.083	211	.280	.06786	.06267	-.05568	.19139
	EVNA			1.081	124.785	.282	.06786	.06276	-.05636	.19207
Mean of Compensation Strategies	EVA	.082	.775	-.867	211	.387	-.07854	.09060	-.25714	.10006
	EVNA			-.891	134.011	.374	-.07854	.08811	-.25280	.09572
Mean of Social Strategies	EVA	1.143	.286	1.460	211	.146	.14394	.09857	-.05037	.33825
	EVNA			1.529	140.080	.129	.14394	.09417	-.04223	.33011
Mean of Metacognitive Strategies	EVA	2.083	.150	1.118	211	.265	.11101	.09929	-.08472	.30673
	EVNA			1.181	143.463	.239	.11101	.09396	-.07471	.29673

APPENDIX F

Output of One-Way ANOVA (for Ethnicity)

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Mean of Naturalistic Intelligence	Chinese Han	93	3.3613	.47914	.04968	3.2626	3.4600	2.10	4.40
	Miao	55	3.3073	.34203	.04612	3.2148	3.3997	2.60	4.20
	Dong	27	3.3667	.52623	.10127	3.1585	3.5748	2.10	4.40
	Other minorities	38	3.2921	.55575	.09015	3.1094	3.4748	2.20	4.30
	Total	213	3.3357	.46717	.03201	3.2726	3.3988	2.10	4.40
Mean of Musical Intelligence	Chinese Han	93	3.4129	.53796	.05578	3.3021	3.5237	2.20	4.40
	Miao	55	3.2800	.63520	.08565	3.1083	3.4517	2.10	4.30
	Dong	27	3.4963	.51849	.09978	3.2912	3.7014	2.40	4.50
	Other minorities	38	3.5895	.55449	.08995	3.4072	3.7717	2.30	4.50
	Total	213	3.4207	.57095	.03912	3.3435	3.4978	2.10	4.50
Mean of Logical Intelligence	Chinese Han	93	3.7355	.44713	.04636	3.6434	3.8276	2.70	4.60
	Miao	55	3.6455	.41313	.05571	3.5338	3.7571	2.40	4.60
	Dong	27	3.7889	.38364	.07383	3.6371	3.9407	3.00	4.40
	Other minorities	38	3.7632	.41552	.06741	3.6266	3.8997	3.00	4.60
	Total	213	3.7239	.42531	.02914	3.6665	3.7814	2.40	4.60
Mean of Existential Intelligence	Chinese Han	93	3.3409	.50309	.05217	3.2373	3.4445	1.90	4.50
	Miao	55	3.3964	.52138	.07030	3.2554	3.5373	2.00	4.50
	Dong	27	3.5111	.43353	.08343	3.3396	3.6826	2.70	4.20
	Other minorities	38	3.4289	.58767	.09533	3.2358	3.6221	1.60	4.50
	Total	213	3.3925	.51537	.03531	3.3229	3.4621	1.60	4.50
Mean of Interpersonal Intelligence	Chinese Han	93	3.8409	.40813	.04232	3.7568	3.9249	2.90	5.00
	Miao	55	3.6345	.38016	.05126	3.5318	3.7373	2.50	4.60
	Dong	27	3.7000	.30382	.05847	3.5798	3.8202	3.00	4.30
	Other minorities	38	3.7395	.39697	.06440	3.6090	3.8700	2.50	4.70
	Total	213	3.7516	.39413	.02701	3.6984	3.8049	2.50	5.00

Mean of Bodily-kinesthetic Intelligence	Chinese Han	93	3.5591	.61099	.06336	3.4333	3.6850	2.00	4.70
	Miao	55	3.5091	.59013	.07957	3.3496	3.6686	2.00	4.90
	Dong	27	3.6407	.51010	.09817	3.4390	3.8425	2.70	4.60
	Other minorities	38	3.5895	.66120	.10726	3.3721	3.8068	2.20	4.80
	Total	213	3.5620	.60048	.04114	3.4809	3.6431	2.00	4.90
Mean of Linguistic Intelligence	Chinese Han	93	4.0054	.33047	.03427	3.9373	4.0734	3.20	4.80
	Miao	55	3.9673	.39770	.05363	3.8598	4.0748	2.80	4.60
	Dong	27	3.9926	.34854	.06708	3.8547	4.1305	3.20	4.60
	Other minorities	38	4.0763	.35522	.05762	3.9596	4.1931	3.20	4.70
	Total	213	4.0066	.35482	.02431	3.9586	4.0545	2.80	4.80
Mean of Intrapersonal Intelligence	Chinese Han	93	3.2430	.32850	.03406	3.1754	3.3107	2.50	3.90
	Miao	55	3.5982	.52121	.07028	3.4573	3.7391	2.60	4.50
	Dong	27	3.5148	.33248	.06399	3.3833	3.6463	2.80	4.10
	Other minorities	38	3.2711	.39518	.06411	3.1412	3.4009	2.40	4.20
	Total	213	3.3742	.42642	.02922	3.3166	3.4318	2.40	4.50
Mean of Spatial/Visual Intelligence	Chinese Han	93	3.2376	.52356	.05429	3.1298	3.3455	1.90	4.40
	Miao	55	3.2291	.54354	.07329	3.0822	3.3760	2.00	4.30
	Dong	27	3.3704	.43396	.08352	3.1987	3.5420	2.60	4.10
	Other minorities	38	3.3053	.60357	.09791	3.1069	3.5037	2.20	4.30
	Total	213	3.2643	.53221	.03647	3.1924	3.3362	1.90	4.40
Mean of Legislative Style	Chinese Han	93	3.3785	.59743	.06195	3.2555	3.5015	1.80	5.00
	Miao	55	3.5382	.59239	.07988	3.3780	3.6983	2.20	5.00
	Dong	27	3.5259	.50581	.09734	3.3258	3.7260	2.60	5.00
	Other minorities	38	3.4895	.61459	.09970	3.2875	3.6915	2.40	4.60
	Total	213	3.4582	.58888	.04035	3.3787	3.5378	1.80	5.00
Mean of Executive Style	Chinese Han	93	3.4430	.54121	.05612	3.3315	3.5545	1.60	5.00
	Miao	55	3.5236	.56502	.07619	3.3709	3.6764	2.00	5.00
	Dong	27	3.6370	.63739	.12267	3.3849	3.8892	2.00	4.80
	Other minorities	38	3.5000	.64221	.10418	3.2889	3.7111	2.60	5.00
	Total	213	3.4986	.57810	.03961	3.4205	3.5767	1.60	5.00
Mean of Judicial Style	Chinese Han	93	3.1204	.55806	.05787	3.0055	3.2354	1.60	5.00
	Miao	55	3.2509	.58780	.07926	3.0920	3.4098	2.00	5.00
	Dong	27	3.3778	.55562	.10693	3.1580	3.5976	2.80	5.00
	Other minorities	38	3.1000	.57281	.09292	2.9117	3.2883	2.00	4.80
	Total	213	3.1831	.57207	.03920	3.1058	3.2604	1.60	5.00

Mean of Monarchic Style	Chinese Han	93	2.8817	.52273	.05420	2.7741	2.9894	1.80	4.40
	Miao	55	2.9964	.58054	.07828	2.8394	3.1533	2.00	5.00
	Dong	27	3.0444	.59829	.11514	2.8078	3.2811	2.00	5.00
	Other minorities	38	2.9789	.44306	.07187	2.8333	3.1246	1.80	4.00
	Total	213	2.9493	.53523	.03667	2.8770	3.0216	1.80	5.00
Mean of Hierarchic Style	Chinese Han	93	3.3677	.63745	.06610	3.2365	3.4990	1.60	5.00
	Miao	55	3.6218	.57177	.07710	3.4672	3.7764	2.20	5.00
	Dong	27	3.6370	.57389	.11044	3.4100	3.8641	2.60	5.00
	Other minorities	38	3.4895	.73624	.11943	3.2475	3.7315	1.80	5.00
	Total	213	3.4892	.63908	.04379	3.4029	3.5755	1.60	5.00
Mean of Oligarchic Style	Chinese Han	93	2.8688	.54012	.05601	2.7576	2.9801	1.80	4.60
	Miao	55	3.1055	.56155	.07572	2.9536	3.2573	1.80	5.00
	Dong	27	3.1333	.57379	.11043	2.9064	3.3603	2.20	4.40
	Other minorities	38	2.8632	.56779	.09211	2.6765	3.0498	1.20	4.00
	Total	213	2.9624	.56410	.03865	2.8863	3.0386	1.20	5.00
Mean of Anarchic Style	Chinese Han	93	3.0000	.52420	.05436	2.8920	3.1080	1.80	5.00
	Miao	55	3.2836	.57309	.07728	3.1287	3.4386	2.20	5.00
	Dong	27	3.2074	.60379	.11620	2.9686	3.4463	2.20	5.00
	Other minorities	38	3.0474	.47062	.07634	2.8927	3.2021	1.60	4.00
	Total	213	3.1080	.54891	.03761	3.0338	3.1821	1.60	5.00
Mean of Global Style	Chinese Han	93	3.6989	.49662	.05150	3.5966	3.8012	2.00	4.80
	Miao	55	3.7891	.44124	.05950	3.6698	3.9084	3.00	4.60
	Dong	27	3.8222	.57468	.11060	3.5949	4.0496	2.20	4.80
	Other minorities	38	3.5895	.55204	.08955	3.4080	3.7709	2.20	4.40
	Total	213	3.7183	.50609	.03468	3.6500	3.7867	2.00	4.80
Mean of Local Style	Chinese Han	93	2.6710	.59756	.06196	2.5479	2.7940	1.40	4.20
	Miao	55	2.7600	.53111	.07161	2.6164	2.9036	1.60	4.00
	Dong	27	2.7481	.61417	.11820	2.5052	2.9911	1.60	4.20
	Other minorities	38	2.9105	.56511	.09167	2.7248	3.0963	1.80	4.00
	Total	213	2.7465	.57981	.03973	2.6682	2.8248	1.40	4.20
Mean of Inernal Style	Chinese Han	93	2.6645	.73494	.07621	2.5132	2.8159	1.20	5.00
	Miao	55	3.1345	.61831	.08337	2.9674	3.3017	1.80	4.00
	Dong	27	3.7333	.76460	.14715	3.4309	4.0358	2.00	4.40
	Other minorities	38	2.6789	.78160	.12679	2.4220	2.9359	1.40	4.00
	Total	213	2.9239	.80332	.05504	2.8154	3.0324	1.20	5.00

Mean of External Style	Chinese Han	93	3.8000	.59050	.06123	3.6784	3.9216	2.20	5.00
	Miao	55	3.4909	.66979	.09031	3.3098	3.6720	2.20	4.80
	Dong	27	3.1037	.72403	.13934	2.8173	3.3901	1.80	4.40
	Other minorities	38	3.6474	.70125	.11376	3.4169	3.8779	2.20	5.00
	Total	213	3.6047	.68417	.04688	3.5123	3.6971	1.80	5.00
Mean of Liberal Style	Chinese Han	93	3.2774	.64944	.06734	3.1437	3.4112	2.00	5.00
	Miao	55	3.2218	.69992	.09438	3.0326	3.4110	1.20	4.40
	Dong	27	3.2667	.74421	.14322	2.9723	3.5611	1.80	5.00
	Other minorities	38	3.4579	.55974	.09080	3.2739	3.6419	2.00	4.80
	Total	213	3.2939	.66091	.04528	3.2046	3.3832	1.20	5.00
Mean of Conservative Style	Chinese Han	93	2.4946	.64444	.06682	2.3619	2.6273	1.20	4.20
	Miao	55	2.5600	.71326	.09618	2.3672	2.7528	1.40	4.40
	Dong	27	2.5926	.48511	.09336	2.4007	2.7845	1.80	3.40
	Other minorities	38	2.5105	.69078	.11206	2.2835	2.7376	1.40	4.00
	Total	213	2.5268	.65061	.04458	2.4389	2.6146	1.20	4.40
Mean of Cognitive Strategies	Chinese Han	93	3.4379	.38436	.03986	3.3587	3.5170	2.56	4.56
	Miao	55	3.5657	.46297	.06243	3.4405	3.6908	2.67	5.00
	Dong	27	3.5864	.33274	.06404	3.4548	3.7180	2.78	4.17
	Other minorities	38	3.5351	.49529	.08035	3.3723	3.6979	2.28	4.78
	Total	213	3.5070	.42313	.02899	3.4499	3.5642	2.28	5.00
Mean of Compensation Strategies	Chinese Han	93	3.3957	.59122	.06131	3.2739	3.5175	1.40	4.80
	Miao	55	3.3927	.61459	.08287	3.2266	3.5589	2.20	5.00
	Dong	27	3.4519	.56184	.10813	3.2296	3.6741	2.40	4.60
	Other minorities	38	3.4842	.70001	.11356	3.2541	3.7143	2.20	5.00
	Total	213	3.4178	.61111	.04187	3.3353	3.5004	1.40	5.00
Mean of Social Strategies	Chinese Han	93	3.3226	.65792	.06822	3.1871	3.4581	1.50	5.00
	Miao	55	3.4182	.61436	.08284	3.2521	3.5843	2.00	5.00
	Dong	27	3.4259	.68925	.13265	3.1533	3.6986	2.00	5.00
	Other minorities	38	3.4211	.75808	.12298	3.1719	3.6702	1.50	5.00
	Total	213	3.3779	.66703	.04570	3.2878	3.4680	1.50	5.00
Mean of Metacognitive Strategies	Chinese Han	93	3.2280	.69819	.07240	3.0842	3.3717	1.00	4.60
	Miao	55	3.3236	.63420	.08552	3.1522	3.4951	1.80	4.80
	Dong	27	3.3333	.54349	.10460	3.1183	3.5483	2.00	4.40
	Other minorities	38	3.2947	.74650	.12110	3.0494	3.5401	1.80	4.60
	Total	213	3.2779	.67049	.04594	3.1874	3.3685	1.00	4.80

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mean of Naturalistic Intelligence	Between Groups	.203	3	.068	.308	.820
	Within Groups	46.065	209	.220		
	Total	46.269	212			
Mean of Musical Intelligence	Between Groups	2.331	3	.777	2.432	.066
	Within Groups	66.778	209	.320		
	Total	69.109	212			
Mean of Logical Intelligence	Between Groups	.524	3	.175	.964	.411
	Within Groups	37.824	209	.181		
	Total	38.348	212			
Mean of Existential Intelligence	Between Groups	.679	3	.226	.851	.468
	Within Groups	55.629	209	.266		
	Total	56.308	212			

Mean of Interpersonal Intelligence	Between Groups	1.572	3	.524	3.492	.017
	Within Groups	31.360	209	.150		
	Total	32.932	212			
Mean of Bodily-kinesthetic Intelligence	Between Groups	.351	3	.117	.321	.810
	Within Groups	76.091	209	.364		
	Total	76.442	212			
Mean of Linguistic Intelligence	Between Groups	.275	3	.092	.726	.538
	Within Groups	26.416	209	.126		
	Total	26.691	212			
Mean of Intrapersonal Intelligence	Between Groups	5.298	3	1.766	11.101	.000
	Within Groups	33.250	209	.159		
	Total	38.548	212			
Mean of Spatial/Visual Intelligence	Between Groups	.502	3	.167	.587	.624
	Within Groups	59.547	209	.285		
	Total	60.049	212			
Mean of Legislative Style	Between Groups	1.104	3	.368	1.062	.366
	Within Groups	72.414	209	.346		
	Total	73.518	212			
Mean of Executive Style	Between Groups	.839	3	.280	.835	.476
	Within Groups	70.010	209	.335		
	Total	70.850	212			
Mean of Judicial Style	Between Groups	1.904	3	.635	1.966	.120
	Within Groups	67.475	209	.323		
	Total	69.379	212			
Mean of Monarchic Style	Between Groups	.824	3	.275	.959	.413
	Within Groups	59.908	209	.287		
	Total	60.732	212			
Mean of Hierarchic Style	Between Groups	2.929	3	.976	2.440	.065
	Within Groups	83.656	209	.400		
	Total	86.585	212			

Mean of Oligarchic Style	Between Groups	3.103	3	1.034	3.359	.020
	Within Groups	64.356	209	.308		
	Total	67.460	212			
Mean of Anarchic Style	Between Groups	3.188	3	1.063	3.660	.013
	Within Groups	60.689	209	.290		
	Total	63.876	212			
Mean of Global Style	Between Groups	1.233	3	.411	1.618	.186
	Within Groups	53.066	209	.254		
	Total	54.299	212			
Mean of Local Style	Between Groups	1.563	3	.521	1.562	.200
	Within Groups	69.707	209	.334		
	Total	71.270	212			
Mean of Internal Style	Between Groups	28.667	3	9.556	18.468	.000
	Within Groups	108.140	209	.517		
	Total	136.808	212			
Mean of External Style	Between Groups	11.105	3	3.702	8.779	.000
	Within Groups	88.130	209	.422		
	Total	99.235	212			
Mean of Liberal Style	Between Groups	1.353	3	.451	1.033	.379
	Within Groups	91.249	209	.437		
	Total	92.602	212			
Mean of Conservative Style	Between Groups	.284	3	.095	.221	.882
	Within Groups	89.454	209	.428		
	Total	89.737	212			
Mean of Cognitive Strategies	Between Groups	.834	3	.278	1.565	.199
	Within Groups	37.122	209	.178		
	Total	37.955	212			
Mean of Compensation Strategies	Between Groups	.279	3	.093	.246	.864
	Within Groups	78.893	209	.377		
	Total	79.172	212			
Mean of Social Strategies	Between Groups	.507	3	.169	.376	.770
	Within Groups	93.819	209	.449		
	Total	94.326	212			
Mean of Metacognitive Strategies	Between Groups	.441	3	.147	.324	.808
	Within Groups	94.866	209	.454		
	Total	95.306	212			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) student's nationality	(J) student's nationality	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Mean of Naturalistic Intelligence	Chinese Han	Miao	.05402	.07986	.906	-.1528	.2608
		Dong	-.00538	.10263	1.000	-.2712	.2604
		Other minorities	.06919	.09039	.870	-.1649	.3033
	Miao	Chinese Han	-.05402	.07986	.906	-.2608	.1528
		Dong	-.05939	.11032	.950	-.3451	.2263
		Other minorities	.01517	.09903	.999	-.2413	.2716
	Dong	Chinese Han	.00538	.10263	1.000	-.2604	.2712
		Miao	.05939	.11032	.950	-.2263	.3451
		Other minorities	.07456	.11817	.922	-.2315	.3806
	Other minorities	Chinese Han	-.06919	.09039	.870	-.3033	.1649
		Miao	-.01517	.09903	.999	-.2716	.2413
		Dong	-.07456	.11817	.922	-.3806	.2315
Mean of Musical Intelligence	Chinese Han	Miao	.13290	.09615	.512	-.1161	.3819
		Dong	-.08339	.12357	.907	-.4034	.2366
		Other minorities	-.17657	.10883	.368	-.4584	.1053
	Miao	Chinese Han	-.13290	.09615	.512	-.3819	.1161
		Dong	-.21630	.13283	.365	-.5603	.1277
		Other minorities	-.30947*	.11924	.049	-.6183	-.0007
	Dong	Chinese Han	.08339	.12357	.907	-.2366	.4034
		Miao	.21630	.13283	.365	-.1277	.5603
		Other minorities	-.09318	.14227	.914	-.4616	.2753
	Other minorities	Chinese Han	.17657	.10883	.368	-.1053	.4584
		Miao	.30947*	.11924	.049	.0007	.6183
		Dong	.09318	.14227	.914	-.2753	.4616
Mean of Logical Intelligence	Chinese Han	Miao	.09003	.07236	.600	-.0974	.2774
		Dong	-.05341	.09300	.940	-.2943	.1874
		Other minorities	-.02767	.08191	.987	-.2398	.1844
	Miao	Chinese Han	-.09003	.07236	.600	-.2774	.0974
		Dong	-.14343	.09997	.479	-.4023	.1155
		Other minorities	-.11770	.08974	.557	-.3501	.1147
	Dong	Chinese Han	.05341	.09300	.940	-.1874	.2943
		Miao	.14343	.09997	.479	-.1155	.4023
		Other minorities	.02573	.10708	.995	-.2516	.3030

	Other minorities	Chinese Han	.02767	.08191	.987	-.1844	.2398
		Miao	.11770	.08974	.557	-.1147	.3501
		Dong	-.02573	.10708	.995	-.3030	.2516
Mean of Existential Intelligence	Chinese Han	Miao	-.05550	.08776	.921	-.2828	.1718
		Dong	-.17025	.11278	.434	-.4623	.1218
		Other minorities	-.08809	.09933	.812	-.3453	.1692
	Miao	Chinese Han	.05550	.08776	.921	-.1718	.2828
		Dong	-.11475	.12123	.780	-.4287	.1992
		Other minorities	-.03258	.10883	.991	-.3144	.2493
	Dong	Chinese Han	.17025	.11278	.434	-.1218	.4623
		Miao	.11475	.12123	.780	-.1992	.4287
		Other minorities	.08216	.12986	.921	-.2541	.4185
	Other minorities	Chinese Han	.08809	.09933	.812	-.1692	.3453
		Miao	.03258	.10883	.991	-.2493	.3144
		Dong	-.08216	.12986	.921	-.4185	.2541
Mean of Interpersonal Intelligence	Chinese Han	Miao	.20631*	.06589	.011	.0357	.3770
		Dong	.14086	.08468	.346	-.0784	.3602
		Other minorities	.10139	.07458	.526	-.0918	.2945
	Miao	Chinese Han	-.20631*	.06589	.011	-.3770	-.0357
		Dong	-.06545	.09102	.889	-.3012	.1703
		Other minorities	-.10493	.08171	.574	-.3165	.1067
	Dong	Chinese Han	-.14086	.08468	.346	-.3602	.0784
		Miao	.06545	.09102	.889	-.1703	.3012
		Other minorities	-.03947	.09750	.978	-.2920	.2130
	Other minorities	Chinese Han	-.10139	.07458	.526	-.2945	.0918
		Miao	.10493	.08171	.574	-.1067	.3165
		Dong	.03947	.09750	.978	-.2130	.2920
Mean of Bodily-kinesthetic Intelligence	Chinese Han	Miao	.05005	.10264	.962	-.2158	.3159
		Dong	-.08160	.13190	.926	-.4232	.2600
		Other minorities	-.03033	.11617	.994	-.3312	.2705
	Miao	Chinese Han	-.05005	.10264	.962	-.3159	.2158
		Dong	-.13165	.14179	.790	-.4989	.2356
		Other minorities	-.08038	.12728	.922	-.4100	.2493
	Dong	Chinese Han	.08160	.13190	.926	-.2600	.4232
		Miao	.13165	.14179	.790	-.2356	.4989
		Other minorities	.05127	.15187	.987	-.3421	.4446
	Other minorities	Chinese Han	.03033	.11617	.994	-.2705	.3312
		Miao	.08038	.12728	.922	-.2493	.4100
		Dong	-.05127	.15187	.987	-.4446	.3421

Mean of Linguistic Intelligence	Chinese Han	Miao	.03810	.06047	.922	-.1185	.1947
		Dong	.01278	.07772	.998	-.1885	.2141
		Other minorities	-.07094	.06845	.728	-.2482	.1063
	Miao	Chinese Han	-.03810	.06047	.922	-.1947	.1185
		Dong	-.02532	.08354	.990	-.2417	.1910
		Other minorities	-.10904	.07499	.467	-.3033	.0852
	Dong	Chinese Han	-.01278	.07772	.998	-.2141	.1885
		Miao	.02532	.08354	.990	-.1910	.2417
		Other minorities	-.08372	.08948	.786	-.3155	.1480
	Other minorities	Chinese Han	.07094	.06845	.728	-.1063	.2482
		Miao	.10904	.07499	.467	-.0852	.3033
		Dong	.08372	.08948	.786	-.1480	.3155
Mean of Intrapersonal Intelligence	Chinese Han	Miao	-.35517*	.06785	.000	-.5309	-.1795
		Dong	-.27180*	.08719	.011	-.4976	-.0460
		Other minorities	-.02804	.07679	.983	-.2269	.1708
	Miao	Chinese Han	.35517*	.06785	.000	.1795	.5309
		Dong	.08337	.09373	.810	-.1594	.3261
		Other minorities	.32713*	.08414	.001	.1092	.5450
	Dong	Chinese Han	.27180*	.08719	.011	.0460	.4976
		Miao	-.08337	.09373	.810	-.3261	.1594
		Other minorities	.24376	.10039	.075	-.0162	.5038
	Other minorities	Chinese Han	.02804	.07679	.983	-.1708	.2269
		Miao	-.32713*	.08414	.001	-.5450	-.1092
		Dong	-.24376	.10039	.075	-.5038	.0162
Mean of Spatial/Visual Intelligence	Chinese Han	Miao	.00854	.09080	1.000	-.2266	.2437
		Dong	-.13274	.11669	.667	-.4349	.1695
		Other minorities	-.06763	.10277	.913	-.3338	.1985
	Miao	Chinese Han	-.00854	.09080	1.000	-.2437	.2266
		Dong	-.14128	.12543	.674	-.4661	.1836
		Other minorities	-.07617	.11260	.906	-.3678	.2154
	Dong	Chinese Han	.13274	.11669	.667	-.1695	.4349
		Miao	.14128	.12543	.674	-.1836	.4661
		Other minorities	.06511	.13435	.962	-.2828	.4131
	Other minorities	Chinese Han	.06763	.10277	.913	-.1985	.3338
		Miao	.07617	.11260	.906	-.2154	.3678
		Dong	-.06511	.13435	.962	-.4131	.2828
Mean of Legislative Style	Chinese Han	Miao	-.15969	.10013	.384	-.4190	.0996
		Dong	-.14743	.12868	.662	-.4807	.1858

		Other minorities	-.11098	.11333	.761	-.4045	.1825
	Miao	Chinese Han	.15969	.10013	.384	-.0996	.4190
		Dong	.01226	.13832	1.000	-.3460	.3705
		Other minorities	.04871	.12417	.979	-.2729	.3703
	Dong	Chinese Han	.14743	.12868	.662	-.1858	.4807
		Miao	-.01226	.13832	1.000	-.3705	.3460
		Other minorities	.03645	.14816	.995	-.3472	.4202
	Other minorities	Chinese Han	.11098	.11333	.761	-.1825	.4045
		Miao	-.04871	.12417	.979	-.3703	.2729
		Dong	-.03645	.14816	.995	-.4202	.3472
Mean of Executive Style	Chinese Han	Miao	-.08063	.09845	.845	-.3356	.1743
		Dong	-.19403	.12652	.419	-.5217	.1336
		Other minorities	-.05699	.11143	.956	-.3456	.2316
	Miao	Chinese Han	.08063	.09845	.845	-.1743	.3356
		Dong	-.11340	.13600	.838	-.4656	.2388
		Other minorities	.02364	.12209	.997	-.2926	.3398
	Dong	Chinese Han	.19403	.12652	.419	-.1336	.5217
		Miao	.11340	.13600	.838	-.2388	.4656
		Other minorities	.13704	.14568	.783	-.2402	.5143
	Other minorities	Chinese Han	.05699	.11143	.956	-.2316	.3456
		Miao	-.02364	.12209	.997	-.3398	.2926
		Dong	-.13704	.14568	.783	-.5143	.2402
Mean of Judicial Style	Chinese Han	Miao	-.13048	.09665	.532	-.3808	.1198
		Dong	-.25735	.12421	.166	-.5790	.0643
		Other minorities	.02043	.10940	.998	-.2629	.3037
	Miao	Chinese Han	.13048	.09665	.532	-.1198	.3808
		Dong	-.12687	.13352	.778	-.4727	.2189
		Other minorities	.15091	.11986	.590	-.1595	.4613
	Dong	Chinese Han	.25735	.12421	.166	-.0643	.5790
		Miao	.12687	.13352	.778	-.2189	.4727
		Other minorities	.27778	.14302	.214	-.0926	.6482
	Other minorities	Chinese Han	-.02043	.10940	.998	-.3037	.2629
		Miao	-.15091	.11986	.590	-.4613	.1595
		Dong	-.27778	.14302	.214	-.6482	.0926
Mean of Monarchic Style	Chinese Han	Miao	-.11464	.09107	.590	-.3505	.1212
		Dong	-.16272	.11704	.507	-.4658	.1404
		Other minorities	-.09723	.10308	.782	-.3642	.1697
	Miao	Chinese Han	.11464	.09107	.590	-.1212	.3505

		Dong	-.04808	.12581	.981	-.3739	.2777
		Other minorities	.01742	.11294	.999	-.2751	.3099
	Dong	Chinese Han	.16272	.11704	.507	-.1404	.4658
		Miao	.04808	.12581	.981	-.2777	.3739
		Other minorities	.06550	.13476	.962	-.2835	.4145
	Other minorities	Chinese Han	.09723	.10308	.782	-.1697	.3642
		Miao	-.01742	.11294	.999	-.3099	.2751
		Dong	-.06550	.13476	.962	-.4145	.2835
Mean of Hierarchic Style	Chinese Han	Miao	-.25408	.10762	.088	-.5328	.0246
		Dong	-.26930	.13831	.212	-.6275	.0889
		Other minorities	-.12173	.12181	.750	-.4372	.1937
	Miao	Chinese Han	.25408	.10762	.088	-.0246	.5328
		Dong	-.01522	.14867	1.000	-.4002	.3698
		Other minorities	.13234	.13346	.754	-.2133	.4780
	Dong	Chinese Han	.26930	.13831	.212	-.0889	.6275
		Miao	.01522	.14867	1.000	-.3698	.4002
		Other minorities	.14756	.15924	.791	-.2648	.5600
	Other minorities	Chinese Han	.12173	.12181	.750	-.1937	.4372
		Miao	-.13234	.13346	.754	-.4780	.2133
		Dong	-.14756	.15924	.791	-.5600	.2648
Mean of Oligarchic Style	Chinese Han	Miao	-.23664	.09439	.062	-.4811	.0078
		Dong	-.26452	.12131	.132	-.5787	.0497
		Other minorities	.00566	.10684	1.000	-.2710	.2823
	Miao	Chinese Han	.23664	.09439	.062	-.0078	.4811
		Dong	-.02788	.13040	.997	-.3656	.3098
		Other minorities	.24230	.11706	.166	-.0609	.5454
	Dong	Chinese Han	.26452	.12131	.132	-.0497	.5787
		Miao	.02788	.13040	.997	-.3098	.3656
		Other minorities	.27018	.13967	.217	-.0915	.6319
	Other minorities	Chinese Han	-.00566	.10684	1.000	-.2823	.2710
		Miao	-.24230	.11706	.166	-.5454	.0609
		Dong	-.27018	.13967	.217	-.6319	.0915
Mean of Anarchic Style	Chinese Han	Miao	-.28364*	.09166	.012	-.5210	-.0462
		Dong	-.20741	.11780	.295	-.5125	.0977
		Other minorities	-.04737	.10375	.968	-.3161	.2213
	Miao	Chinese Han	.28364*	.09166	.012	.0462	.5210
		Dong	.07623	.12663	.931	-.2517	.4042
		Other minorities	.23627	.11367	.164	-.0581	.5307

	Dong	Chinese Han	.20741	.11780	.295	-.0977	.5125
		Miao	-.07623	.12663	.931	-.4042	.2517
		Other minorities	.16004	.13563	.640	-.1912	.5113
	Other minorities	Chinese Han	.04737	.10375	.968	-.2213	.3161
		Miao	-.23627	.11367	.164	-.5307	.0581
		Dong	-.16004	.13563	.640	-.5113	.1912
Mean of Global Style	Chinese Han	Miao	-.09017	.08571	.719	-.3121	.1318
		Dong	-.12330	.11015	.678	-.4086	.1620
		Other minorities	.10945	.09701	.673	-.1418	.3607
	Miao	Chinese Han	.09017	.08571	.719	-.1318	.3121
		Dong	-.03313	.11841	.992	-.3398	.2735
		Other minorities	.19962	.10629	.241	-.0757	.4749
	Dong	Chinese Han	.12330	.11015	.678	-.1620	.4086
		Miao	.03313	.11841	.992	-.2735	.3398
		Other minorities	.23275	.12683	.260	-.0957	.5612
	Other minorities	Chinese Han	-.10945	.09701	.673	-.3607	.1418
		Miao	-.19962	.10629	.241	-.4749	.0757
		Dong	-.23275	.12683	.260	-.5612	.0957
Mean of Local Style	Chinese Han	Miao	-.08903	.09824	.802	-.3434	.1654
		Dong	-.07718	.12625	.928	-.4041	.2498
		Other minorities	-.23956	.11119	.140	-.5275	.0484
	Miao	Chinese Han	.08903	.09824	.802	-.1654	.3434
		Dong	.01185	.13571	1.000	-.3396	.3633
		Other minorities	-.15053	.12182	.605	-.4660	.1650
	Dong	Chinese Han	.07718	.12625	.928	-.2498	.4041
		Miao	-.01185	.13571	1.000	-.3633	.3396
		Other minorities	-.16238	.14536	.679	-.5388	.2141
	Other minorities	Chinese Han	.23956	.11119	.140	-.0484	.5275
		Miao	.15053	.12182	.605	-.1650	.4660
		Dong	.16238	.14536	.679	-.2141	.5388
Mean of Internal Style	Chinese Han	Miao	-.47003*	.12236	.001	-.7869	-.1531
		Dong	-1.06882*	.15725	.000	-1.4761	-.6616
		Other minorities	-.01443	.13849	1.000	-.3731	.3442
	Miao	Chinese Han	.47003*	.12236	.001	.1531	.7869
		Dong	-.59879*	.16903	.003	-1.0365	-.1610
		Other minorities	.45560*	.15174	.016	.0626	.8486
	Dong	Chinese Han	1.06882*	.15725	.000	.6616	1.4761
		Miao	.59879*	.16903	.003	.1610	1.0365

		Other minorities	1.05439*	.18105	.000	.5855	1.5233
	Other minorities	Chinese Han	.01443	.13849	1.000	-.3442	.3731
		Miao	-.45560*	.15174	.016	-.8486	-.0626
		Dong	-1.05439*	.18105	.000	-1.5233	-.5855
Mean of External Style	Chinese Han	Miao	.30909*	.11046	.029	.0230	.5952
		Dong	.69630*	.14196	.000	.3287	1.0639
		Other minorities	.15263	.12502	.614	-.1712	.4764
	Miao	Chinese Han	-.30909*	.11046	.029	-.5952	-.0230
		Dong	.38721	.15259	.057	-.0080	.7824
		Other minorities	-.15646	.13698	.664	-.5112	.1983
	Dong	Chinese Han	-.69630*	.14196	.000	-1.0639	-.3287
		Miao	-.38721	.15259	.057	-.7824	.0080
		Other minorities	-.54366*	.16344	.006	-.9670	-.1204
	Other minorities	Chinese Han	-.15263	.12502	.614	-.4764	.1712
		Miao	.15646	.13698	.664	-.1983	.5112
		Dong	.54366*	.16344	.006	.1204	.9670
Mean of Liberal Style	Chinese Han	Miao	.05560	.11240	.960	-.2355	.3467
		Dong	.01075	.14445	1.000	-.3633	.3848
		Other minorities	-.18048	.12722	.489	-.5099	.1490
	Miao	Chinese Han	-.05560	.11240	.960	-.3467	.2355
		Dong	-.04485	.15527	.992	-.4470	.3573
		Other minorities	-.23608	.13938	.330	-.5971	.1249
	Dong	Chinese Han	-.01075	.14445	1.000	-.3848	.3633
		Miao	.04485	.15527	.992	-.3573	.4470
		Other minorities	-.19123	.16631	.659	-.6219	.2395
	Other minorities	Chinese Han	.18048	.12722	.489	-.1490	.5099
		Miao	.23608	.13938	.330	-.1249	.5971
		Dong	.19123	.16631	.659	-.2395	.6219
Mean of Conservative Style	Chinese Han	Miao	-.06538	.11128	.936	-.3536	.2228
		Dong	-.09797	.14302	.903	-.4684	.2724
		Other minorities	-.01590	.12596	.999	-.3421	.3103
	Miao	Chinese Han	.06538	.11128	.936	-.2228	.3536
		Dong	-.03259	.15373	.997	-.4307	.3656
		Other minorities	.04947	.13800	.984	-.3079	.4069
	Dong	Chinese Han	.09797	.14302	.903	-.2724	.4684
		Miao	.03259	.15373	.997	-.3656	.4307
		Other minorities	.08207	.16467	.959	-.3444	.5085
	Other	Chinese Han	.01590	.12596	.999	-.3103	.3421

	minorities	Miao	-.04947	.13800	.984	-.4069	.3079
		Dong	-.08207	.16467	.959	-.5085	.3444
Mean of Cognitive Strategies	Chinese Han	Miao	-.12778	.07169	.285	-.3134	.0579
		Dong	-.14855	.09213	.374	-.3871	.0901
		Other minorities	-.09721	.08114	.629	-.3074	.1129
	Miao	Chinese Han	.12778	.07169	.285	-.0579	.3134
		Dong	-.02076	.09903	.997	-.2772	.2357
		Other minorities	.03057	.08890	.986	-.1997	.2608
	Dong	Chinese Han	.14855	.09213	.374	-.0901	.3871
		Miao	.02076	.09903	.997	-.2357	.2772
		Other minorities	.05133	.10608	.963	-.2234	.3261
	Other minorities	Chinese Han	.09721	.08114	.629	-.1129	.3074
		Miao	-.03057	.08890	.986	-.2608	.1997
		Dong	-.05133	.10608	.963	-.3261	.2234
Mean of Compensation Strategies	Chinese Han	Miao	.00297	.10451	1.000	-.2677	.2736
		Dong	-.05615	.13431	.975	-.4040	.2917
		Other minorities	-.08851	.11829	.877	-.3949	.2178
	Miao	Chinese Han	-.00297	.10451	1.000	-.2736	.2677
		Dong	-.05912	.14437	.977	-.4330	.3148
		Other minorities	-.09148	.12960	.895	-.4271	.2442
	Dong	Chinese Han	.05615	.13431	.975	-.2917	.4040
		Miao	.05912	.14437	.977	-.3148	.4330
		Other minorities	-.03236	.15464	.997	-.4329	.3681
	Other minorities	Chinese Han	.08851	.11829	.877	-.2178	.3949
		Miao	.09148	.12960	.895	-.2442	.4271
		Dong	.03236	.15464	.997	-.3681	.4329
Mean of Social Strategies	Chinese Han	Miao	-.09560	.11397	.836	-.3908	.1996
		Dong	-.10335	.14647	.895	-.4827	.2760
		Other minorities	-.09847	.12900	.871	-.4325	.2356
	Miao	Chinese Han	.09560	.11397	.836	-.1996	.3908
		Dong	-.00774	.15744	1.000	-.4155	.4000
		Other minorities	-.00287	.14133	1.000	-.3689	.3632
	Dong	Chinese Han	.10335	.14647	.895	-.2760	.4827
		Miao	.00774	.15744	1.000	-.4000	.4155
		Other minorities	.00487	.16864	1.000	-.4319	.4416
	Other minorities	Chinese Han	.09847	.12900	.871	-.2356	.4325
		Miao	.00287	.14133	1.000	-.3632	.3689
		Dong	-.00487	.16864	1.000	-.4416	.4319
Mean of	Chinese Han	Miao	-.09568	.11460	.838	-.3925	.2011

Metacognitive Strategies	Dong	Chinese Han	-.10538	.14728	.891	-.4868	.2761
		Other minorities	-.06678	.12971	.955	-.4027	.2692
	Miao	Chinese Han	.09568	.11460	.838	-.2011	.3925
		Dong	-.00970	.15832	1.000	-.4197	.4003
		Other minorities	.02890	.14212	.997	-.3392	.3970
	Dong	Chinese Han	.10538	.14728	.891	-.2761	.4868
		Miao	.00970	.15832	1.000	-.4003	.4197
		Other minorities	.03860	.16958	.996	-.4006	.4778
	Other minorities	Chinese Han	.06678	.12971	.955	-.2692	.4027
		Miao	-.02890	.14212	.997	-.3970	.3392
		Dong	-.03860	.16958	.996	-.4778	.4006

*. The mean difference is significant at the 0.05 level.



CURRICULUM VITAE

Sixiang Peng was born in Sansui, Guizhou province, China. He graduated from Kaili Teachers' College, the former name of Kaili University, in 1994. He studied Japanese at Beijing Language University from 1993 to 1995. He studied English at Guizhou Educational College from 1995 to 1997. He was a visiting scholar at the School of Foreign Languages in Sichuan Normal University from 1999-2000. He received a Master of Arts degree in English Language Studies from Suranaree University of Technology, Thailand, in 2009.

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